

**School of Built Environment, Department of Urban and Regional
Planning**

**Environmental Policy Making in Highly Contested Contexts:
The success of adaptive–collaborative approaches**

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Declaration

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgment has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

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Abstract

This thesis examines the successes and failures of different approaches to environmental policy making in contexts where the level of conflict are significant, both in intensity and complexity. In this thesis the term policy making is used to cover three elements: the way that a policy is formulated, the decision making process to select the policy *instruments*, and the nature of the policy instruments used or proposed to be used. The research question here is “what policy making approach is most likely to succeed in highly contested contexts where levels of conflict are significant, both in intensity and complexity?” This research is built on the key proposition that some policy making approaches are, by their nature, better suited to highly contested contexts than others.

The communicative/deliberative turn in planning was the starting theoretical framework for understanding how policy making can be carried out in highly contested contexts. It was argued that this framework has great value in understanding the processes involved in dealing with conflict, but that there are shortcomings. In particular, conflict is seen largely as a social problem, but conflict in environmental policy making often involves so-called wicked problems, where the conflict is deeper, more complex and involving longer timeframes than most planning conflicts. This thesis constructs a framework that describes the nature of conflict, with three broad themes being defined: social, governance, and science and information. It is argued that conflict is most likely where the resources at the centre of the conflict are scarce.

Three types of scarcity are identified — decreasing *quantity* of a resource, increasing *demand* on a resource, and reducing *quality* of a resource.

Four broad policy making approaches are defined:

- The traditional expert-driven approach — a highly centralised approach dominated by the expert regulators using predominately science-based technical and statutory policy mechanisms;
- The ecological modern approach — a more participative but still largely science-based approach, favouring the use of either market-based or voluntary policy mechanisms;
- The collaborative approach — a highly participative form of policy making that does not necessarily favour a particular type of policy mechanism; and
- The adaptive–collaborative approach — a special case of collaborative policy making where adaptive management measures are adopted to deal with the uncertainty of the science and information.

These four approaches are analysed for their likely capacity to be successful in contexts where conflict is significant, and it is proposed that the first two are unlikely to be successful, whereas the two collaborative approaches, especially the adaptive–collaborative approach, would be successful where all the types of conflict are present.

A qualitative multiple case study methodology was adopted to address the research question and to test the finding of the literature review, focusing primarily on the policy making of Western Australian (WA) Environmental Protection Authority (EPA - the peak environmental agency in WA). A specific methodology to determine policy making success or failure (evaluation) has been developed and applied in this study, involving the use of four evaluation criteria.

The review of policy making by the EPA showed that whilst its policy making in cases where conflict was low were successful, it failed in cases where conflict was significant. It was noted that in all cases the policy making approaches adopted were either traditional expert–driven or ecological modern and not either of the two collaborative approaches, which, it was noted, was consistent with the finding of the literature review and would explain the policy failures in cases where conflict was significant.

It was argued that recent policy making of the EPA shows some promise in dealing with conflict. This was because it has developed its Environmental Protection Policies (EPPs) more collaboratively, involving an additional complementary policy: the EPP sets high level objectives and deals with specific non–negotiable issues; and the more prescriptive *implementation* policy contains the detailed policy and management measures that would achieve the objectives in the EPP. These are called concurrent–complementary policies.

A key part of this thesis is an in–depth analysis of a particular policy making exercise (major case study) set in a context where the three elements of conflict were significant, and the three resource scarcity types were present. The case study was Cockburn Sound, a large marine embayment approximately 20 kms south of Perth. Two concurrent–complementary policies were developed, and it was shown that the policy making approach of the implementation policy was adaptive–collaborative, and it was evaluated as being successful on all the four criteria. It was also noted that the draft EPP was a traditional expert–driven policy approach (although with a much improved level of participation) and that, it was evaluated as being unsuccessful on two of the four criteria — performance effectiveness and political support.

The thesis concludes with a discussion of the broader implications for environmental policy making that can be drawn from this work, notably: that five policy making scenarios can be identified based on the nature and extent of conflict present, and recommendations made as to which policy making approach should be applied in each scenario.

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Chapter 1 — Introduction

'Look at Mother Nature on the run in the nineteen seventies' —
After the Gold Rush, Neil Young

Much has happened in the field of environmental planning since the 1960s and 1970s when environmentalism became a catalyst for social change. The links between urban and regional planning (here after referred to as planning) and environmental protection, arguably have its roots in era as well: for example, Garrett Hardin's seminal 1968 essay *Tragedy of the Commons* (Hardin 1968) can be interpreted as a failure of the planning system to prevent environmental degradation and subsequent social impacts. Two aspects of this social change are of particular interest in this thesis: the ongoing and often deepening conflict surrounding many aspects of the environmental debate, and the increased involvement of governments in regulating and controlling the environmental, in particular, the use of policy. The specific research question examined here is: "what policy making approach is most likely to succeed in highly contested contexts where levels of conflict are significant, both in intensity and complexity?"

Scope of policies to be studied

Governments throughout the developed world responded to growing community awareness about environmental problems by adopting an increasing number of environmental laws (Esty and Mendelsohn 1998). Australia was not immune to this trend with the number of pieces of environment-related legislation increasing from 130 to 500 between 1980 and 1992 (Conacher and Conacher 2000:130). Parallel with this has been the growth in the use of policies to deal with specific issues that legislation cannot adequately cover and to provide governments and agencies with highly flexible and responsive approaches to the environmental protection (Fisher 2000:499).

This study focuses on a particular level and type of environmental policy: the policies of government environmental agencies. Nakamura and Smallwood (Cited in Rist 1995) define policy at this level as "a set of instructions from policy makers to policy implementers that spell out both goals and the means of achieving those goals" (P. xviii). Government agency policies can be considered, therefore, sets of rules that decision makers should follow in the on-going management of the particular issue.

Policy making

This thesis will go beyond an examination of environmental policies (the sets of rules) and will examine policy *making*. Policy making is not well defined in the literature. For example, whilst Lindblom and Woodhouse (1993) note that one way to examine policy making is to see it as a series of distinct steps, it rarely is this simple in practice and policy making can be “described more accurately as resembling a ‘primeval soup’” (p. 10). In this thesis policy making is used to cover three areas or elements:

- The way that a policy is formulated,
- The decision making process to select the policy *instruments*, and
- The nature of the policy instruments used or proposed to be used.

This puts the emphasis of this study on policy formulation more than policy implementation. This emphasis also allows certain draft policies to be included, as will be further explained below.

Policy instruments or mechanisms are the specific measures of a policy which are applied during the implementation phase to deliver the desired environmental outcomes. These can include specific regulations, subsidies, taxes, covenants, voluntary agreements, education programmes and zoning of land. The mechanisms chosen can depend on the overall philosophy adopted by the policy makers: for example, agencies with a deregulation or free market philosophy would favour the use of emissions trading and tax concessions over regulations (Jimenez 2007).

Environmental policy making, planning

Whilst Hardin’s Tragedy of the Commons was about the “population problem” and its impacts (Hardin 1968:1243), his notion of what is a commons and ways of finding solutions to the potential tragedies has links to both planning and environmental protection. For example, Hardin argues that pollution of waterways, public land and the air occurs because private land owners calculate that it is cheaper to discharge to the commons than to treat the pollution at the source. Regulation through land use controls and recognition of the public values of these commons is one way to avoid such tragedies and bring about more sustainable industry practices. These tensions between private benefit and public good are fundamental to planning. When those tensions are over environmental resources, policy contested spaces are created where planning and environmental protection compete for jurisdiction. Many of the policies covered in this thesis cover this contested policy making space, and, whilst environmental agencies have jurisdiction over some of this space, much if it belongs to planning. Inevitably, planning agencies will need to produce their own policies to guide decision making within the planning process.

Research questions, research significance and theoretical framework

As noted above, the research question examined here is: “what policy making approach is most likely to succeed in highly contested contexts where levels of conflict are significant, both in intensity and complexity?” Implicit in this question is that some policy making approaches are more likely to succeed in highly contested contexts than others. Secondary research questions that arise from the primary question are:

1. *What are the dimensions of conflict in environmental policy making?*
2. *What are the broad types of environmental policy making?*
3. *How is policy making success (evaluation) determined?*
4. *How well is policy evaluation understood and carried out in WA?*
5. *What are the barriers to using the policy making approach most likely to succeed in highly contested contexts, both from the environmental and the planning agencies?*
6. *What do the policy stakeholders see as being the key elements of good policy making?*

This research brings together three areas of study: policy making in highly contested contexts; collaborative policy making; and, adaptive policy solutions. The rise of collaborative policy making is, in part, a direct outcome of the rise in conflict that surrounds many modern policy making efforts. Existing analysis of collaborative policy making in the literature focuses on ways to manage that conflict rather than examining the nature of that conflict itself. This is a significant gap in the literature. This research will contribute to the understanding of both conflict in policy making and the collaborative approach by providing a theoretical framework within which to understand conflict (Chapter 2).

Any thesis that examines modern conflict in decision making will draw its theoretical framework from writers in the communicative and participative planning fields, notably Healey (1997) and Forester (1999). Healey (1998) notes of these new ideas in planning theory:

... that, through such a process of 'learning how to collaborate', a richer understanding and awareness of conflicts over local environments can develop, from which collective approaches to resolving conflicts may emerge.

(Healey 1998:34)

It will be argued here that collaboration alone will not deliver good policy making in all cases where conflict is deeply embedded as part of the process, notably where the conflict is in part centred on the science that supports decision making: that is, where there is a high level of uncertainty in the science. There has been considerable interest in the recent environmental *management* literature of the potential for adaptive management to be successful in circumstances where data is limited but there is considerable development pressure. Adaptive management is more flexible than traditional approaches and involves monitoring environmental performance and then altering or adapting management responses depending on the results of that monitoring. It is applied in cases where there is some uncertainty about how a certain environment will respond to change.

Keen et al (2005) argue that adaptive management has part of its theoretical basis in social learning literature. They define adaptive management as “process of iterative reflection that occurs when we share our experiences, ideas and environments with others” (P.9)

Lessard (1998) argues that adaptive management involves both social and technical learning where all stakeholders, including the general public, “learn more about the social, biological, and physical attributes of ecosystems and adapt more quickly to new knowledge” (P. 87)

Policy making where a collaborative process is combined with adaptive management and policy measures (in this thesis called an *adaptive–collaborative* approach) will be given special attention. The adaptive–collaborative approach has its theoretical roots in both the participative planning and policy literature (collaborative) and the social learning literature (adaptive). It is participative in how policy is formulated and requires that flexible policy mechanisms be applied so that as both technical and social learning occurs throughout the process, policy can be adapted in the light of this learning.

Whilst there has been considerable research and academic discussion of both the collaborative process and adaptive management, little work and analysis has been done on how these two work together as an adaptive–collaborative policy making approach, and specifically how this approach can deal with deeply embedded conflict. This research addresses this gap in research literature, and should be of interest to policy makers, the community and planners involved in environmental policy making approaches in these contested contexts. This thesis will examine this issue by studying case studies of environmental policies in WA in detail.

The theoretical context for this study will examine two separate questions central to this thesis:

1. *What are the dimensions of conflict in environmental policy making?*
2. *What are the broad types of environmental policy making?*

As already noted, one of the weaknesses of the literature on collaborative planning and environmental policy making is that it focuses on the processes of collaboration rather than the nature and extent of conflict. This thesis addresses this gap by exploring the dimensions of conflict and establishes a theoretical model of conflict in environmental policy making based on an analysis of the relevant literature. As well, four broad approaches to environmental policy making will be identified, described and analysed for their potential to deal with conflict.

Overview of research design

To answer the research question posed here, real examples of the four policy making approaches will be examined, particularly where levels of conflict are high, and policy success/failure determined. There are two broad approaches of comparing policy making: a quantitative approach, where many environmental policy making efforts are reviewed and evaluated against specific criteria; or, a primarily qualitative method, where a limited number of policy making efforts are examined in detail. A qualitative case study approach was deliberately chosen here to allow for in–depth coverage of issues which resulted in the inevitable trade–off of a lack of precision.

This case study approach has two layers. As noted earlier, environmental policies can be applied to a wide range of subjects across different levels of governance. Rather than study environmental policy making across all levels of governance, a single level was chosen as the first layer of case study: government agency policy making at the sub–national level. In this case, the policy making of the WA Environmental Protection Authority (EPA) and the Western Australian Planning Commission (WAPC) are examined with the policy making of the EPA given particular attention (the EPA is the peak environmental agency in WA). Second, a single recent case study of policy making in a highly contested context is examined where two quite different policy making approaches were used, one of which has elements of the adaptive–collaborative approach and the other a more traditional expert centred less participative approach.

The advantage of focusing on a single policy making level is that it allows deeper themes in policy making to be examined than a more quantitative approach would not necessarily allow. For example:

- Is there a pattern of policy success/failure and what could account for this?
- Is there a preference for a particular approach to policy making and why would policy makers favour certain approaches over others?
- What is the nature of the debate within the environmental policy making community in WA?

This takes us to a key methodological question (the third secondary question raised above): how is policy making success (evaluation) determined? The evaluation method used here was developed using a two-stepped process. A draft method was arrived at based on a review of the policy evaluation literature. This was tested and fine tuned by seeking the views of key experts on environmental policy in WA.

For the most part this research used qualitative data: a combination of semi-structured interviews, document reviews, phone interviews, meeting notes and file searches. Published quantitative data is used where appropriate. Chapter 3 gives the full description of the methodology used.

Environmental policies covered

Overview

The policies examined in this study are the high level policies of the EPA and the environmental strategies and policies of the WAPC, the peak land use planning agency in WA. These agencies were chosen because their environmental policies cover the full range of environmental issues, whereas the other government agencies focus on specific elements of the environment (water resources, conservation, agriculture etc.). As this thesis unfolds, more and more emphasis will be given to the EPA's policies. This was done to limit the number of policies covered in detail so as to provide greater opportunity for more in-depth analysis.

EPA policies

The EPA makes both statutory and non-statutory policies. The statutory policies are Environment Protection Policies (EPPs). EPPs are developed under Part III of the *Environmental Protection Act (1986)* and are, as noted by the EPA (2004), “whole-of-government policies which are ratified by Parliament and have the force of law as if part of the Act” (P. 4). The first EPP was produced in 1992, and at the time of writing there were nine finalised EPPs and three more in draft stage. The EPA also produces a range of non-statutory policies, notably State Environmental Policies (SEPs), Position Statements and Guidance Statements. For the purpose of this thesis, only the statutory EPPs and the SEPs will be referred to.

Draft EPPs and SEPs

One interesting aspect of EPA's policy making is that EPPs and SEPs that are in draft form only but are released for public comment have significant impacts on the decision making of other government agencies. This is in part due to the strong legislative nature of EPPs, giving draft EPPs a certain status within government; but also relates to the strong relationship between these draft policies and formal environmental impact assessment (EIA) of major proposals carried out by the EPA. EIA is a powerful statutory tool in its own right and the EPA will often use EIA in support of draft EPPs. As well, draft EPPs often emerge to address a specific problem that is commonly raised through project EIA. In these cases, the issues covered in draft EPPs already have some level of EPA and government support. For these reasons, the policy making of certain draft EPPs will be covered here.

WAPC policies

The WAPC produces a wide range of policy-type documents including statutory State Planning Policies (SPPs) and numerous non-statutory policies. SPPs are prepared under Part 3 of the *Planning and Development Act 2005*. Both the WAPC and local government are required to amend their Planning Schemes to be consistent with Gazetted SPPs and to subsequently make planning decisions consistent with SPPs. At the time of writing this thesis there were 18 Gazetted SPPs and a further five in preparation. Of these only five cover topics that have direct environmental relevance.

The WAPC has a range of operational Development Control Policies that establish general principles that will be used by WAPC in its decision making (WAPC 2004:4). There are 40 Development Control Policies.

There are 25 Regional Strategies that allows the WAPC (1999) to "provide the basis for co-operative action to be taken by State and local government on land use and development" (P. 10). There are also 25 Regional and Sub-Regional Structure plans that provide more comprehensive planning in areas subject to significant growth pressures. Many of the Regional Strategies and Regional and Sub-regional Structure plans cover environmentally significant areas in the State. The WAPC also has developed 18 Strategic Policies that deal with specific strategic planning issues or give detailed meaning to an aspect of a regional strategy. For the purpose of this thesis, only the statutory SPPs and the high level non-statutory policies, Regional Strategies and Regional and Sub-regional Structure plans that cover environmentally significant areas in the State, will be referred to.

Thesis structure

Chapter 2 establishes the overall theoretical framework for this study, where the nature and extent of conflict in modern environmental policy making, and broad approaches to environmental policy making are discussed. The key theoretical framework for this discussion draws from the communicative/participative planning field and the social learning literature. Chapter 3 describes the research methodology.

Chapter 4 examines how policy success can be determined, particularly where the policy making context is highly contested, with an emphasis on WA. Chapter 5 examines WA environmental policy making over the last twenty years to identify those that have clearly succeeded or failed, and what factors led to that success or failure. Consistent with the focus of this thesis, particular attention is given to policy making that has been formulated within a highly contested context. The methodology proposed in Chapter 4 is applied to evaluate those policies. Conclusions about the usefulness of the general approaches to environmental policy making (identified in Chapter 2) to address highly contested contexts will be drawn, based on the WA experiences. As well, based on the outcomes of the policy making evaluations, some general comments about EPA policy making will be made.

Chapter 6 explores a recent policy making case study set in a highly contested context: Cockburn Sound. Chapter 7 concludes the study by discussing the broader implications of the results of this study beyond the WA context.

Chapter 2 — Theoretical context

Introduction – planning theory

“After years of stalemate and frustration, the state’s water management bureau held a public meeting to discuss the idea of irrigators voluntarily leasing some of their water to maintain instream flows. Most of the folks in the crowd that showed up clearly opposed the proposal, many of them shouting protests before the meeting even started. Standing in front of the mob, the water bureau chief asked for a chance to have a civil dialogue. ‘I hope we’ve moved forward from the days of vigilante justice’, he said. ‘You know, the first murder in Montana happened in a dispute over water’. The crowd quieted slightly. Then, from the back of the room, a gruff voice boomed out: ‘And before tonight’s over, there’s gonna be a few more’. Welcome to the Wild West.”

(McKinney and Harmon 2007:2)

This is a quote from a paper discussing the difficulties of water management planning in Montana in the USA where conflict over the use of the resource has reached extreme levels. Whilst not this intense, modern planning and policy making is becoming more and more difficult as communities and stakeholders compete to be heard and to have their interests taken into account by decision makers. Theorists like Stilwell (1993) see conflict in urban areas originating because of tensions within the broader political-economic realm caused by disputes within production (capital-labour), inequalities in distribution (race, gender and location) and problems of exchange (externalities, monopolies etc.) where urban conflict and protests have “posed significant challenges to the economic interests of capital and the legitimacy of the state” (P. 230).

Healey (1997:5) sees conflict within the planning domain as a problem of the democratic and governance processes where planners need “new ways of understanding with which to grasp the dynamics of urban and regional change and new ways of thinking about the institutional design of governance.”

Healey argues that a communicative approach to planning is required that encourages collaborative decision making through consensus building. The traditional approaches to planning are either rational, where the information and processes of planning are seen as value free and objective, or neo-liberal where the role of planning is to facilitate the proper function of market based mechanisms. Communicative planning, on the other hand, sees knowledge as intrinsically socially constructed. Conflict arises because people of differing interests and expectations interpret knowledge in their own socially constructed ways and because power is unevenly distributed (Healey 1997:29). Advocates of more participative approaches to planning acknowledge the problems inherent in carrying out a participation

exercise, for example access to resources and information, and inequalities of power. Forester (2006) is another advocate for more participative planning and acknowledges that such approaches can be “messy, unpredictable, and uncertain” (P. 448). However, this more participative approach is able to manage and reduce conflict and deliver an equitable planning outcome: as Healey (1999) noted in more recent work on the resurgence of regional strategic planning in Europe:

Such endeavours commonly accept the need to engage with a dynamic, fluid and open relational diversity and build some kind of collective actor consciousness and mobilization force to enlarge the synergies, reduce the conflicts and turn coexistence into some kind of identification with the place of the urban region.

(Healey 1999:541)

In order to manage this conflict planners need to develop new skills and approaches including listening, mediating and negotiating. If these new skill aren't developed Forester (1994:154) argues that conflict will remain unresolved and “planners will seek refuge in expertise and bureaucratic inaccessibility”

Communicative environmental policy making

The communicative turn in planning has its parallels in environmental policy making (Steelman and Ascher 1997; van den Hove 2000; Wagle 2000) where “... a ‘new’ discourse is (re-) entering public policy and management ...” (Adams and Hess 2001:13). Forester (1999, 1994) argues that the role of decision makers has to change. Forester (1994) claims that planners

... may also come to understand their roles in new ways: to see themselves as not unappreciated scapegoats, distrusted and resented by irate neighbors or developers, but as active facilitators and mediators of public voice; not just as narrow technicians but as technically competent professionals able to listen to conflicting views, mediate between interdependent parties, and negotiate to protect various public interests as well.

(Forester 1994:155)

Proponents of greater participation usually argue their case from three broad perspectives: normative, substantive and instrumental (Stirling 2006:96). The normative argument is that greater participation is central to making governments more democratic (Pratchett 1999; Weeks 2000). For example Patten (2001) suggests that:

Working through the crux of the democratic challenge requires that we focus on opening up and democratizing policy formation within the executive branch of government. Moreover we must recognise that this can be best accomplished via a renewed (and transformed) commitment to democratic consultations and, very

importantly, the democratization of those aspects of public administration that facilitate societal input into public policy making.

(Patten 2001:222)

The substantive argument is that participation leads to better decision making because certain information relevant to the policy is held within the non policy making community and is not usually available to policy makers. Engaging the community will uncover this information, leading to a more relevant and appropriate policy. The instrumental argument is that participation gives more credibility to the final policy outcomes leading to a higher level of compliance, and will have the added benefit of increasing the credibility of the policy making agency.

A fourth argument is what can be called valuative where participation ensures that the final decision making represents the different views, values and interests of the community (Hampton 1999). Renn (2006:35) argues that policy making goes beyond considerations of the technical issues, as this is “not a sufficient condition to make prudent environmental decisions. Without consideration of public values and preferences, decisions cannot be legitimised”.

Participative ladders

Participative ladders have been developed to make better sense of this participative turn, the most notable of which is Arnstein’s (1969) work which was later adapted by Healey (1997), as shown in Table 1 below.

Table 1: Healey’s modified participative table (Source: Healey 1997:26)

8	Citizen control	Degrees of citizen power	Control over decisions and agenda
7	Delegated Power		Delegated decision making
6	Partnership		Shared decision making
5	Placation	Degrees of tokenism	Consultation with on-going efforts made to deal with concerns
4	Consultation		Seeking input on proposals
3	Informing		Providing information on proposals
2	Therapy	Non participation	Dealing with concerns after decision making
1	Manipulation		Deliberately working to change the public view on a problem

Another more recent ladder or spectrum is that developed by the International Association for Public Participation (IAP2) that builds on the work of Arnstein and Healey. It has five levels, as shown in Table 2 below.

Table 2: IAP2's participation spectrum (Source: International Association for Public Participation 2007)

Participation level	Aim of participation	Input into policy making	Follow up
Empower	Policy makers give all decision making to the public.	The public completely controls the policy making.	Policy is as decided by the public.
Collaborate	Policy makers work directly with the public through a partnership approach to ensure that views are incorporated into all parts of the policy making process.	Alternatives developed jointly and the views and recommendations of the public are included to the maximum extent possible.	On-going involvement of the public. Where views of the public are not included the reasons are communicated to the public.
Involve	Work more directly and continuously with the public to ensure their views are understood and taken account of during the process. Policy makers and public work separately.	Participation happens earlier in the policy making process and input is used to help the policy makers develop options. Final policy decision made by policy makers in isolation.	Alternatives developed by the policy makers and interim decisions made that reflect the policy makers' understanding of community views.
Consult	The policy makers carry out analysis and formulate alternatives with out public input then seek public views on these before a final decision is made.	This public process commences after considerable work already done. Views will be considered and there is some flexibility to incorporate limited changes to the preferred option.	The public is kept up-to date on progress being made, and some effort is made to accommodate their views before the final decision.
Inform	The policy makers give the public balanced information to help in the understanding of the problem, alternatives, opportunities and solutions. It is a one-way flow of information.	There is no expectation that the policy would be influenced by public views, and the informing usually takes place after considerable progress has been made in developing the policy.	This can be a once-off process or it can be on-going where the public is kept up-to-date on progress being made.

The descriptions given in the Table are made directly relevant to policy making. The IAP2 spectrum will be used here because its fewer levels are readily applicable to the policy making approaches discussed in this thesis. The first three levels of participation (Inform, Consult and Involve), are different from the other two higher levels in that decision making is centralised with the policy makers for these levels, whereas for Collaborate and Empower decision making is either shared (Collaborate) or delegated completely (Empower). This is not to say that public input doesn't affect decision making for these three lower levels, for as Zurita (2006) notes of these levels of participation:

It is important to integrate participatory processes in policy-making as a way of providing input to better informed decisions, because the knowledge and the values of the public are included in the decision process. Those decisions are also more

robust, and more likely to be accepted as legitimate by society as such. But the final decision is still in the hands of the policy-makers and based on many other factors.

(Zurita 2006:24)

Whilst there are few examples of the actual Empower level of participation, the concept is quite straight forward in that either the statutory responsibility for decision making is formally delegated to a group representing the community and stakeholders, or a formal promise is made by the decision makers to adopt the outcomes agreed by the group. Shared decision making as part of the Collaborate level of participation is, however, more complex.

Shared decision making as part of Collaborate level of participation

Collaborations do not generally involve policy makers formally sharing decision making with the public, it is usually an *implied* sharing of decision making. Three key elements are normally needed for this to occur. The first element is that participation should occur very early on in the policy making process to, as McKinney and Harmon (2007) argue:

... name problems, frame a set of solutions, take actions, and achieve desired outcomes, rather than limit participation to prescribed steps in an official decision-making process. Citizens and stakeholders bring valuable information, ideas, and insights to the table that need to be integrated with the knowledge and authority of experts and official decision-makers.

(McKinney and Harmon 2007:9)

This early engagement builds a level of confidence in the public that decisions have not already been made. The second element is that participants develop a level of trust that their views will be listened to and acted on. As McKinney and Harmon (2007) note, participants are “empowered by the presumption that their input and advice will be considered by the decision-makers and will influence the outcome” (P. 10). This trust is enhanced where the policy making agency is publicly committed to the process and its outcomes, and the process has political support (Beierle and Konisky 2000; Todd 2002).

The final element is that the participation process facilitates the open sharing of information and values, and that learning, particularly social, occurs and is seen to occur (Tippett et al. 2005; Webler, Kastenholz, and Renn 1995; Diduck 1999). Poncelet (2001) observed that social learning in collaborative exercises leads to personal transformations that

... provide important opportunities to forward environmental problem-solving efforts and to overcome some of the entrenched conflicts that have handicapped environmental decision making in the past. Though seemingly small, these personal

transformations may well serve as the foundation for future large-scale improvements in the domain of environmental management.

(Poncelet 2001:297)

Shared decision making in collaborations is, therefore, *implied* rather than actual, and occurs because participation begins early in the process, the decision makers are committed to the process, the process has political support, participants trust that decision makers will take into account the outcomes of the participation exercise, and all participants experience and observe in others some degree of social learning (transformation occurs).

The differences between the three lower levels and the Collaborate level can be best summarised in terms of the distance between policy makers and the public. For the three lower levels, policy makers engage the public to varying degrees, but a clear boundary exists between the two when it comes to making key decisions. At the Involve level, whilst policy makers are more likely to include the views of the public in the policy, it remains the call of the policy makers as to what to include and to interpret what is the public view. At the Collaborate level the implied decision making effectively blurs the decision making boundary and the distance between policy makers and the public, in effect, does not exist.

Shortcomings of the communicative approach

This participative turn in both planning and environmental policy making has not occurred without criticism, with some authors expressing concern about the ability of some groups to be involved in decision making and the likelihood that the outcome of a participative exercise may not fairly represent the full range of community views (Beatley, Brower, and Lucy 1994; Williams 2003; Illsley 2003), whilst others are concerned that there is little, if any, evidence about the overall effectiveness and cost effectiveness of greater public involvement in natural resource management (Buchy and Race 2001). Eder (1996:203) raises another concern in that in some cases, greater participation may not be primarily about having inputs into decision making but rather it has become “a discursive medium for political conflicts and public debate”. Sandercock (1983:78), whilst acknowledging the advantages of participative approaches to planning, argues that it is best suited to local planning and that “in the context of the debate about the role of the Commonwealth in the cities, notions of participation are, at best, marginal and at worst, irrelevant”.

Of more concern is the cursory way that advocates of the communicative and collaborative approaches deal with conflict. The key focus of this work is on the processes of participation and collaboration and the nature and extent of conflict that surround the planning and policy making exercises is given far less attention. Typically, as noted earlier, conflict is seen in largely social terms as being about competing interests and values. Forster (1999:14) sees managing conflicting values as the key challenge for planning where “as communities, our values conflict and cannot be realized” and asks that planning achieve “political plurality –

our caring about values” and that Information and knowledge, key inputs into the planning and policy making processes, are seen as socially constructed, with conflicting interpretations of their meanings.

This solely social view of conflict is inadequate when dealing with environmental policy making where the conflict can be deeper, more complex and occur over much longer timeframes than many planning problems. As well, environmental policy making has added complexity as it often requires various levels of government to cooperate to achieve environmental improvements. Many modern environmental issues do not recognise national boundaries (are trans-boundary), for example protection of migratory species (cetaceans and birds) and air pollution, and to adequately address these issues national governments are required to work together. Climate change not only requires a global response with national governments working cooperatively, it also involves government across different levels within a nation to work together. Where international cooperation is limited or absent conflict inevitable emerges where, as Held (1997:310) argues, governments “assert themselves nationally to protect their own interests” at the expense of achieving longer term environmental gains.

So-called wicked problems emerge that typically involve deeply entrenched conflict that has often developed over a long period of time. McKinney and Harmon (2007) describe three types of natural resource management issues from least to most tractable, being:

- Technical and practical problems where there is good and reliable information on the issue, there is good agreement on the nature of the problem, and alternatives for addressing the problem are relatively easy to identify and agree on.
- Single dimensional value-laden problems where there is agreement on the basic nature of the problem but there is disagreement on how best to address the problem based on different values different stakeholders place on the resource.
- Two dimensional value-laden problems where there are value-based disagreements on both the nature of the problem and how to resolve it.

Central to conflict on the third and intractable (wicked) problems are: differences and dispute over the interests that stakeholders have in the resources; that the information available for decision makers is complex and confounding; and, that, as McKinney and Harmon (2007:5) argue, the problems “occur in a briar patch of governmental jurisdictions with overlapping and conflicting mandates, laws, policies, and decision-making protocols”.

Clearly, the communicative/collaborative literature has some important shortcomings in the way conflict is described and dealt with. To get a better understanding of how best to deal with conflict as part of environmental policy making it is first important to understand the nature and extent of that conflict. Unfortunately, whilst there has been considerable work examining conflict within general government policy making and decision making, there is limited research specifically on conflict and *environmental* policy making. Wall and Callister

(1995:515) claim the literature on conflict and general policy making to be “mountainous”. Whilst the interest in conflict in environmental policy making has increased in recent years (Vira 2001), a framework suitable for this thesis does not exist and it is necessary, therefore, to establish an appropriate theoretical framework for the policy analysis in this thesis, which is the purpose of this part of the section.

Model of conflict and environmental policy making – three themes and one driver

Introduction

With some exceptions, this recent interest in conflict and environmental policy making has tended to focus on how policy making should address and manage conflict with little examination of the nature and extent of the conflict itself, with some exceptions (for example Chandrasekharan 1996; Schmitz 2002). The rise of collaborative and cooperative policy making is, in part, a direct outcome of this interest in conflict. Authors advocating collaborative and cooperative policy making typically take the presence of conflict as a given and then describe, often through case studies, how these exercises have contained the conflict so as to arrive at some agreed policy position. Some even avoid the use of the word conflict and prefer to talk about dilemmas instead (Heikkila and Gerlak 2005; Margerum and Whitall 2004).

Another stream of research into conflict and environmental policy making has involved the rise of alternative dispute resolution (ADR) processes to aid decision making; including mediation, facilitation, consensus building conferences, negotiation and the use of computer multiple criteria analysis models (Cowell 2000; Andrew 2001; Rauschmayer and Wittmer 2006; Regan, Colyvan et al. 2006; Striegnitz 2006; Zurita 2006; Pollino, White et al. 2007).

One useful piece of work on the extent of conflict in environmental policy making was done by Jackson and Pradubraj (2004), who identify four key features of environmental conflict:

- Conflict is a result of scarcity and represents social struggles against uneven usage and allocation of resources;
- Conflict reflects poor performance by governments in developing complex public policy;
- Conflict involves the issues of power and rights; and
- Conflict is an inevitable consequence of development and can be constructive.

This McKinney and Harmon (2007) work on wicked problems was referred to above, and is a useful starting point here. This thesis applies the McKinney and Harmon (2007) work, with some modification, to identify three broad conflict *themes* and one overall *driver*. The broad

themes are: social, governance, and science and information. The overall driver is resource scarcity.

Whilst the discussion below will show that the boundaries between these three themes can be blurred at times, this categorisation is useful for discussion purposes. As will be seen, the social themes have always been a part of environmental policy making, but modern policy making involves a significant deepening of the social theme and the emergence of the governance and science and information themes. These themes will be discussed in more detail below followed by a discussion of the key driver of conflict: resource scarcity.

The social theme

Many of the authors who have engaged in what Ebbin (2004:72) calls “the anatomy of conflict” identify the principle causes of conflict in environmental policy making as being between different groups and individuals who have different interests in the environment. This is expressed as the various stakeholders either holding different values towards the environment or different goals for its use (Shields, Tolwinski, and Kentc 1999; Vira 2001; Patterson, Montag, and Williams 2003; Ebbin 2004; Yasmi, Schanz, and Salim 2006).

This focus on interests, values and goals highlights the social aspects of conflict. For example, Vira (2001) argues that conflict arises because

... stakeholders have divergent interests and claims upon the environment but also, more fundamentally, because of differing views about what is socially desirable. An environmental dispute may reflect elemental differences in ideas about moral commitments, the more general relationship between humans and nature, and what it means to lead ‘the good life’.

(Vira 2001:637)

Fisheries management well illustrates how these different social claims generate conflict with commercial users expressing an economic interest, non-commercial fishers expressing a recreational interest and traditional (indigenous) users expressing cultural interests (Claytor 2000). Conflict centres on the allocation of the total sustainable take and how much each group of users are entitled to. The commercial fishers typically claim that because they supply the food needs of the whole population their needs should take precedence over individual recreational users. Indigenous groups usually have a lower demand on the total resource but because of the cultural and often spiritual connections to fishing, their claims are based on more deeply-held views about access rights. Problems and conflict with fishery and wildlife managers can emerge when the species of interest to indigenous people is severely depleted and already over-fished, as is the case with Dugongs in some places in Australia. According to the Australian Department of Environment and Heritage Dugongs are not only important food sources for some remote communities they also

... play a significant role in the customary economy of many communities. The spiritual and cultural significance of these animals is illustrated in the stories, traditions and contemporary activities of many coastal Indigenous communities and acted out in numerous ceremonies.

(DEH 2005:3)

Forest management has a long history of conflict with a diverse range of stakeholders expressing a range of often competing interests, notably: loggers (economic), recreational groups (recreational), indigenous (cultural) and environmental groups (conservation) (Castro and Nielsen 2001; Hiedanpaa 2005). Logging practices have become increasingly controversial with conservation groups contending that logging yields are unsustainable, whereas local logging communities express concern about loss of jobs and impact on the local economies. Many forests are also catchment areas for public and private water supplies, and tensions emerge over the impact of logging practices and water quality. A more recent debate has emerged in areas where climate change causes reduced rainfall and recharge to surface reservoirs and groundwater aquifers. It is well known that logging rates can alter groundwater levels and surface water flows (see for example Pothier, Prevost, and Auger 2003), and increased forest thinning is being promoted as a way to increase both run-off and aquifer recharge to make up for declining rainfall (Fellows of the Australian Academy of Technological Sciences and Engineering 2002). For example, the Water Corporation of WA (2005) has proposed to selectively thin one of the near-urban forest catchments in order to increase the surface run-off yield between 4–6 gigalitres annually.

Coastal and near-shore marine policy making usually involves an even more diverse range of users with different interests and values, including tourism, fishery, agriculture, boating, recreational, rural development, transport (shipping and ports), industrialisation, amenity, views and more recently wind farms (Striegnitz 2006). The rapid growth of coastal cities world-wide not only put added pressure on existing coastal urban coastal areas, they also threaten the values of small coastal settlements not previously subject to growth pressures. In Australia these concerns have led many coastal local governments to form a Seachange Taskforce to address the problems of urban and tourism growth on the coast

... before the coastal character and environment that Australians love so much is lost as a result of the massive changes brought about in coastal Australia by the growing numbers of people who are attracted there.

(Natoli 2006:5)

Concern over coastal development outside the existing urban areas is not just about conflicting values but is also a deeper concern about identity and local ownership of the coast. Small coastal communities fear that rapid growth will change their existing character as the new residents bring different values, and their mere presence puts pressure on the existing infrastructure on what is perceived as a fragile local environment.

Conflict involving policy making and management of water resources is also about the ownership of the resource. Typically, the new resource (dammed river or underground aquifer) is located outside the urban area that will utilise the resource, usually because urban land uses degrade local water resources making them unsuitable for human consumption. Local users of the resource not only value the resource for non-urban uses (e.g. recreational) but also see the resource as being theirs. This conflict is summed up by Steinberga and Clark (1999) as:

... a clear division between 'us' — the rural/exurban victim — and 'them' — the urban exploiter. 'Us' is portrayed as local, ecologically holistic, small-scale, and sustainable, and 'them' is just the opposite. 'They' are using 'our' nature for 'their' development. 'We', in turn, must regain control of 'our' nature and oppose 'their' development.

(Steinberga and Clark 1999:479)

Thus, the debate is broader and deeper than just conflict over different uses and values but one of ownership of the resource.

Patterson Montag et al (2003) take a slightly different view of the social aspects of policy making conflict and argue that conflict management is on-going and never-ending. This is because whilst policy making can address existing different interests, these are never static. Inevitably, social context will change (for example, increasing urbanisation, changing demographics and gentrification); which causes the cultural meanings of the environment to also change, creating new values and goals for the policy makers to deal with. This brings about new problems and conflicts not previously foreseen.

Differences in various stakeholders' abilities to exercise power as part of policy making are also a cause of conflict. In cases where the level of power determines which interests and values prevail, and the policy outcomes — that result, those with less power may seek other ways of influencing decisions (e.g. court action) or look to form coalitions with other stakeholders so as to change the power balance in their favour (Yasmi, Schanz, and Salim 2006).

Ebbin (2004) notes that the more participative approaches to policy making, which are used in part to address the conflict embedded in the particular environmental issue in question, have the potential to change the nature of the conflict. This is because more stakeholders are brought into the process bringing in a broader range of interests not previously expressed, existing stakeholders have to re-examine their roles within the process, and the rules for dealing with decision making need to be adapted.

Another way of looking at these social conflicts is to see them as an increasing *socialisation* of the environment, where individuals and groups value the environment for more than their intrinsic or *use* values. Instead, individuals see the environment as part of some broader social amenity and, therefore part of their general quality of life. Seen this way, conflict over

environmental issues can be seen as individuals and groups seeking to either maximise their amenity and quality of life, or to minimise any potential loss. It is this increasing socialisation of the environment that has accompanied many of the modern environmental policy making exercises.

The problem for policy makers is that introducing the social into environmental decision making brings with it matters that are both difficult to quantify and measure and are also difficult to resolve by simply doing more science. Significant questions emerge: how do you quantify values and social amenity? How do you decide which stakeholders groups lose amenity so that another one gains? How do you separate perception of loss and actual loss?

In response to the socialising of the environment, many scientists and environmentalists call for a separation of the technical and political aspects of policy making with the hope that science can be freed of social biases, which will then better inform decision making. The increasing use of environmental indicators is a direct response to calls that science should be separate from the politics. Environmental indicators are meant to be quantitative measures of the state of the environment so that management and decision making are better informed (Bockstaller and Girardin 2003; Rice and Rochet 2005); although some authors express caution over their use (Olsthoorn et al. 2001), whilst others cast doubt on their effectiveness on actually measuring what they purport to (Hughes 2002).

There are other authors who call for science and politics to be integrated rather than separated as part of environmental decision making (Eduljee 2000; Mercer 2001). Eduljee calls for a new paradigm of decision making that:

... relies crucially on a better understanding of environmental and biological processes and on greater sophistication, transparency and rigour in the application of science, but within a collaborative and consensual decision making framework.

(Eduljee 2000:21)

Other authors call for an approach where community values are integrated as part of the technical assessment, and political decision making is based on this socialised assessment (Bohnenblust and Slovic 1998).

This socialising of the environment is also apparent in the setting of environmental standards. Environmental standards are directly related to the level of environmental protection people experience: the higher the standard, the higher the level of environmental protection and the higher the social amenity. Here, the science and any predicted impacts are usually clear and uncontested, but dispute occurs over what is seen as an acceptable level of environmental degradation or protection. Air quality standards set locally at Kwinana south of Perth provide a good example of this.

Kwinana is WA's premier heavy industrial area, with large residential areas to the north, east and south. Air quality standards were originally set in the 1980s but only for sulphur

dioxide and dust. There was little public pressure to change those standards until the mid 1990s. A recent review of air quality standards in the area associated with a proposed iron ore smelter at Kwinana noted that community concern about air quality had grown and that standards were also being demanded for a range of other air contaminants, including dioxins, furans, poly aromatic hydrocarbons and heavy metals (EPA 2002). The community was also concerned about the cumulative effects of the whole cocktail of contaminants. Modern communities are becoming more aware of possible ill-effects of a range of contaminants, and are demanding higher levels of protection, both in terms of the number of contaminants of concern and the level of exposure that is considered acceptable.

In summary, social conflict in environmental policy making is about stakeholders' different interests in the environment where each holds different values and expresses different goals for its use. In some instances, where some of the stakeholders are local and others are located distant from the resource or are new to the area, ownership of the resource and fear of loss of identity adds further to the conflict. Power inequality between stakeholders adds another social dimension. Importantly, these aspects of social conflict are not new to environmental policy making and have been dealt with in various ways, depending on the level of conflict and as the nature of conflict has evolved. These conflicts can also be seen as an increasing socialisation of the environment, which adds further complexity to modern environmental policy making and adds significantly to the nature and extent of that conflict.

Whilst this discussion on the social aspects of conflict is helpful, it does not address the two more recent issues peculiar to modern environmental policy making that allow these primarily social aspects to be played out even further through the policy making process: governance, and science and information.

Governance theme

Governance is used here rather than the more narrow term of *government*. Government is typically a collection of people vested (often through a democratic process) with the authority to govern a country or part thereof. It is, therefore, easily identifiable and usually has definable outcomes including legislation, regulations and policies. Shore (2006:719) argues that governance, however "is a more protean term that includes the action and manner of governing". It is, therefore, a broader concept that deals with decision making that goes beyond just actions by individual governments.

The focus of this study is on public rather than private governance, which can Hill and Lynn (2004) define as:

... regimes of laws, rules, judicial decisions, and administrative practices that constrain, prescribe, and enable the provision of publicly supported goods and services through associations with agents in the public and private sectors.

(Hill and Lynn 2004:4)

Governance recognises the more complex power sharing arrangements that exist in modern societies that have emerged because of the trend towards more participatory democracy and increasing deregulation of environmental management in favour of free market and voluntary approaches. As a result, decision making has become more decentralised. It also recognises the more complex international governmental arrangements in the global community. For example, the European Union prefers to refer to governance rather than government (e.g. CEC 2001) when discussing government decision making in Europe. Modern policy making is also more about governance than governing, particularly where governments either share decision making with various groups or delegate decision making entirely.

One type of governance conflict in policy making is where different government regimes have jurisdiction over the same resource. For example, river and catchment management can cut across both national and sub-national borders bringing together different ways of decision making, and governments with differing priorities (Hensel, McLaughlin Mitchell, and Sowers II 2006). This is really about the incompatibilities between political boundaries rather than the extent of environment problems. As Meadowcroft (2002:169) notes: "Environmental problems do not respect political boundaries, instead they cut across established jurisdictions or link discontinuous regions."

Pollution from industrial complexes or agricultural land uses, once released into the environment (air and water), become highly mobile, cross national boundaries, and cause adverse impacts far from the source. As noted by Sundqvist and others (2002):

The discovery of transboundary air pollutants has not only challenged jurisdictional borders of the nation-state but also social and cultural boundaries, not least the one between science and policy.

(Sundqvist, Letell, and Lidskog 2002:147)

Acidification in Europe and the various governments' responses to the problem illustrates the difficulty in dealing with cross-boundary environmental issues. In the 1960s scientists produced conclusive evidence that sulphur emissions from central Europe caused acidification and subsequent ecological damage to lakes in Scandinavia (Krewitt et al. 1998). It took until 1979 before the first North American and European inter-government agreement to deal with acidification was agreed to, with the signing of the Convention on Long-Range Transboundary Air-Pollution (LRTAP). Whilst there has been considerable progress made since 1979, with LRTAP being expanded to include a range of other pollutants including nitrogen, volatile organic compounds, eutrophication and ground level ozone, progress to get agreement has been slow and some problems remain, for example agreements on dealing with persistent organic pollutants (POPs) have been particularly difficult to achieve.

Some environmental problems go beyond regions and have global implications, for example human-induced climate change. The difficulty in reaching agreement on what

actions to take to address that problem reflects the incompatibility between political boundaries and ecological boundaries at a global scale. One of the barriers to achieving international cooperation on greenhouse gases has been the predicted uneven impact that climate change and the Kyoto Protocol will have on different nations. As President George Bush told ITV in Britain earlier in 2005:

I walked away from Kyoto because it would have damaged the American economy, it would have destroyed the American economy, it was a lousy deal for the American economy.

(AFX News Limited 2005)

In the absence of a strong global government, cooperation between national governments is fundamental to addressing climate change, as the 2001 IPCC report on climate change (2001:29) noted: “The primary factors underlying anthropogenic climate change are similar to those for most environmental and socio-economic issues (and include) governance structures”. To date, cooperation between national governments has been slow to materialize.

Appropriate geographic scale is also an issue at the sub-national and local levels of government. Geographically large nations like Australia, Canada and the US with federal systems of government often struggle to deal with catchment-related issues where the catchment boundaries do not match the sub-national (State) and local government boundaries. Frustration in getting agreement between sub-national governments to deal with these issues has even lead some authors to call for administrative political boundaries to be re-drawn to coincide with the natural resource boundary (Heikkila 2004). As Crowley (2001) noted of the then Commonwealth government’s primary environmental programme, the National Heritage Trust (NHT):

The effective federalist aim of improved intergovernmental relations has also been thwarted—by unilateral federal NHT directives on the one hand, and by poor state environmental practices on the other. The NHT is also in danger of failing as a national conservation measure by failing to achieve its intended ecological outcomes.

(Crowley 2001:267)

The development in 1998 of Australia’s national oceans policy has also been difficult, in part because of a lack of agreement between governments (State and National) with overlapping jurisdiction. Smyth et al (2003) noted that prior to the policy’s formulation

The management of Australia’s oceans has been the responsibility of a confusing myriad of state and Commonwealth government agencies, and state and Commonwealth legislation, regulations and management plans. The result has been inconsistent, inefficient and ultimately unsuccessful management of Australia’s marine regions.

(Smyth et al. 2003:10)

The 1998 policy, at the insistence of the various State Governments, did not include a statutory obligation for State governments to comply with the policy, which means it will only be effective if the States agree to cooperate (Wescott 2000). Cooperation in the policy's implementation seems unlikely as not one State Government has endorsed the policy (Foster and Haward 2003).

Another source of conflict involving governance relates to the structure and operation of government agencies. There is a growing view that the way bureaucracies operate, and the way they are compartmentalised, is not conducive to good environmental management. The concern is that most contemporary environmental problems do not fit neatly into the mandate of any one agency. Consequently, environmental policy making usually involves a range of agencies resulting in inter-agency conflict and less than optimum environmental performance. Conflict can arise over: sharing of power between the agencies (Hooper, McDonald, and Mitchell 1999); the fragmented, uncoordinated way different agencies make decisions (Bellamy and Johnson 2000); and through poor coordination between regional and head offices within the same agency (May 1995). Some agencies are simply resistant to change and, as Alder argues (2001:664) "bureaucratic agencies burrow into ruts that keep them on courses long past their usefulness". This inertia not only leads to less than optimal environmental performance, it is the source of much frustration for stakeholders, both from industry and the community.

A third source of conflict involving governance relates to tensions that emerge between the agencies responsible for the policy and the broader community. Bureaucracies have been accused of being inherently biased in the way they use and interpret information (Edwards and Truda 1991; Towers 1997). This can simply be a bias of emphasis where technical bureaucrats bring a particular interpretation to a set of data or it can be bias in favour of certain stakeholders over others.

Many environmental agencies struggle with the increased demands by the community and governments to be more consultative in their policy making and decision making. An independent review of Western Australia's Department of Environment was carried out in 2003, with one of the terms of reference being to:

Investigate management and cultural norms and recommend appropriate reforms and change management to increase the level of community trust in the organisation.

(Carew-Hopkins 2003:12)

That review concluded that "In terms of the organisation culture the main view is that some parts of the combined agency had a defensive culture in its dealings with the community" (Carew-Hopkins 2003:1), and went on to recommend that

The Department should finalise the Community Involvement Framework, train staff and continue Risk Communications training across the Department; review and

enhance the communications system in emergency response. A code of conduct needs to be developed to guide behaviour at community meetings.

(Carew-Hopkins 2003:10)

Decreasing public trust in both governments and their agencies is a growing problem. As the Commission of the European Communities' White Paper on European Governance notes:

On the one hand, Europeans want (agencies) to find solutions to the major problems confronting our societies. On the other hand, people increasingly distrust institutions and politics or are simply not interested in them.

(CEC 2001:3)

There is also concern about the overall effectiveness of government efforts to manage the environment. As Demmke (2001), from the European Institute for Public Administration, noted in a paper on better environment governance in Europe:

Environmental regulation has grown over the past thirty years, and so has concern about regulatory failure and criticism about the inefficiencies of regulatory and command – and control–approaches. On the other hand, (still!) very few empirical facts are known about changing regulatory styles, new management approaches and instruments and their impact on the environment.

(Demmke 2001:22)

A fourth source of conflict involving governance relates to the mis–match between political timeframes and environmental management timeframes. Electoral cycles that last 2–5 years are often incompatible with the times scales needed to deal with environmental problems. Short electoral cycles often lead to solutions that yield short term results at the expense of long–term environmental gains. Salinity, considered by many to be Australia's most significant environmental issue (Beresford 2001), is an example of this temporal mis–match. As the WA EPA noted in its 1998–99 Annual Report (EPA 1999:6): "The EPA regards salinity as the most serious environmental issue in Western Australia."

Dryland salinity is a particular problem in the WA's south eastern agricultural area (wheatbelt) where recent estimates put the area of salt–affected land at around 3.6 million hectares, rising to 6.5 million hectares by 2050 (Frost et al. 2001). Widespread clearing occurred in the wheatbelt from the 1950s onwards, with the first evidence of problems being reported in the 1970s (Conacher and Conacher 2000). Despite this, successive governments did little to halt or control clearing in the wheatbelt or to provide management responses to address this emerging problem. This was despite a series of reports calling for action, including a 1988 Legislative Council Select committee report stating "without doubt salinity is the most serious environmental problem facing the State today" (Legislative Council Select Committee on Salinity 1988:ii), and a follow up 1991 Legislative Council Select committee report stating:

There is an opportunity available to the Government, the Parliament, and the people of Western Australia to act decisively. Inaction will condemn our State's environment to a future of rapid deterioration which will impact on the lives and living standards of all Western Australians.

(Legislative Assembly Select Committee on Land Conservation 1991:i)

The mid 1990s saw the start of a more concerted government policy response to the issue with the production of a draft salinity strategy in 1995 (Joint Steering Committee on Salinity 1995), a final strategy in 2000 (State Salinity Council 2000), and a report by a taskforce set up to coordinate actions on salinity in 2001 (The Salinity Taskforce 2001). The Commonwealth Government became significantly involved in addressing the problem when in 2000 it committed \$700 million as part of a national action on salinity. Despite this, criticism of governments' inaction remains strong, for example Beresford, Phillips, and Bekle (2001) argue that:

Salinity is very much a case study of the general critique about the lack of effectiveness of government policy-making capacity on the environment especially in Australia's federal system.

(Beresford, Phillips, and Bekle 2001:37)

The root cause of salinity — catchment clearing — was not seriously addressed in WA until the late 1990s when the EPA began to recommend against clearing of remnant native vegetation in locations with less than 20% cover still remaining. As the EPA noted:

Much of the South West of the State now needs extensive and high level intervention to restore hydrological processes at the catchment scale, and this needs to happen soon. Faced with this, continued clearing in these areas cannot be supported environmentally.

(EPA 1999:5)

This lack of effectiveness by successive governments can be traced directly to the electoral cycle and the over-riding imperative of governments to be re-elected. Issues that both directly affect the majority of electors and can be addressed quickly get attention ahead of issues affecting a small number of electors or requiring strategic long-term actions with no short-term benefits: salinity is one of those latter issues. Salinity is a direct problem for rural Australia, but only 30% of WA's population live outside the main metropolitan area, with most of these in the smaller urban areas away from the wheatbelt. The Salinity Taskforce set up specifically by the Government to implement a salinity action plan argued that actions to reverse the effects of salinity "will require a long-term strategy over many years — beyond the normal terms of Government and probably over several generations" (The Salinity Taskforce 2001:19).

To sum up, there are certain aspects of modern environmental governance that lead to conflict through the policy making process. This conflict has become more pronounced in

recent times with: the growing complexity of government and decision making arrangements; calls for greater participation in decision making; and the trend away from regulating the environment to more free market and voluntary approaches. Conflict emerges —

- Where there is a mis-match of natural resource management boundaries and political boundaries;
- Where there are inappropriately structured bureaucracies;
- When growing tensions emerge between agencies and the public; and
- Through the inability of short term political cycles to deal with the emerging environmental problems that require much longer timeframes to be addressed properly.

Science and information

The nature and use of science and information is becoming a significant source of conflict in policy making, particularly where the environmental problems are highly complex. Claytor (2000:1111) notes that in fisheries management conflict is escalated when the information upon which decisions are made (e.g. the size and geographic extent of the fish populations) is both limited and highly uncertain. He argues that any decision made in this environment can be criticised as being arbitrary and unfair and thus add to already elevated levels of conflict.

Ecosystem and catchment level policy making is also characterised by both the complexity of the environment and a paucity of reliable data that describes how these areas function and react to change (Pavlikakis and Tsihrintzis 2003; Laine and Kronholm 2005; Wittmer, Rauschmayer, and Klauer 2006). Clarke (2002:347) argues that in these cases managers and policy makers “have come to confront uncertainty as a core part of their work and philosophy rather than as an unwelcome but hopefully temporary aberration”.

At its simplest, conflict emerges because scientists cannot make accurate predictions about how the ecosystem as a whole will react to change and as a result, different views form about future impacts and changes. In many cases, the ecosystem or resource generates significant public interest because: it is either publicly owned, for example forests (Carr, Selin, and Schuett 1998; Steelman 2001); has a range of users and stakeholders, for example fisheries (Ebbin 2004); or is the home to significant urban and rural populations, for example catchments of coastal inlets (Colman 2002). This mix of scientific uncertainty and diverse social interests has the potential to generate high levels of conflict.

Conflict can increase in cases of scientific uncertainty when: the risk to the environment of using trial-and-error methods is considered to be too high; development and management decisions cannot be postponed to facilitate further data collection because there is

considerable pressure for development and growth; and a consensus is needed to proceed (Bennett and Lawrence 2002:24). There is a real possibility that if policy makers make decisions based on the best available science and it turns out that the science is wrong, the results could be catastrophic. Policy makers are faced with almost irresolvable controversies and often apply risk assessments to determine the level of risk involved with various options as a way of managing community concern (Bohnenblust and Slovic 1998).

Risk, by its nature, implies that adverse outcomes are possible, and so some communities seek to challenge risk assessments and the levels of risk calculated. In some cases, the community argument is based on a simple desire to have zero risk, but more and more communities engage their own experts or become experts themselves in risk assessment (Tesh 1999). In these cases, a public debate emerges where different scientists and experts dual over the implications of the limited data set and the resultant risks to the environment. Credibility becomes a significant issue where stakeholders and policy makers give greater weight to those scientists and experts with the greatest (perceived?) credibility.

Writers like Ulrich Beck take this risk and uncertainty issue a step further, suggesting that the levels of risk generated by industrialisation are becoming increasingly central to how society functions, to the extent that we are becoming a risk society (Beck 1991, 1995; Beck 1998, 1999). Beck sees a risk society as being an outcome of the late industrial society. In early industrial societies, hazards and any resulting impacts were localised, visible, quantifiable and predictable. The impact of any accident could be easily addressed by applying more advanced technologies, and the costs associated with fixing the effects of any accident were easily covered by the various insurance schemes (including from the State via unemployment and sickness benefits).

In a risk society, the risks are, by contrast, widespread (possibly global), invisible, difficult if not impossible to quantify and highly unpredictable. The impacts of any accident cannot be easily fixed by using more advanced technology, and the resulting costs of dealing with the effects of an accident cannot be recovered through insurance schemes. Examples include nuclear accidents, ozone depletion, climate change and release of genetically modified organisms. These risks have the potential to cause global annihilation. It is not surprising, therefore, that the level of conflict elevates for risk societies.

Another source of conflict is the challenge to the objectivity of science, and relates to a growing view that science and expert decision making are not the objective, value-free endeavours that they were previously thought to be. They are, in fact, set within the broad social context and values of Western thought and the narrower set of beliefs of an individual scientist or expert. As Huesemann (2002) argues:

... it is intrinsically impossible to carry out objective and value-free scientific research and that, in fact, all environmental science is inherently biased by subjective opinions and values.

(Huesemann 2002:622)

The implication that science may be inherently subjective suggests that truth is not absolute but is relative. Many scientists are concerned about this move towards relativism because, as Allchin (2004) notes:

The fear among many seems to be that science will be reduced to nothing but politics. Social interests will be viewed as eclipsing rationality. If one cannot establish that science adheres to objective, universal standards for knowledge, then it cannot escape the awful Charybdis of utter relativism. And if there are no scientific laws, how could one justify laws of any kind? All will be chaos. Anarchy will reign.

(Allchin 2004:935)

The debate over subjectivity in science is most noticeable in risk assessments where, as Eduljee (2000) argues:

The realisation that value-laden judgements and decisions permeate every facet and every stage of risk assessment and risk management has led to the development of a new paradigm which demands a pluralistic approach to risk assessment and risk management and for value-focused decision making.

(Eduljee 2000:21)

Even in the highly technical field of geographic information systems (GIS), concerns have also been raised about its objectivity. For example Towers (1997) notes that:

Important GIS procedures, however, are inherently subjective and generate intrinsically contestable research results. Conceivably, but hopefully of lesser prevalence, unethical GIS practitioners may intentionally manipulate GIS to arrive at predetermined conclusions.

(Towers 1997:111)

Conflict can occur when other forms of knowledge, notably local knowledge, put forward during an environmental debate, are not given equal weight to scientific knowledge. In many cases, local knowledge is simply ignored. Local knowledge can be defined as a "loosely connected set of facts, skills and capabilities that are grounded in practice" (Martin 2003:58).

Scientists can be quick to dismiss knowledge held by local communities that derive from their own experiences as being biased and subjective compared to technical knowledge (Merrifield 1993). Indigenous people's knowledge is often dismissed as being soft, lacking rigour and credibility, and based on spiritual beliefs (Ransom and Ettenger 2001). This leads to significant conflict where differences between Indigenous and scientific knowledge and the values that support them can lead to views about how a resource (e.g. a fishery) should be managed (Castro and Nielsen 2001).

To sum up, science and information can be the source of conflict in environment policy making where:

- The science available to policy making is either lacking or unreliable, leading to great uncertainty about outcomes of policy making;
- Risk assessment becomes the basis of decision making because of the uncertainty;
- The scientists and the information they generate are seen as being subjective; and
- Relevant local knowledge is devalued or ignored as part of policy making.

The key modern driver of conflict — resource scarcity

These matters are more likely to become a cause of conflict when the element of the environment, or resource, at the centre of the debate becomes scarce. At its simplest, resource scarcity is about a decreasing amount of that resource. For example, conflict between commercial and recreational fishers can emerge when the stock being competed for is limited due to reduced total stock of fish, and each user's needs cannot be fully met. Resource scarcity can also occur when the total stock is not reducing. This occurs when, for example, a fish stock is regulated so that the total catch is sustainable but the number of fishers increases and existing users are unable to catch the number of fish they used to. There are many cases where both the quantity of resource is decreasing and the number of users is increasing.

Scarcity in relation to renewable resources like water and land is not always about *quantity* available but is about the *quality* of the resource available (Wenche and Ellingsen 1998). For example, access to fresh potable water is becoming a significant issue for developed countries, particularly as agricultural and urban land uses degrade the quality of existing supplies (Brandes 2005). In WA, only thirty-two per cent of major rivers are in a largely unmodified state (EPA 2006). Changes include loss of vegetation in the catchment, damming, construction of artificial waterways and loss of water quality. In these cases, the issue is one of scarcity of good *quality* resource (rather than being quantity).

Resources other than the traditional consumable resources can become scarce as well. Conflicts involving biodiversity conservation can also be viewed as a scarcity issue. As land clearing for urban development, agriculture and mining continues to reduce the coverage of native vegetation, communities are calling for the conservation of what remains: the more the clearing the louder the calls. In this case, the resource is not actually consumed but is valued in its own right, and the less there is of it the more what remains is valued.

The use (but not consumption) of existing natural areas set aside for on-going protection (for example, National Parks and the coast) can be seen as a scarcity issue in that, whilst the size of the resource may not change, a growing population brings new users, and competition for the resource increases. This becomes a competition for space within a fixed resource and the amount of space available for each user decreases relatively as the

number of users increases. Of course, the competition for public space is a common phenomenon in urban areas and can be the source of significant conflict, either where existing urban spaces gets transferred from the public to the private, or where new users move to a new area with existing users (Madanipour 2004; Morrissey and Gaffikin 2006).

As with consumable resources, where the decreasing availability of a quality resource creates a scarcity, increasing use of natural areas can lead to loss of environmental value through increased trampling, weed invasion, erosion, disturbance to fauna, and fires (Cole 2001). In this way the availability of quality natural resources decreases. This can be particularly true in so-called wilderness areas where the mere presence of humans diminishes the wilderness values of the area, with or without the other losses of environmental values.

In summary, conflict over a particular environmental resource (consumable or usable) is much more likely to emerge when those expressing an interest in that resource cannot have their needs fully met – in other words, there is resource scarcity. Resource scarcity can be about:

- A decreasing quantity of a resource,
- An increasing demand on a resource, and
- A reduced quality of an existing resource (scarcity of good quality resource).

To sum up, the case being made here is that modern environmental policy making often involves conflict at a level and scope (nature and extent) not previously experienced driven often by resource scarcity. This section of the chapter explored the nature of conflict in environmental policy making and proposed that this conflict can be categorised under three broad themes. The discussion now turns to the broad policy making approaches.

Environmental policy making approaches

Introduction

These sections examine the general approaches to environmental policy making. As noted in Chapter 1, policy making has three elements: the way that a policy is formulated, the decision making process to select the policy instruments, and the general nature of the policy instruments used. If policy making is examined from an historic perspective two trends can be seen that relate to these elements and help define the policy making approached defined here: increasing public participation (including cases where policy makers share decision making with the affected public); and, a growing number of types of policy instruments available to policy makers.

Recent work by Vigar and Healey (2002) on planning and environmental policy making is helpful here. They identify three broad policy processes. The first (unnamed) is a type of iterative process, which is “the outcome of the push and pull of the interests and perceptions of the powerful” (P. 518). The second process type is called *technocratic* which involves an apparent rational and objective approach to arrive at the right policy outcome. The third process is called *collaborative/deliberative/interpretive* which is clearly based on Healey’s earlier communicative planning approach.

From an analysis of these three elements for policy making and how they have been applied in the literature (i.e. the way that a policy is formulated, the decision making process to select the policy instruments, and the general nature of the policy instruments used) it is possible to identifying four broad policy making approaches, being:

- Traditional expert–driven,
- Ecological modern,
- Collaborative, and
- Adaptive–collaborative.

The first and third approaches are directly related to Vigar and Healey’s (2002) three processes. Their technocratic process is similar to the Traditional expert–driven approach, and their collaborative/deliberative/interpretive process is similar to the Collaborative approach. Few other authors give much attention or coverage to Vigar and Healey’s (2002) iterative process, analysis of policy making as part of this research did not find any examples of this process being used.

These four approaches are described in detail below. However, given the significance of the type of policy *instrument* in defining the four policy making approaches, these are described in some detail first.

Policy instruments

Overview

Three broad categories of policy *instruments* are generally recognised in the literature (Santos et al. 2006; Osborn and Datta 2006; Schreurs 2003):

- Command and control or regulatory,
- Economic, incentive or market–based, and
- Decentralised or voluntary.

The earliest environmental policies used command and control regulatory instruments, which was still the dominant instrument type used in developed economies into the early 1990s. These instruments typically involved prescribing, through legally binding regulations,

certain behaviours or certain environmental standards to either be achieved or not exceeded. During the 1980s economic instruments (for example special taxes and tradable permits) and voluntary mechanisms began to be used in environmental policies. An additional type of instrument emerged in the 1980s and became in more widespread use in the 1990s, which involved a move away from fixed and inflexible responses to managing environmental problems to more flexible and adaptive responses: these responses are generally called adaptive management. Each of these categories of policy instruments is described in more detail below.

The command and control instruments

The use of command and control instruments is where “authorities establish the behaviour that should be adopted by the actors/firms, by making it mandatory, allowing for little flexibility in the means of achieving policy goals” (Santos et al. 2006:101). Command and control instruments typically include prohibitions on certain types of product (e.g. CFCs) or activities (e.g. excluding certain land uses), discharge standards for key contaminants, or specify certain technology-based solutions. These prescriptions need to be codified in some statutory mechanism so as to ensure compliance, including legislation, regulations, statutory policies and land zoning that preclude certain land uses.

These instruments were first used in the late 1940s and have been applied in one form or another since then in a variety of circumstances. Janicke and Weider (1995) published a study of successful environmental policies from 12 OECD countries, the majority of which adopted regulatory command and control policy mechanisms. The study went on to note:

... our examples show that governmental command and control remains a strong instrument in environmental policy but new types of and modes of governmental intervention are needed and possible.

(Janicke and Weidner 1995:21)

Command and control instruments used prior to the 1970s were typically reactive and *ad hoc*, involved technical fixes that usually adopted end-of-pipe technology, did not address the fundamental cause of the problem, and gave little consideration to environmental impacts (Janicke, Monch, and Binder 2000). This was due in large part to there being few, if any, supporting laws that gave significant powers to the environmental agencies for enforcement and control (Marcus 1986; Szarka 2002). Today, policies using command and control instruments have strong legislative bases and are usually supported by well understood science. As Dear (2000) notes, these policies are based on a strongly rational and objective view where science is central to the way the environment is understood, decisions made and solutions to problems found.

Economic, incentive or market-based

Economic based policy mechanisms are, generally, where the environment is ascribed an economic value and pricing measures are applied to direct resource use. In this way, the market decides what technical solutions specific industries apply in each circumstance. These mechanisms became popular with the rise of neoliberalism in Western countries (see discussion under the ecological modern approach below). Neoliberals called for a reduced role for governments in regulating industry and for the replacement of legislative command-and-control instruments with either market based instruments (including resource valuing and trading) and eco-taxes, or incentive based instruments. This was particularly evident from the 1980s onwards (Mansfield 2006). When economic based measures are used, the role of governments and their agencies is restricted to setting environmental standards for industry to achieve, but not to prescribing how those standards are to be met.

Resource valuing and eco-taxes, in effect, put a price on either the resources being used or the waste being produced. This provides a direct economic incentive for firms to reduce consumption of resources and waste without the need to regulate industry. Incentive based systems work in a more positive way. Governments can provide tax benefits for companies to comply with set standards of emissions and companies not complying simply don't get the benefits. Incentives aren't always directly economic. In some cases, the incentive to comply with government environmental standards is to avoid governments introducing what deLeon and Rivera (2007:685) call "more constraining and invasive government-imposed regulations".

Tradable permits are another market mechanism. Here, a cap is set on the total amount of a pollutant allowed to be emitted to a particular environment by a regulation. Firms can purchase a licence to emit amounts of that pollutant, with the total amount allowed to be sold no more than the cap. Firms can either trade the whole licence or any portion of the total load allocated to them.

Decentralised or voluntary

Voluntary mechanisms (called Voluntary Environmental Programs or VEPs in the US) are described by deLeon and Rivera (2007) as

... self regulation agreements that can be promoted by firms, governments, industry associations, and/or environmental groups to compel business to enhance their environmental protection performance.

(deLeon and Rivera 2007:685)

They have been in use in the US since the 1990s and are now used in most countries, often to deal with greenhouse gas emission and pollution (Glachant 2007:32). The most common examples of VEPs in Australia are industry codes of practice.

Koehler (2007:689) argues that the rise of VEPs was due to a "confluence of several events", notably the introduction of more complex legislation and problems and cost of compliance, new technical discoveries and innovations not covered by existing legislation, and reduced agency budgets for regulating industry.

The effectiveness of VEPs often gets questioned (Glachant 2007) largely because critics claim that there is no incentive for firms to comply. Some arguments put up as to why firms would willingly introduce costly environmental controls when they are not compelled to include: a desire to attract green consumers; such measures reduce the pressure from lobby groups to seek stronger legislation; to avoid future environmental liabilities; and, to avoid consumer boycotts by environmental interest groups (Innes and Sam 2008:272).

Adaptive management

Overview

Adaptive management is an approach that deals directly with this issue of uncertainty (Luke 2002) and differs from traditional management practices in that it is highly flexible by adapting to changing circumstances. Adaptive management is defined by Bennett and Lawrence (2002:24) as a "systematic process for continually improving management policies and practices by learning from the outcomes of operational programs". One of the outcomes of the learning process is increased knowledge, leading to a better understanding of the environment being managed, and, in this way, reducing uncertainty.

Whilst adaptive management was first applied in 1978 (Jacobson et al. 2005:1517) it has now become widely used to address the management of complex ecosystems, including: fisheries management (Marttunen and Vehanen 2004); biodiversity protection (Dallmeier, Alonso, and Jones 2002); catchment and marine management (Habron 2003; Clarke 2002); climate change (Maclver and Dallmeier 2000); and forestry (Klooster 2002). It is now extensively used in a variety of circumstances in Australia as well, including fisheries, water allocation, urban water catchments, rural catchment nutrient management, and coastal management (Gilmour, Walkerden, and Scandol 1999).

Types of adaptive management

There is no single uniform adaptive management approach used both in the literature and in practice. Pagan and Crase (2005:78), however, identify three types of adaptive management:

- Evolutionary or trial and error — where early choices are essentially haphazard and later choices are made from those early choices which have proven to work;
- Passive adaptive — where historical data or lessons learnt from similar systems are used and reviewed to select a preferred management approach that is most likely to work, with limited room for flexibility once implementation occurs; and

- Active adaptive — where management choices are not fixed and will change as new information emerges, suggesting new management measures are required.

Several studies identify four key steps to adaptive management. First, the available data are collected and used to predict both the impacts of developments or changes, and the level of uncertainty associated with the predictions. Often, but not always, an environmental model is used to help make those predictions. Second, predicted impacts are then used to set best available management practices and/or design elements for development. These practices and design elements must have a high degree of flexibility built into them to allow adaptation later if required. Third, a comprehensive data collection and monitoring program is established to increase the understanding of the system and to look for evidence of change and adverse effects. Finally, the results of the monitoring are continually reviewed, any modelling adjusted and the predicted outcomes re-assessed. Consequently, management and design elements may need to be modified or adapted in response to measured or predicted changes to environmental conditions, both positive and negative (Lessard 1998; Parma 1998; Bennett and Lawrence 2002; Dallmeier, Alonso, and Jones 2002; Habron 2003; Marttunen and Vehanen 2004).

It is clear that whilst modelling is a significant component of many adaptive management exercises (Rivers-Moore and Jewitt 2007; Johnson and Williams 1999; Moore and Conroy 2006), other examples place less emphasis on the modelling and much more on the information gathering, learning and subsequent changes to management practices (Luke 2002; Jacobson et al. 2005; Busenberg 2004). Learning is particularly emphasised where, as Busenberg (2004:321) argues, the goal is to “create systematic learning mechanisms through which policies continually generate (and adapt to) relevant knowledge”.

Proposed categorisation of adaptive management types

Building on this work and reviewing the literature on adaptive management, a model is proposed here to explain the range of practices that are called adaptive management. This model recognises two dimensions of management and two critical management tools. The two dimensions are: level of understanding of the system to be managed; and the implications of making the wrong management choices. The two critical management tools are data collection and modelling. The nature of adaptive management will vary depending on how those two dimensions apply in a particular situation requiring either more or less intense use of these two critical management tools. This model recognises three adaptive management scenarios and three types of adaptive management, similar to Pagan and Crase’s (2005) three types.

Level of understanding is based on two factors: the amount of direct data available on the system; and whether there are other similar systems that have been studied and how good the level of understanding of those systems is. On one extreme, there are those unique systems where there are little if any data available. On the other extreme, there are systems

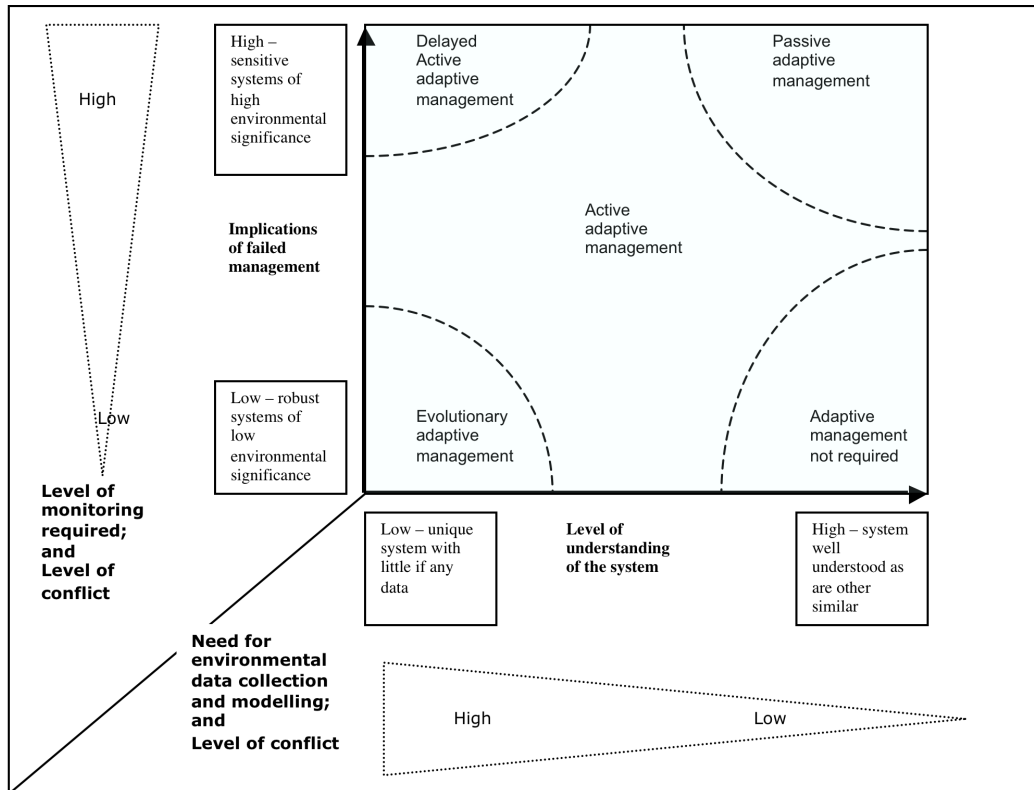
where there are considerable direct data and other similar systems have been well studied and are well understood. Intermediate to this are those systems where little direct data exists but other similar systems have been well studied and are well understood. The level of understanding is also related to the level of conflict associated with the management of the system where the less understanding there is, the greater the level of conflict is likely to be.

The implications of making wrong management choices relate to how sensitive the system is, and the environmental significance of the system. On one extreme (high) the system is very significant and is highly sensitive to change, so that management errors would likely lead to significant and irreversible environmental harm. Those changes happen so quickly that management choices cannot be changed before significant environmental harm results. On the other extreme are those systems that either have low significance and are so robust that wrong management decisions would show little environmental harm, or the change is so slow that management choices can be changed before significant environmental harm results. The implications of making management errors is also related to the level of conflict associated with the management of the system. In cases where the risk of significant environmental harm is large, it is more likely that the level of conflict will be higher.

Data collection and modelling are the two critical tools for adaptive management. Modelling can be used to extrapolate from existing data to make predictions on how the system will respond to change and, therefore, what management measures are needed to address any predicted adverse changes. Data collection is needed for two reasons: to measure changes to the system (monitoring) and for improved understanding of the system dynamics. The results of the monitoring are used to check actual changes compare to modelled changes. Where measured changes are different from modelled changes then management measures need to be altered (adapted) to allow for those changes. As well, the monitoring and additional environmental data are used to fine-tune the model to allow for fresh predictions of changes and to determine the required changes to management.

Figure 1 below shows this model and types of adaptive management.

Figure 1: Proposed model of adaptive management practices showing the three approaches and five adaptive management scenarios



As can be seen, three types of adaptive management and five adaptive management scenarios are defined as discussed below.

Evolutionary adaptive management is in effect trial-and-error management, where a management choice is applied without any knowledge of how the environment in question is going to respond, but the system in question is robust and usually of low environmental significance. A list of management options is drawn up and the first choice is made based on what seems reasonable and what has worked in other situations that have some parallels to the system in question. Monitoring is essential to measure the environmental response and to judge the success of the first management choice. The results of the monitoring and the success of the first choice also help to narrow down the original list of management options to those more likely to succeed. Where the first choice fails to work, another choice is made from the narrowed list of management options. The monitoring becomes the key learning mechanism. In practice, trial and error is not simply a random choice, and managers would likely be informed by their own experiences and the lessons from other similar environments. In this way, the risk of a wrong initial management choice is reduced. Evolutionary adaptive management is appropriate in cases where modelling is not readily available or is considered costly and/or unreliable, the system in question is relatively robust, and the risk of significant environmental harm is minimal. As a result, the

level of conflict is reduced even though there will be debate over what management measures to adopt. This is because the implications of failure of management are low.

Passive adaptive management is where there is a large amount of existing environmental data, both directly related to the system in question as well as in other systems that are known to behave similarly to the one in question. Modelling is often, but not always, done to predict the likely outcomes of the expected changes. If modelling is not used then experience with other similar systems is used to predict expected changes. Management options are drawn up and evaluated, based on the modelling and/or experience in other systems, and a preferred management approach agreed to. The key adaptive part is the process that leads to the choice of the final management option, and because of the high level of confidence that the system will respond as predicted, there is limited expectation that management would need to change once implementation begins. Monitoring is required not because of any uncertainty over the likely effects, but because the system is highly sensitive to change and usually has high environmental significance. Here, the risk of significant environmental harm is low but the implications of failure are high. Monitoring, then, provides comfort that any failure will be picked up early and management changes quickly implemented. The level of conflict associated with passive adaptive management can be high but is not related to what management measures to adopt. Conflict will centre on whether to proceed with the development or not given the sensitivity and significance of the system, as the implications of failure of management are significant.

The two extreme points of the model (the other two adaptive management scenarios) are where adaptive management is not required, but for two very different reasons. In cases where the systems in question are robust, of low environmental significance, and there is a large amount of existing data (both directly related to the systems in question and in other systems that are known to behave similarly to the system in question) management choices are well known and tested, and are highly unlikely to lead to environmental harm. The level of conflict over both the science in support of decision making and the management options is relatively low. In these cases, adaptive management is unnecessary.

On the other extreme are the cases where the systems are sensitive to change, have high environmental significance and there is little if any environmental data, both directly and from any other systems that are known to behave similarly. It can be argued that the risk of serious environmental harm is so great that any decisions on development affecting these systems need to be delayed until sufficient data have been collected to allow predictions of possible impacts to be at some reasonable level of confidence. Only then can management options be developed that can deal with the imposed changes to the system and an adequate monitoring system drawn up. In these cases development should be delayed until the data are available. As well, the level of conflict is likely to be extremely high because of uncertainty over the science and the implications of failure of management are so significant.

The third type of adaptive management, active adaptive management, is applied in cases not covered above, for example:

- Sensitive systems of high environmental significance, and a reasonable level of understanding of the system;
- Reasonably sensitive systems of moderate environmental significance, and a reasonable level of understanding of the system; and
- Reasonably sensitive systems of moderate environmental significance, but with a poor level of understanding of the system.

Active adaptive management requires both adaptation at the initial management selection phase and, more importantly, as part of implementation. As well, some form of modelling is normally used which can range from highly quantitative computer modelling to more qualitative descriptive models. Data are needed for the purposes of providing base-line information about the existing state of the environment and as an initial input to the modelling. The modelling is used to make predictions about how the environment might respond to certain human-induced changes, including management. The results of the modelling are used to adjust the design of the development and to select the management responses that are most likely to succeed. Monitoring is carried out as part of implementation to evaluate the success of management and to better inform the modelling. Modelling is also improved as the quantity and quality of background environmental data collected specifically to get a better understanding of the system increases. Where the measured changes are different to predicted changes, management is then adapted in response to these measured changes and any re-modelling is based on the new data. It is important to note that management changes can be either tighter or less stringent. If the measured changes involve more environmental harm than predicted or allowed, then management is tightened. If the measured changes involve less environmental harm, then there is a case for more flexible management.

These three types of adaptive management cover the full range of adaptive management practices described in the literature and carried out in practice, but because conflict is a key theme of this study, where adaptive management is referred to in the rest of this thesis, it will be referring to only active and passive adaptive management.

The four policy making approaches

The following sections cover the four policy making approaches under four main sub-headings: overview; participation and decision making; policy mechanisms; and concerns and criticisms.

Traditional expert–driven approach

Overview

This approach is the oldest of the four approaches, and, as the title suggests, is dominated by technical policy making experts, which may include experts from industry as well as government. As noted earlier, this is similar to Vigar and Healy's (2002) technocratic policy process.

Participation and decision making

The level of participation reflects the decision making process for the policy, which is highly centralised with the policy making experts. Early traditional expert–driven policy making had minimal, if any, participation and could best be described as being usually at IAP2's (2007) *inform*, or as low as Healey's (1997) *therapy* or *manipulation* levels, where industry and the broader community were provided with information about the nature of the policy already agreed to through a process largely internal to the policy making agency. With the rise of environmentalism as a strong social force in the 1970s policy makers began engaging in higher levels of participation, mostly IAP2's (2007) *Consult* with some at *Involve*, but there was growing pressure for some level of real decision making (*Collaborate* and *Empower*). Policy makers were resistant to sharing decision making, largely because traditional expert–driven policy making is an expert–based decision making process, and the broader community are seen as not having the necessary expertise to be included in the decision making.

Policy makers can continue to use the traditional expert–driven policy making approach and respond to the calls for greater participation by adding more comprehensive consultation processes as part of policy formulation and applying a variety of specific participative techniques (Stirling 2006). In this way, participation can be seen as improving the existing policy making approaches, adds greater democracy to the process and gives greater credibility to the policy outcomes. Lifting participation to IAP2's (2007) *Collaborate* and *Empower* levels would not occur, as it involves some level of shared decision making and would be a fundamental challenge to expert–based centralised decision making.

Many agencies responded to the calls for better participation by developing new tools and techniques to gauge and understand community values and interests, through tools like multi–criteria analysis (MCA) or multi–criteria evaluation (MCE). These are, arguably, types of decision sharing where the community is quizzed about its views and values, to be included as part of agency decision making. Of course, the agency retains the decision making responsibility and can choose to adopt whatever it chooses from the outcomes of these exercises. These tools are seen as useful in situations where the policy making involves highly subjective decisions: for example, decisions on what mix of energy sources should be used to generate electricity, where there are a wide range of views within the

community about which type of source should be favoured over another: for example, renewable vs. fossil fuels vs. nuclear (Stagl 2006). Stagl (2006:55) argues that this example involved a deliberative workshop involving members of the public, representatives from the key stakeholder groups and relevant experts to allow participants to deliberate on the central issue and to provide policy makers with, amongst other matters, the “objectives that the public considers crucial for the provision of electricity and the trade-offs between the objectives”.

Stagl (2006:55) also noted that these types of exercises can be criticised from a number of perspectives, for example, another objective of the above workshop was to find out about “the process of public debate, public information and policy making in the future and how information changed the participants’ attitude to electricity generation”. The notion that attitudes can change during participation could be interpreted as the policy makers trying to manipulate the public view by providing selected information rather than a genuine attempt to uncover community values and interests. As well, such exercises have the appearance of sharing decision making with the community, but the actual policy making occurs through a separate process that uses the information generated by the workshops to better inform the policy makers.

Policy instruments

Because the experts are the key drivers of the process, the policy instruments normally chosen are command and control or regulatory, although more recently evolutionary and passive adaptive management measures have also been used. These instruments are easily controllable by expert policy makers, unlike the market-based or voluntary instruments.

Concerns and criticisms

Critics of this approach like Cocklin et al (In Press) raise a number of concerns, most notably that command and control instruments are inflexible, interfering and inefficient. Adler (2001) examined three significant regulatory environmental programs in the USA: the Federal Superfund for cleaning up abandoned hazardous waste sites; the Clean Air Act that mandated the use of certain additives to fuels; and the Endangered Species Act aimed at protecting listed endangered species. Adler (2001:656) notes that these “are but a few examples of the harm caused by existing environmental programs, each of which costs the American people billions of dollars per year”. Adler notes (2001:659) that the key concerns regarding these regulatory approaches are:

- They impose significant costs on industry and the community with minimal environment benefits and in some cases actually cause environmental harm;
- Costs are inequitably distributed across the community;

- They divert resources away from other environmental problems where environmental gain could be much more significant; and
- Whilst they can be appropriate to straightforward environmental problems, few easy to solve problems remain.

There was also growing concern that the traditional expert-driven approach takes a far too narrow view of environmental protection. One concern was that by focusing on regulating a specific environment problem, other unintended environmental consequences of those regulatory actions emerged: for example, prohibiting one emission will force industry to change technology, but that change can lead to the emission of different pollutants (Burnett 2002). Others are concerned that agencies which adopt command and control instruments focus primarily on the environmental benefits and give little attention to the costs and economic efficiency in delivering the desired environmental outcome (Ferraro 2003).

Another concern was that once a regulatory system is established, monitoring and enforcement is required to ensure ongoing compliance. The cost of monitoring can be excessive for many smaller firms, forcing them to cease operations or forcing the regulators to give exemptions, with subsequent claims of uneven treatment (Osborn and Datta 2006). Enforcement can be difficult to achieve because of the complexities of the law and difficulties in interpretation (Demmke 2001), or because industries cannot keep up with the ever increasing number of regulations (Moreno 2001). Problems also emerge when enforcement is applied in an uneven and inequitable manner: for example, Firestone (2002:423), in a study of the enforcement practices of the US EPA noted that individuals “affiliated with small firms were seven times more likely than their large-firm brethren to be subject to penalty actions”. These smaller firms subsequently complained about being unfairly targeted by the regulating agencies.

Another concern related to perceived over-enforcement where regulating agencies develop, over time, adversarial relationships with the industries which in turn makes it more difficult to gain compliance (Osborn and Datta 2006). There are those critics who call for greater participation in decision making and are concerned that the traditional expert-driven approach, with its highly centralised and expert-driven decision making, lacks transparency and may ignore some significant stakeholders, notably the affected communities. Agencies are reluctant to broaden involvement in policy making because they believe that the community lacks both the knowledge and the skills necessary for expert decision making (Santos et al. 2006).

Despite all these criticisms, command and control instruments are still widely used throughout the developed world, even with the emergence of other approaches. Demmke (2001:26) argues that “these new instruments should not be seen as a replacement for the existing regulatory system and can work best when they complement existing regulatory programs”.

The ecological modern approach

Overview

As noted in the previous section, public concern about the environmentally damaging effects of industrialisation (e.g. pollution and loss of biodiversity) increased significantly in the late 1960s. By the 1970s the environment had become a significant political issue in developing countries and an emerging global issue. This is well illustrated by a number of international agreements signed and conferences held to address specific environmental issues through this period and into the 1980s, notably:

- The 1968 UNESCO Biosphere Conference;
- The 1972 United Nations Conference on the Human Environment;
- The 1976 United Nations Conference on Human Settlements;
- The 1979 World Meteorological Organization World Climate Conference in Geneva where human-induced climate change was the key focus;
- The 1980 World Conservation Strategy published in by the International Union for the Conservation of Nature; and
- The 1987 Montreal Protocol on managing and eliminating ozone depleting substances.

This changing community view about environmental issues can be seen as the first of three waves of change in environmental decision making starting in the 1970s (Mol 1999). Mol's second wave related to the changes in social and government institutions in response to the first wave change. Governments and industry responded to community concerns by modifying their activities and decision making to better take into account environmental concerns. Initially, policy responses involved tightening the existing command and control measures, but industry quickly became concerned that such measures would have an adverse impact on economic growth, are slow, inflexible, of questionable effectiveness and did not encourage innovation (Nicolaisen, Dean, and Hoeller 1991). The third wave related to a general community concern about the ability of regulatory agencies to deal with the emerging environmental crises/problems.

Concurrent with these broader concerns about the environment and its management was the rise of neo-liberal ideas; firstly through a variety of privately funded think tanks and institutes — proto-neoliberalism (Peck and Tickell 2002) — and then with the election of neo-liberal governments throughout the Western world (Young 2000), which, in turn, had a significant effect on environmental decision making, in particular, the introduction of market based mechanism to manage environmental impacts. Developed economies were undergoing significant change in response to both the emerging environmental awareness

in the community and the neo-liberal political change. Gibbs (2000) identified three key projects for policy makers in response to this change, being:

- The restructuring of production, and, to a lesser extent, consumption, to include ecological goals;
- Placing an economic value on nature and introducing tax reform to encourage more sustainable use of resources; and
- Integrating environmental goals into other policy areas.

This broad socio-economic change became known as ecological modernisation, which has developed into a social theory in its own right. The following section discusses ecological modernisation in more detail, but it is worth noting that whilst governments in the developed world were moving to strengthen the role of the market in economies, many in the environmental movement were becoming radicalised in response to the perceived (or actual) environmental crises and adopted a view that industrialisation, government regulation (and de-regulation) were the root causes of the environmental crisis, and only a radical shift away from industrialisation could fix the problems (Hajer 1996).

At the heart of ecological modernisation are three key beliefs (Hajer 1995). First, that industrialisation and environmental protection are not mutually exclusive, and industrialisation needed only to be adjusted to provide better environmental protection. Second, industrialisation has not created environmental *crises*, as some of the more radical elements of the environmental movement claimed, but that there were merely a series of environmental *dilemmas* that could be addressed individually and solutions readily found. Importantly, these two beliefs were used to promote the view that solutions to environmental problems could be in the form of win-win or positive sum outcomes where both the environment and the economy benefit (Davidson and MacKendrick 2004; Revell 2005). The third belief was that scientific methodology and technological advances were to be the keys to finding solutions to environmental problems: what Seippel (2000:297) has called “ecological rationality” as opposed to economic rationality.

Ecological modernisation cannot, therefore, be seen as a radical departure from industrialisation, but as an adjustment which corrects some of its faults by embracing better environmental protection. Hajer (1995) argues that ecological modernisation:

... starts from the conviction that the ecological crisis can be overcome by technical and procedural innovation... (I)t makes the ‘ecological deficiency’ of industrial society into the driving force for a new round of industrial innovation. As before, society has to modernise itself out of the crisis.

(Hajer 1995:25)

To facilitate the necessary industrial innovation significant change is required to the political and social institutions that support the economy. First, governments and businesses learn the new behaviour and language of ecological responsibility through, for example,

increased reporting of environmental performances and the setting of environmental goals (Lundqvist 2000). The importance of science in ecological modernisation is significant, as agencies attempt to quantify the environment and environmental performance through environmental and sustainability assessment and environmental and sustainability indicators. Other methodologies that developed during this time that reflect the ecological modernists' drive to quantify the environment and environmental protection included: the emergence of environmental impact assessment as a significant environment decision making tool (Partidario 1993; Shepherd and Ortolano 1996; Arce and Gullon 2000; Cooper and Sheate 2002); the ever-growing number of methodologies to assess sustainable development (Department for Environment Food & Rural Affairs and Institute for European Environmental Policy 2002; Becker 2004; WAPC 2005; Wiek and Binder 2005); State of the Environment reporting (Government of WA 1992; Commonwealth of Australia 1994); progress towards sustainability indicators (Bockstaller and Girardinb 2003; Hueting and Reijnders 2004); and the notion of ecological footprints (Lenzen and Murray 2001; Hunter 2002; Onisto, Krause, and Wackernagel 1998).

Finally, Mol (1999) argues that new social actors/agents emerged from the changing state-market relationship, notably:

- A new wave of ecologically responsible producers;
- Specialist insurance companies dealing in environmental risks; and
- Specialist organisations to handle the new certification and auditing requirements

Ecological modernisation has been best studied in mainland Europe where three distinct phases have been observed (Mol 1999; Gibbs 2006). The first phase was typified by a heavy emphasis on technical innovation, involved sustained criticism of government performance in the area of environmental protection with calls for institutional reform, and saw market forces used as the best way to deliver good environmental outcomes. The second phase placed less reliance on technical innovation, saw a move back towards government intervention in providing environmental protection as a check and balance market mechanism, and resulted in the emerging influence of social institutions and peak environmental groups on decision making through enhanced participation. The third phase involved a focus on consumption rather than production, and also saw the emergence of global issues and inter-government arrangements to manage some cross-boundary environmental issues.

Ecological modernisation has gained wide acceptance in many economies, including mainland Europe (Cook 2002; Buttel 2000; Murphy 2000) and Canada (Davidson and MacKendrick 2004). As Cohen (2006) notes:

Empirical research suggests that at least among northern European countries, policy initiatives consistent with ecological modernization have become commonplace and have contributed to some notable achievements. While it is important to maintain

perspective, there are indications that if pursued prudently this emergent paradigm is capable of fostering manifold improvements in material and energy efficiency.

(Cohen 2006:529)

In the UK there is a growing view that the ecological modern approach adopted there is a weaker version (Revell 2005), whereas in the USA there is disagreement amongst researcher as to whether ecological modernisation has had any major influence at all, with some authors expressing a view that command and control instruments still dominate (Cohen 2006), whereas others contend that market-based mechanisms dominate (Schreurs 2003). Little research has been done on the extent to which ecological modernisation has emerged within Australia, although analysis of Australia's climate change policy concluded that a weak version of ecological modernisation is at work (Crowley 1999; Bulkeley 2001).

Ecological modernisation can be summarised as a community-wide change in how institutions, both public and private, respond to the emerging environmental crises/problems, but is set within a neo-liberalist political contexts that favours market based and voluntary policy mechanisms over agency-centred command and control mechanisms.

There is now considerable research into environmental policy making since the 1990s, which suggests that ecological modern policy making has been adopted in a range of fields including: emissions trading (von Malmborg and Strachan 2005); waste management and recycling (Scheinberg 2003); energy efficiency and renewable energy (Wolsink 2007); and pollution control (Cook 2002). The key elements of ecological modern policy making are described below.

Participation and decision making

Ecological modernisation emerged at a time when public participation in all levels of decision making improved. Whilst those in the community saw improved participation as consistent with improved democracy (Patten 2001) Neo-liberal governments saw it as a way to ensure that government agencies were actually responding to the needs of individuals in the community (Pratchett 1999). Greater participation was seen as one way to reduce the negative effects that agencies were having on the market place (e.g. inefficient use of resources) by shifting the focus to individuals as consumers of the services provided by the agency. In these cases, better participation was not about improving democracy but improving the market economy.

Ecological modernisation had a particular impact on the nature and extent of participation in policy making, in particular on non-government organisations (NGOs) involved in the environmental debate. As noted earlier, as part of the changes to the political and social institutions that ecological modernisation caused, governments and businesses had to learn the new behaviour and language of ecological responsibility. Many NGOs joined this new

regime of new behaviour and language but it required that they distance themselves from the more radical elements of the environmental movement who were vocal about the inconsistencies between environmental protection and economic development and refused to learn this new behaviour and language. These NGOs become institutionalised so as to better facilitate their involvement in the environmental decision making processes.

Governments and their agencies sought to include the key stakeholder groups from business and the community in the policy making process and in many cases sought a level of participation that could be described as IAP2's (2007) Involve, where these groups were active participants in the process and had on-going involvement. This type of participation where only the elite of government, business and the NGOs are involved and not the broader community has been described as a form of corporatism (McEachern 1993; van Ast and Boot 2003).

In summary, participation as part of the ecological modern policy making approach is at a higher level than under a traditional expert-driven approach, arguably at IAP2's (2007) Involve level, but only the elite business and NGO groups are engaged, making it a corporatist Involve level of participation.

Policy instruments

As already noted, the ecological modern approach to environmental policy making favours the use of economic based policy mechanisms. Command and control measures are only used as a last resort measure as a stick to ensure industry stays within the established market framework.

The shift away from the use of command and control statutory mechanisms is matched by the increased use of specific non-statutory government agency environmental policies. Ecological modernisation practitioners contend that adopting a generic policy across a range of similar circumstances, rather than case-by-case approaches, is an effective and efficient way of addressing these issues. Fundamental to this view is the assumption that there is a single, uniform, rational and objective truth to solving those environment problems. Further, the use of agency policies is seen as being both flexible to changing needs and providing some level of certainty where a policy, once agreed to, delivers predictable outcomes for subsequent decision making. And, finally, because the ecological modern approach is based on well defined science, it creates a belief that such policies will be effective: i.e. deliver a good environmental outcome.

Concerns and criticisms

Notwithstanding the growing application and analysis of the ecological modern approach to environmental policy making, acceptance of this approach in the broader community has not been universal. Further, some writers report mixed success of these policies. For

example, von Malmborg and Strachan (2005) conclude of the UK Government's use of the ecological modern approach to emissions trading:

... it seems that instead of providing a tool that effectively favours ecological restructuring and reform, the UK ETS leaves the government with a tool that favours the status quo in the long run. It hardly safeguards real emission reductions and it provides no signal to industry for structural change. The increasing use of ecological modernization vocabulary in the talk of UK climate policy-making has not been accompanied by related developments in policy action and development of appropriate policy instruments.

(von Malmborg and Strachan 2005:155)

Opponents from within the environmental movement object in principle to the notion of effectively buying the right to pollute, and raise concerns about the ethics of valuing the environment at all (Cook 2002). Some regulatory agencies, despite the support of the government of the day for the ecological modern approach, opposed de-regulation because they have developed specialist expertise in how to apply command and control mechanisms, and with the power shift from the State to the private sector considerable tensions within government emerged (Keohane, Revesz, and Stavins 2000).

Some critics are concerned that ecological modernisation has been used to absolve industry of its responsibility to fix the environmental degradation it has caused, and masks the basic inconsistencies between business as usual and environmental protection (Gibbs 2006). For, example, pricing environmental resources or putting a cost on pollution, if done properly, would have significant effects on the economy and the cost of some basic goods and services. The price of energy would need to increase significantly to reflect actual environmental impacts, but governments are unwilling to impose the full costs because of the political implications. Consequently, businesses wear some but not all of the costs, they are seen to be addressing the problem, but environmental degradation continues. Critics like Revell (2005:357) see this as bowing to consumer sovereignty where only the supply side of the economic equation is tackled, and ecological modernisation is seen as “a narrow, supply-sided approach to finding more sustainable means of achieving the same ends — continuing growth in consumer demand and GDP”.

This type of criticism has led some to conclude that ecological modernisation can be both weak and strong (Revell 2005; Gibbs 2000; Christoff 1996), where weak ecological modernisation ignores the radical social and institutional changes, is less democratic and more technocratic, and focuses on the economic rather than the environmental. It results in what Christoff (1996:486) calls the “green gloss on industrial development” without actually delivering sustainable environmental benefits and changes.

Others are critical because they see the ecological modern approach as allowing governments to be *seen* to be doing a great deal but actually doing very little. A key promise of ecological modernisation is that it should deliver institutional change.

Governments can use the language and processes of ecological modern policy making so that it appears to the community that change is being proposed or discussed, but little actual change is proposed: what Davidson and MacKendrick (2004:62) call “a process of discursive reframing rather than institutional restructuring”. They argue that the use of ecological modernisation as a policy process leads to a final policy outcome that

... is a form of reconstructive policy discourse allowing government to define away the contradictions between excessive resource development and environmental well-being, rather than address concerns about the pace of development. In short, the government succeeded in changing what is “said” without changing what was “done”.

(Davidson and MacKendrick 2004:62)

Another concern is that with increasing globalisation, free market approaches can only work where affected governments have similar and complementary supporting regulatory approaches (Sonnenfeld and Mol 2002). In the absence of this, businesses will simply shop around to find the governing regime that offers the lowest cost: that is, lowest environmental regulatory requirements.

The nature and extent of participation as part of ecological modernisation has also been criticised by some observers. Firstly, the focus on peak or elite participation excludes local community and environmental groups. Further, Gibbs (2000) argues that the focus on market approaches and the reliance on proven science and technology result in the

... ignoring of issues of participation and reducing the rest of society to passive consumers to be provided with enough information to make informed (but market-based) choices.

(Gibbs 2000:17)

A final concern is that ecological modernisation has focused primarily on controlling toxicants and chemicals and has been unsuccessful in dealing with the broader and more socially problematic green issues of conservation and broad ecosystem management (Buttel 2000). This is in part due to the importance of science and technology to ecological modernists, with the science of toxicants and chemicals relatively well understood. It is also worth noting that whilst the issues of toxicants and chemicals raise some public debate, usually on a case by case basis, the primary concern of most environment groups is on these broader conservation and ecosystem management green issues rather than the brown toxicant issues. These are also the areas where conflict is most intensely felt as part of policy making. It will be argued below that ecological modernisation and the role of markets have limited relevance to environmental policy making in contexts where conflict is endemic.

The collaborative approach

Overview

This approach has strong parallels to Vigar and Healey's (2002) collaborative/deliberative/interpretive process. As noted at the beginning of this chapter, the collaborative¹ approach to policy making and management has its parallels in the communicative turn in planning. Collaborative environmental policy making involves some level of local decision making on the environmental issue of concern, which, as argued by Meadowcroft (1999),:

... is a form of social regulation in which groups originating in different spheres of social life, which reflect distinct perspectives and interests, participate in debate and negotiation to implement a collective plan for the resolution of a specific problem.

(Meadowcroft 1999:230)

This collective plan is often a policy, which, according to Meadowcroft, has six central features:

- The policy making process involves participants collaborating from more than one sector of social life;
- The process involves representation from organized interest or groups rather than individual participation;
- The groups represented are a cross section of the groups that have an interest in the issue;
- The policy making process involves "discursive consensus formation" where members exchange ideas and experiences, learn from each other and agree on the nature of the problem and potential solutions;
- Each partner agrees to take part in or contribute to actions that address and solve the problems; and
- The policy includes a mechanism for reviewing the original agreements made.

The collaborative approach has been applied in a range of different circumstances, including: water catchments, (Leach, Pelkey, and Sabatier 2002; Lloyd et al. 2000); forests (Brown 2002); urban air quality and regulating industrial emissions (Harrison 1995; Busenberg 1999; Poncelet 2001; Ryan 2001; Woodfield et al. 2006); the paper industry (Lober 1997); agriculture (Koontz 2003), (Keough and Blahna 2006; Raik, Decker, and Siemer 2006); fisheries management (Kitts, Pinto da Silva, and Rountree 2007); ocean and marine planning (Rutherford, Herbert, and Coffen-Smout 2005); and recreation in national parks (Daniels and Walker 1996).

¹ The terms 'cooperative' and 'collaborative' are used interchangeably in the literature. The term 'co-management' has also been used to mean cooperative-collaborative.

In Australia the collaborative approach is used across a range of environmental policy areas. The Australia Government has proposed a national cooperative approach to coastal policy and management, in part because of the fragmented policy and management responsibilities across the three tiers of government (Intergovernmental Coastal Advisory Group 2004). Management of salinity in Australia is now fundamentally a catchment-based community-centred process which is now widely acknowledged as involving a highly formalised collaborative approach (Curtis, Byron, and MacKay 2005). The regional forest agreement process, whilst highly contentious, has also been viewed as a collaborative exercise (Brown 2002).

The rise of the collaborative approach has been so rapid and widespread that Koontz and Thomas (2006:111) suggests that if “the 20th century was the era of the administrative state, then the 21st century may be the era of the collaborative state”.

Participation and decision making

Central to the collaborative approach is the setting up of a peak working group or committee to facilitate cooperation and oversee policy making. Whilst policy elites who dominate decision making under an ecological modern approach can be represented on these bodies, more typically most collaborative exercises are locally based and involve local, not the peak, environmental and industry groups (e.g. farmers, local residents, local industry and fishers). There is some evidence that if the cooperation is only at the corporatist level, policy making will be unsuccessful (Lubell 2004).

As noted earlier, participation in the collaborative approach goes further than just considerations of who should be involved in the process: there is evidence of at least *implied* if not actual shared decision making with the collaborative body. The peak collaborative body usually makes decisions through consensus (Innes and Booher 1999), and whilst it usually has an advisory and not a formal decision making role, it is politically very difficult for the decision making agency to ignore the consensus agreement of the peak body. Interestingly, in one case study of forest management in Queensland, a collaborative agreement that was established outside the formally established decision making process of the Commonwealth government, operated successfully without the need for government approval, and in spite of Commonwealth government disapproval (Brown 2002).

Participation in the collaborative approach is at least at IAP2's (2007) Involve level, but usually at the *collaborate* level where decision making is shared, either directly or implied.

Policy instruments

Some authors see the increased use of this approach as governments withdrawing from environment policy and management because of the neo-liberal changes in the 1980s (Hall 1999; Plummer and FitzGibbon 2004). Whilst this may be true in part, the key to the collaborative approach is that it focuses on the *processes* of policy making and

implementation rather than favouring particular types of policy mechanisms — for example market mechanisms — which is not what would be expected under a neo-liberal political framework. Where the traditional expert-driven approach uses typically highly prescriptive mechanism (command and control) and the ecological modern approach uses market based mechanisms, collaborative policy making can lead to a diverse range of mechanisms being agreed to, drawing from command and control and market mechanisms as well as other more innovative ones, depending on the specific environmental and social context (May 1995; Lubell 2004). Further, the incentive for stakeholders to be involved in collaborative exercises is about a general desire to cooperate rather than a preference for a market-based economic approach. In other words, industries chose to be involved in a collaborative exercise to achieve both social and economic outcomes whilst at the same time addressing the environmental concerns of other stakeholders. A primarily neo-liberal approach will only focus on economic outcomes.

Concerns and criticisms

Margerum and Whitall (2004) are cautious about collaborative exercises and identify several dilemmas or weaknesses of the collaborative approach. The first dilemma is the choice of the level of participation: that is, whether it should involve central or local groups and representatives. The collaborative approach favours a local over centralised process, where local stakeholders make place-based policy decisions. This has the potential to generate a whole range of different policy and management outcomes depending on the location, making it difficult to create a single legislative approach to support these varying processes. Margerum and Whitall noted that without the strong legislative support, one of the key incentives for industry to be involved in and comply with the policy outcomes disappears. Although as one critic notes, businesses may well favour local approaches to centralised agency-run responses because as one company spokesperson said to the critic “I don't want bureaucrats telling me how to run my business; I would far prefer to take my chances with people from the community” (McCloskey 1996:2).

The second dilemma relates to the use of knowledge and the contention that on occasions the normally knowledge-based decision making gives way to more politically-based decision making. Leach *et al* (2002) examined 44 case studies of collaborative management (through formal partnerships) in catchment management and noted that few, if any, of these case studies collected any data to measure environmental change and policy effectiveness:

Unfortunately, few partnerships conduct the long-term pre-project and post-project monitoring required to separate the partnership's effects from the effects of other forces within or outside the watershed, or from natural fluctuations.

(Leach, Pelkey, and Sabatier 2002:653)

The driving imperative in these cases was to develop an agreed policy, and the need to have a comprehensive knowledge base in support of policy was a secondary consideration. This process of marginalising the science and information threatens the credibility of the final policy outcomes.

The third dilemma relates to the scale of participation. As discussed above, the collaborative approach favours local participation over regional and peak conservation groups. As McCloskey (the then Chair of the Sierra Club) noted, several problems emerge where only local based environmental groups are part of the participation. Firstly, local rural based groups may well have different environmental agendas to urban environmental groups. The peak NGOs may take a more strategic view of environmental protection whereas local groups will focus on the localised issues and be unable to make more strategic trade-offs. This sets up a potentially significant source of tension as the peak NGOs may be seen as not giving local environmental concerns the appropriate weight. Secondly, local environmental groups may not have the skills and experience to negotiate with industry and government for better environmental outcomes. Local groups often lack the resources to obtain additional environmental information that might be useful in the policy making process. The peak groups, on the other hand, are well practiced and resourced to take on industry and government in tough negotiations, but may not understand the significant local issues and may trade-off these for more strategic gains.

Some see collaborative policy making as not being inclusive of all relevant stakeholders, thus threatening the credibility of the whole policy making process. For example, a study of participation in the management of US forests found that the logging companies were not always involved in the collaborative management of forests, with 26% of companies electing not to participate (Brody et al. 2006). Leach (2006), in a study of effectiveness of participation in collaborative management in catchments in western USA, found that the most common criticism of participants was in relation to the representativeness of those involved. Participants often believed that either important stakeholders were not included, or were included but did not participate sufficiently in the process for their input to be meaningful. Others were concerned the participation in collaborative exercises focus on the corporate elites (Pinkerton 1999).

The fourth dilemma relates to ecological vs. political timeframes, although this can be a concern irrespective of the policy making approach adopted. The participants in a collaborative approach are usually involved for long time periods because of their direct interests in the environmental issue. Governments can change during these timeframes and bring different emphases as expressed through agency participation. This can undermine the trust that may have been built during the process where agreements and understandings achieved at one point in the policy making process are subsequently challenged when a government changes.

The final dilemma is one of resources. A collaborative approach is both time and resource hungry. Agencies, in particular, are often forced to reallocate resources from one environment priority to another, which can create tensions both within that agency and the environmental community affected by the resource reallocation. Collaborative participation also requires agency staff to use a set of skills that many do not possess, particularly those used to operating in a traditional expert-driven or ecological modern policy context: for example, negotiation and other inter-personal skills. This dilemma is further complicated under neo-liberalist governments which believe the extent of government involvement in policy making should be reduced not increased. An emerging problem is that of community resources. Community participation in these exercises is voluntary, and there is growing evidence of community burn-out and fatigue as only a few in the community are asked to be involved in more and more of these collaborative exercises (Bell 2004).

Another concern for some authors is the lack of hard research done on the measured outcomes of collaborative exercises. One study examining the demonstrated outcomes of a range of collaborative exercises (Koontz and Thomas 2006) found that whilst criticisms and support for the collaborative approach were frequently reported in the literature, little actual research had been done on two critical questions:

- Do collaborative processes produce different outputs than other processes? and
- Do collaborative outputs produce better environmental and social outcomes?

The study found that whilst *social* outcomes had generally been positive, there was little credible data on the *environmental* effectiveness of collaborative approach and

In order for collaborative environmental management to be deemed a success, we must have a solid base of evidence that it improves – or at least does not worsen – environmental conditions when compared with other management approaches. In the absence of such knowledge, collaboration may do more environmental harm than good. Moreover, failure to establish evidence of environmental improvements might dissuade the use of collaboration in cases in which it could be effective.

(Koontz and Thomas 2006:118)

Kenney (1999) also noted that measuring the effectiveness of collaborative exercises is difficult, primarily because it usually takes a long time to measure environmental improvements in ecosystem-wide (in this case, catchments-wide) environments. He goes on to note that social measures of success are easier to measure, including:

... improved relations and trust among stakeholders and managers; increased communication among relevant parties, including an expanded role of local parties in decision making; establishment of new processes of planning and management.

(Kenney 1999:34)

Kenney (1999) noted, however, that there is a risk that success in this area may well lead to a masking of the environmental performance of the exercise. He argues that:

Building personal relationships among historic adversaries ... encourages difficult issues to be ignored (as they might threaten newfound friendships), or worse yet, to be addressed through inappropriate compromises.

(Kenney 1999:34)

In short, improved relations between groups who were previously in conflict can come at the cost of real environmental improvement.

It is fair to say that most studies on collaborative examples note that problems do emerge and need to be addressed. One of the keys to overcoming these barriers to success is the presence of strong leaders or policy entrepreneurs who successfully manage the required institutional changes (Heikkila and Gerlak 2005). These leaders act to mobilise resources, motivate participants, build trust, keep lines of communication going and become what Heikkila and Gerlak (2005:586) call the “vital spark for collective action”, thus providing the social capital needed for these collaborative exercises to work.

The adaptive–collaborative approach

Overview

Analysis of the literature suggests that practitioners of adaptive management are in one of two schools, depending on the nature of the policy making adopted and the use of science. On the one hand, there is the expert–based school which favours the use of adaptive management as a tool for existing decision makers and takes a predominately scientific view of the information and the resulting analysis (For example: Moore and Conroy 2006; Busenberg 2004; Enck et al. 2006; Linkov et al. 2006; Rivers-Moore and Jewitt 2007). In effect, this school sees adaptive management as a scientific tool in support of the traditional expert–driven approach to policy making, as noted earlier.

On the other hand there are those who contend that adaptive management needs to be supported by a collaborative approach involving a wide range of stakeholders and the broader community in decision making. Further, this school recognises a more holistic view of the science and information to be used as part of the process where local and indigenous knowledge is seen as just as important as scientific knowledge (For example: Jacobson et al. 2005; Gold 2002; Marttunen and Vehanen 2004; Habron 2003). The latter approach has been called adaptive and collaborative environmental management (Luke 2002) and adaptive co–management (Plummer and Armitage 2007). This combination of a policy making process and policy mechanism is seen by Plummer and Armitage (2007) as a powerful incentive to ensure institutions (public and private) learn as part of policy making, and powerful incentive to generate new knowledge about the environment in question and its management:

Synergies between the concepts of collaboration and adaptive management yield a community-based system which encompasses complex cross-scale linkages and the process of dynamic learning.

(Plummer and Armitage 2007:63)

For this reason, collaborative policy making that adopts adaptive management (called here adaptive-collaborative) can be seen as a different policy making approach, and is of most interest to this study. It will be argued below that this approach is more likely to be successful in dealing with highly contested environmental policy making contexts than the other approaches, even if those expert-based approaches (traditional expert-driven and ecological modern) adopt adaptive management as a policy tool.

For clarity, the term *adaptive-collaborative* will be used in reference to the policy making approach and *adaptive management* will be used to in reference to the policy mechanism (tool or instrument).

Proponents of the adaptive-collaborative approach identify a range of reasons why many modern policy making contexts do not lend themselves well to the traditional approaches (traditional expert-driven and ecological modern). First, most natural systems are not well understood with only limited environmental data available to inform policy makers. Second, the systems of most concern to policy makers are those that are subject to significant existing human pressure, and these systems are constantly changing and never reach a state of equilibrium. Further, given the complex nature of these systems and the natural variations, it was unlikely that they would ever reach equilibrium if left undisturbed anyway. Thirdly, community attitudes towards the management and protection of these areas are varied, complex and constantly changing (Pagan and Crase 2005). Critically, however, the key driver for the use of adaptive management is that, despite this lack of data, the complexity and constantly changing nature of the environment and changing community attitudes, delaying action until our understanding is improved is not an option because there is considerable pressure for development (Bennett et al. 2005:70).

The nature of learning is more complex in the adaptive-collaborative approach. Whilst social learning is important (as it is in a collaborative approach), technical learning is crucial to the adaptive-collaborative approach and requires all participants to learn from experience (monitoring and modelling) so that decisions about on-going management are better informed. In this sense learning is on-going. As Clark (2002:1) notes, an adaptive-collaborative approach is much more than previous iterative decision making or muddling through approaches (including Trial and Error and Passive Adaptive Management), and “advocates treating management policies as experiments, which are then designed to maximise learning rather than only immediate resource yields.”

Whilst there is now considerable literature on adaptive management and a growing literature on the adaptive-collaborative policy making approach, there are few studies where success has been recorded (Jacobson et al. 2005), and doubts remain about its

effectiveness. To be fair, adaptive–collaborative exercises are used for the management of complex ecosystems which would likely take decades to show measurable environmental improvement, and it is likely that not enough time has yet passed for most of these examples for monitoring to show that improvement has or has not occurred. These doubts and concerns will now be discussed.

Participation and decision making

As with the collaborative approach, participation in the adaptive–collaborative approach is at least at IAP2's (2007) Involve level, but usually at the collaborate level where decision making is shared, either directly or implied. In many cases the adaptive–collaborative approach offers an additional opportunity for community participation where the data collection can be complementary to the overall participation process. The community can be involved in collecting and contributing to the data upon which adaptive decisions are made. In some cases it involves training local residents in how to collect data (Dallmeier, Alonso, and Jones 2002), in other cases existing users are required to provide on–going information as part of monitoring (Klooster 2002).

On–going involvement of the community is essential as the policy is being implemented because it is likely that decisions need to be made about choices of management options in response to the environmental monitoring (see below).

Policy instruments

As with the collaborative approach, certain types of instruments are not particularly favoured, and the initial decision on what instruments to adopt is chosen through collaboration. Importantly, adaptive–collaborative policies have to be flexible in that they do not lock in the use of certain instruments, but allow for flexibility in management responses so that if monitoring detects changing environmental conditions that were not anticipated, different or revised instruments can be employed to adapt to these changing circumstances.

Concerns and criticisms

For the most part, concerns relate to adaptive management rather than to the adaptive–collaborative approach as such. Johnson (1999:2), for example, notes that there are four key difficulties in implementing adaptive management successfully:

- Difficulties in developing acceptable predictive models,
- Conflicts regarding ecological values and management goals,
- Inadequate attention to non–scientific information, and
- Unwillingness by agencies to implement long–term policies seen as too risky or costly.

He notes that the first difficulty is a technical one which can be overcome with more resources (this is discussed further below). In relation to the second and third difficulties, Johnson argues that these come about because of inadequate participation so that the conflicts over values and goals are simply not addressed, because decision makers avoid considering the non-scientific sources of information. On the last difficulty, Johnson notes that many agencies are inflexible in dealing with new situations that carry higher than usual uncertainty, which Bormann et al (2007:188) argue can be a source of some frustration for adaptive-collaborative practitioners, where "if precaution continues to trump adoption, adaptive management will be hindered".

When faced with heightened uncertainty, these agencies prefer to apply traditional and known policy options rather than alternative measures that carry extra risk, even if those traditional options have been shown to be unsuccessful in dealing with uncertainty. Agencies may use the existing legislative and regulatory framework as a barrier to allowing alternative management options (Stankey et al. 2003; McAlpine et al. 2007). For example, the risk that a management regime could cause harm to a specific species or possibly lead to elevated levels of contaminants in surface water or groundwater is used as a reason for agencies to invoke regulations to block alternative actions.

Of course, it is not just agencies that express concerns allowing more risky management and policy responses when faced with heightened uncertainty. The community and other stakeholders, including politicians, often use precaution as an argument not to proceed (McAlpine et al. 2007:588). Several authors considered these issues as a lack of institutional learning (Dallmeier, Alonso, and Jones 2002; Jacobson et al. 2005). Clarke (2002) notes that typically

Most institutions are not very good at learning, especially when such learning would entail significant revision of their own goals and operating procedures. Environmental management institutions are no better than the norm and maybe significantly worse.

(Clark 2002:1)

This institutional learning difficulty can be significant when, as often happens, the monitoring turns up surprises, where the results do not fit the predicted modelled outcomes. Agencies and scientists can discount these surprises as aberrations and ignore the implications for the on-going management of the resource.

Cost is also a significant issue when applying the adaptive-collaborative approach or adaptive management. Modelling, monitoring, data collection and analysis can be expensive, reporting requirements can be onerous, and time spent on the collaborative side of the exercise can place significant strains on all players (Lee 1999; Bormann, Haynes, and Martin 2007). Agency staff are often not given the necessary training and resources to deal with increased demands (Stankey et al. 2003).

Some critics hold a more fundamental concern about adaptive management and the adaptive–collaborative approach. As already mentioned, one of the fundamental premises of adaptive management is that it is the most useful tool to apply in situations where the catchment or resource in question is under considerable development pressure, our understanding of how that ecosystem works is very poor, but the pressure to develop is irresistible. Luke (2002) argues that adaptive management has:

Come into being because almost everyone continues to desire the goods and services made possible by the global economy's burgeoning productivity, even though these material outcomes are getting more difficult to realise because of either mass resistance to many industries' by-products or actual physical scarcities caused by resource depletion.

(Luke 2002:21)

In short, adaptive management does not address what many see as the fundamental conflicts between environmental protection and continued economic growth. Worse, however, adaptive management is proposed as an innovative way for both industry and governments to be seen to address real environmental problems in a pre–cautionary way but the outcome will be loss of environmental quality.

Some like Luke (2002) remain sceptical that adaptive management is really any different to previous management approaches:

Adaptive management is a fairly conventional set of expert anchored ecomanagerialist practices, which has been made more open to popular participation while becoming self–certain about its own infallibility.

(Luke 2002:16)

Notwithstanding these difficulties and criticisms, the adaptive–collaborative approach offers considerable promise in dealing with environmental policy making contexts that have deeply embedded conflict. These benefits will now be discussed.

Policy making approaches and conflict

This final part of the Chapter discusses the potential for each of the policy making approaches to deal with conflict.

Traditional expert–driven approach

Social conflict

The traditional expert–driven approach has a fundamental problem in dealing with policy making contexts where conflict is endemic: the prescriptive nature of the approach means

that to ensure compliance all the key stakeholders must agree to the nature and extent of the prescriptions. For this to occur, the interests, values and goals of the stakeholders must be in reasonable alignment. In effect, any differences in these values, interests or goals need to be resolved prior to implementation. The expert-based decision making typical of traditional expert-driven policy making will have limited success when the values, interest or goals of the non-experts who want to be part of the process are different from those of the decision makers.

Governance

The same can also be said in relation to governance: if there are problems with governance (for example, the regulatory agency is not trusted by industry or the community, or there are overlapping responsibilities between different levels of government), then it is unlikely that the policy will be successful.

Science and information

In relation to possible conflicts over science and information, the prescriptive nature of traditional expert-driven policy making means that it works best when the science in support of the policy is relatively clear and uncontested. If the science is unclear and the subject of some debate, then compliance with, and support for, the policy would unlikely be forthcoming. This is because the version of science used in support of the policy would be seen as being chosen over other versions, and those supporting those other versions are unlikely to support the final policy.

Summary

The traditional expert-driven approach could be applied successfully where levels of existing conflict are relatively low or the conflict can be managed and resolved prior to, or as part of, the policy making process. It is likely to be unsuccessful, however, in circumstances where there is a need for greater public involvement in decision making, where competing interests and values need to be resolved, where the environmental problem is complex involving high levels of uncertainty and/or where conflicting governance issues emerge. In short, the traditional expert-driven approach is unlikely to be successful in highly contested policy making contexts.

Ecological modern approach

Social conflict

Ecological modernisation is more promising as a policy making approach in dealing with conflict than the traditional expert-driven approach. The shift of emphasis away from government regulators to other actors and market mechanisms as the means of delivering

environmental control is likely to encompass a wider set of interests and values, most notably those of industry. In this way, the resistance of industry to comply with policy is reduced, thus reducing overall state–industry conflict. The inclusion of the major environmental NGOs within the process should also ensure that some of the values and interests of these groups are included within policy making. The absence of involvement from local community and environmental groups, however, limits the ability of this approach to address these more local social interests, values and goals. As well, it is likely that the radicalised elements of the environment movement will become more alienated by the corporatist approach to participation; thus, whilst conflict as part of the policy making may be reduced, conflict from outside the process could be enhanced.

Governance conflict

The ecological modern approach reduces the influence of regulators and could actually reduce any existing governance conflicts by avoiding the need of agency governance partially or entirely. Reliance on market and voluntary mechanisms can marginalise some governance issues that might otherwise emerge. Of course, they will not be removed entirely as the government still has a role to play in setting the framework within which the market and voluntary mechanisms are to operate. Any governance conflicts will still need to be addressed, but it should be possible to address these concerns more easily than with a traditional expert–driven approach. On the other hand, marginalising regulators so that they are no longer central to policy making may well create conflict within government, as these individuals and agencies seek to re–assert their influence within policy making.

Science and information

As with traditional expert–driven policy making, science is central to ecological modern policy making, and the concerns raised early in the discussion of the traditional expert–driven approach apply here as well. That is:

- Where the science is uncertain and contested, ecological modernisation requires that a version of the science be adopted as the central core of the policy making;
- The version of science that is chosen will be seen by those who choose an alternative version of science to be value–laden (i.e. the policy makers have chosen one set of values over the others);
- Any prescription (e.g. standard) selected based on the version of science chosen will inevitably be challenged by those who hold an alternative version; and
- Any scientific uncertainty has to be ignored or described as background, which simply masks, but not addresses, the issue.

In short, ecological modernisation requires that any uncertainty associated with the science be ignored and the subjective elements of decision making effectively denied.

The use of complex scientific methods and language to report various aspects of the environment (for example indicators and multi-criteria analysis) may have an additional effect of alienating many in the community because of this complexity. Suspicion of these methods is enhanced where the studies suggest environmental improvement is occurring but communities and individuals experience or perceive the opposite. Clearly, ecological modernisation gives little weight to types of knowledge that are not scientific, for example, the local and indigenous knowledge. The elevation of scientific knowledge over other forms of knowledge in contexts that are highly uncertain and contested will likely, therefore, enhance any underlying conflict rather than deal with it.

Summary

Whilst an ecological modern approach offers greater promise in dealing with highly contested environmental policy making contexts than the traditional expert-driven approach problems remain. In short, the ecological modern approach to policy making is likely to have limited success in highly contested environmental policy making contexts, although would likely be more successful than the traditional expert-driven approach.

The collaborative approach

Social conflict

There is reasonable consensus amongst writers in this field that the collaborative approach has been used successfully in cases where there is considerable conflict on how the resource in question should be used and managed (Ebbin 2004; Lubell 2004). This type of conflict centres on the differences in values different groups have about and that resource and its uses. As Paulson (1998:302) notes in relation to managing rangelands in Wyoming, a collaborative approach “attempts to incorporate the values and interests of diverse stakeholders in the management of rangelands.”

As discussed above, management of fisheries can lead to significant conflict where the resource is either limited or in decline. A collaborative approach in Victoria, Australia, is seen by Kearney (2002:212) as “a major step in resolution of conflict between commercial and recreational fishers in Victoria”.

One reason that the collaborative approach can achieve success is that it can lead to improved trust between all stakeholders: for example, Pinto da Silva and Kitts (2006) note that in the case of fisheries management in the Northeast USA:

The success of all forms of collaborative management is dependent on trust and the sense of partnership between different participants. Cooperative research and other forms of collaboration are good steps towards building the necessary trust that will

encourage a sense of stewardship of marine resources and enable innovative alternative governance initiatives to emerge.

(Pinto da Silva and Kitts 2006:840)

Another reason why conflict was reduced in these exercises is that social learning occurs (Innes and Booher 1999; Bouwen and Taillieu 2004). Daniels and Walker (1996) argue that:

Learning (in the collaborative approach) is an inherent feature of public policy decision making. It is how people discover the range of public values and how those values can complement and conflict with each other.

(Daniels and Walker 1996:73)

Collaborative policy making allows different groups to interact, understand the perspectives of other groups with competing interests, make some concessions, get concessions in return and, in these ways, conflict is reduced. In a study of behaviour observed by participants in collaborative case studies, Poncelet (2001) made three key findings in relation to learning:

- Organizational design of the partnerships provides experiences, ways of thinking and perspectives that few of the stakeholders have previously experienced thus providing the context to allow social learning, cultural production (specific to the group) and identity change to occur;
- Many of the participants held similar understandings or a commonly shared cultural view about how the partnerships should work; and
- Personal transformations do take place.

Recent work by Keen, Brown and Dyball (2005) proposed a social learning framework within which to view participation in management and policy making, as described below. In this framework, learning, or the lack of it, is central to participation and defines the levels in the participative ladder. Six ladder levels are defined:

- Coercing – involving a forced learning where the will of one powerful group is imposed on other groups;
- Informing – one way learning where information flows from the decision making group to other groups;
- Consulting – limited learning by decision makers where information is sought from the non decision making groups but the decision makers maintain the power to make ultimate decisions;
- Enticing – shared learning amongst various groups with an interest in decision making but the decision makers maintain overall power and entices agreement from other groups through incentives;

- Co-learning – learning occurs at all levels as part of decision making, policy and plans are developed cooperatively and decision making carried out through negotiations; and
- Co-acting – learning and knowledge sharing occurs within a community with minimal involvement from outside decision makers. Here, the affected groups control action and decisions outside normal decision making processes.

Social learning is more than just the technical, science-based learning that takes place as part of ecological modernisation. Keen et al (2005:9). argue it is a “process of iterative reflection that occurs when we share our experiences, ideas and environments with others”.

If social learning does occur in collaborative exercises then conflict, at least over values and interests, should reduce. Some other authors, however, sound a word of caution here. Lubell (2004:565), for example, warns that successful social outcomes of collaborative exercises (i.e. reduced conflict amongst participation stakeholders) may be symbolic only and that a “perception of consensus, without the behavioral follow-through” may result instead. Lubell is concerned that not only does consensus mask unresolved underlying conflict, but, more importantly, by not addressing this underlying conflict, environmental effectiveness of the policy is questionable.

Governance conflict

It is possible that governance conflict in a collaborative policy making exercise could either increase or be better managed, depending on the circumstances. Conflict could be expected to increase because collaborative approaches usually involve a shifting of decision making from the regulating agency to the collaborative peak group. Some regulators may resist this change, leading to increased tensions with the collaborative peak group. Most authors, however, have noted that the use of the collaborative approach has led to a lessening of tensions. For example, conflict in the management of marine areas and fisheries is often between the users and the management and regulating agencies, where the licensing and allocation of the resource can be seen as unfair and over prescriptive. Effective collaborative approaches have addressed this type of conflict, provided the management and regulating agencies participate in the exercise and adjust practices as required (Mow et al. 2007). The key here is that the regulating agencies must be willing to take part in the exercise and also be willing to modify the way they regulate depending on the outcomes of the collective decision making of the group. Where regulators do not willingly participate, then governance conflict will remain and possibly be enhanced.

A case can be made that in examples where there is either a breakdown in governance or where competing governments have jurisdiction over the environment in question, the collaborative approach can fill the void of that breakdown in governance. Alternately, the collaborative approach can provide a forum for different levels of government to get

together to address competing interests. It is more likely, however, that the different governments will work out differences outside the collaborative forum, but it is the presence of the collaborative exercise itself which is the driver for those governments to seek resolution. In a similar way, tension between different agencies can also be worked out through the process, and the collaborative exercise provides the agencies with the opportunity to build trust with other stakeholders. The concerns that remain relate to the potential lack of resources available to key agencies to be involved in the exercise, and a lack of willingness of these agencies to give up some of their decision making roles.

Science and information

Some writers see the collaborative approach as a useful way to manage conflict over science and information. Heikkila and Gerlak (2005:587) argue that the conflict is over the science is central to most modern policy making exercises, and whilst different stakeholders may bring to the policy making table a range of different information and science, the collaborative approach “can play a key role in bringing diverse stakeholders together by acting as a neutralising force for value differences”. Here, conflict over science is seen as an extension of conflict over values. Bringing the different stakeholder groups together provides a mechanism to address these value-laden interpretations of the science.

Margerum and Whitall (2004) note, however, that in many cases alternative sources of information other than traditional science are put into the policy making mix, which creates different tensions. The community participants will expect their local knowledge to be given equal consideration to the scientific knowledge, and be integrated in the policy making process (Ransom and Ettenger 2001; Ebbin 2004). As Martin (2003) notes:

... since the 1970s, there has been a reassessment of the value of local knowledge, leading to calls for participatory policies and projects in which local and expert knowledge are brought together in complementary way.

(Martin 2003:57)

He goes on to note that the reluctance of experts to accommodate local knowledge is a significant barrier to good policy making as the experts continue to assert the primacy of their own knowledge and that this hinders the achievement of management objectives (Martin 2003:57). So, whilst the community conflict may be reduced because the collaborative approach allows local and indigenous knowledge to be included in the policy making process, the proponents of traditional scientific knowledge (the regulating agency and industry) may resent this equal treatment. Of course, community conflict will re-emerge if the local knowledge is only given token acknowledgment.

The discussion so far assumes that there is either some consensus about the science that supports the policy making or that the debate is over the relative importance and usefulness of the different sources of information. The capacity of the collaborative approach to deal with contexts where there are high levels of uncertainty associated with the science is more

problematic. In these cases, there are likely to be differences of view about decisions that can be made because of this uncertainty as well as differences over how to address the information gap. Whilst the collaborative approach allows social learning to occur, unless adequate technical learning occurs to address the uncertainty issue, so that some level of consensus about the nature of the problems and the solutions that can be applied is achieved, conflict will remain. A collaborative approach can deal with the differences in values that form the bases of the different views on the science and information, but may not be able to deal with high levels of uncertainty in the science itself.

Summary

The collaborative approach is likely to succeed in circumstances where there is significant conflict over values, interests and goals. Addressing governance conflicts could be more problematic, but the collaborative approach offers some hope in this regard: however, dealing with contexts with high levels of uncertainty becomes more problematic, and unless adequate technical learning occurs throughout the policy making process to address the uncertainty. This is where adaptive management can have a role to play as part of a collaborative exercise.

Adaptive–collaborative approach

Science and information

The adaptive–collaborative approach will have all of the advantages of the collaborative approach in dealing with conflicts over values and interests and governance. The use of adaptive management as a policy making tool means that conflict over uncertainty and science is dealt with directly, which the other policy approaches ignore. It should be noted, however, that the three types of adaptive management identified above deal with science and information issue slightly differently and, as a result, any conflict. Each, though, has built in mechanisms that address any conflict over the science and information.

The evolutionary approach, as noted earlier, is best applied where little, if any, environmental data exist, where the system is both robust and of low significance and the risk of significant environmental harm is very low. It is the low risk of significant environmental harm that normally ensures that the level of conflict is reasonably low despite there being likely disagreement over the science and information.

Passive adaptive management is also used in cases where there is low risk of significant environmental harm because there is a high degree of certainty that the agreed management responses will succeed (the level of understanding of the system is high). In this case, however, whilst the risk of environmental harm is low, the consequence of management failure is significant because the system is both environmentally significant and very susceptible to change. The level of conflict, therefore, is much greater than with

the evolutionary approach and is managed by having a comprehensive monitoring system that would enable any unexpected impacts to be detected early and suitable changes to management made. In reality, conflict is not over the science but is over the value of the system and whether the consequences of management failure mean that the development should not proceed in the first place.

Active adaptive management is used in cases where there is uncertainty about the science and information in support of policy making (low level of understanding of the system), and the system's sensitivity to change is relatively significant (risk of significant environmental harm is relatively high). The levels of conflict in these cases will be high and the only way to move to an agreed policy response is to acknowledge that new data are needed and a flexible policy (management) framework is required. This gives stakeholders confidence that as knowledge improves and learning takes place, the policy (management responses) can be modified in response and the risk of significant environmental harm is reduced.

Another advantage of the adaptive–collaborative approach is that in dealing with conflicts over science, the differences over values and interests that support the differences in science are also addressed and further reduced. As noted earlier, resolving uncertainty in a collaborative way reduces the likelihood that achieving a social agreement will be at the expense of getting a better understanding of the environmental problem in question.

Two cautions about the ability of the adaptive–collaborative approach to deal with conflict and science should be noted. Firstly, all types of information — science, local and indigenous knowledge — need to be given adequate and fair consideration by all participants if the approach is to be successful. Secondly, in dealing with the uncertainty over science, stakeholders may engage in risk aversion activities, thus undermining the adaptive management process and not allowing the policy making to take its course.

A further caution should be noted about the adaptive–collaborative approach, which is its ability to always deal with governance conflicts. It can be argued that an adaptive–collaborative approach is more problematic than the collaborative approach because considerably more resources are required to do adaptive–collaborative policy making — modelling, monitoring, collecting the data and doing the analysis. This can make some agencies reluctant to commit to the approach and instead opt for more traditional, less resource–hungry approaches. Further, agencies may engage in risk aversion, as already discussed, which will cause increased tension throughout the process, as these agencies would be seen to be getting in the way of good policy making and management.

Summary

In short, the adaptive–collaborative approach has the capacity to deal with all of the conflicts that are embedded in modern environmental policy making, but success may still not follow because the approach requires considerable institutional change from

stakeholders (i.e. social learning). In the absence of social learning, the necessary technical learning will also not be possible.

Chapter summary

This chapter began with a discussion of the communicative/deliberative turn in planning as the starting theoretical framework for understanding how policy making can be carried out in highly contested contexts. It was argued that this framework has great value in understanding the processes involved in dealing with conflict, but that there are shortcomings. In particular, where the communicative/deliberative advocates see conflict largely as a single dimensional social problem, conflict in environmental policy making often involves wicked problems where the conflict is deeper, more complex and involving longer timeframes than most planning conflicts. As well, many environmental problems involve many jurisdictions and can be transnational. Consequently, the chapter went on to explore the nature of conflict in environmental policy making and proposed that this conflict can be categorised under three broad themes:

- Social,
- Governance, and
- Science and information.

It was further proposed that social conflict — differences over interest, values and goals for the environment — are not new in environmental policy making, but are now more deeply felt and firmly embedded in the policy making process. Science and information, so long the foundation of environmental policy making, can now be the source of conflict, particularly where the environment being contested is highly complex, information is lacking, uncertainty about outcomes is high, the very objectivity of the experts and their information is challenged and other sources of information (local knowledge) are not given due credibility in the decision making process. Add to this the potential for the breakdown of governance, where competing governments have jurisdiction over the environment in question, existing bureaucratic structures cannot adequately deal with the environmental problems, increased tensions between government agencies and the public (lack of trust), and a political emphasis on short term successes over longer term environmental gains, then the potential for policy failure becomes very high, particularly where this conflict is not seriously addressed.

Finally, it was argued that the existence of these sources of conflict is most likely to lead to conflict where the resource at the centre of the conflict (consumable and useable) is scarce. Three types of scarcity were identified: decreased quantity of a resource, increased demand on a resource, and reduced quality of an existing resource (scarcity of good quality resource). Of course, it should not be assumed that the nature and extent of conflict in

environmental policy making is always so problematic, but it is those cases where conflict is intense that are the focus of this study.

Four broad environmental policy making approaches were identified here. The first was called traditional expert-driven approach, and can be summarised as a highly centralised approach dominated by the expert regulators, and policy mechanisms chosen being predominately science-based, technical and statutory (command and control). The second was the ecological modern approach, which can be summarised as a shift away from an expert agency centred policy making to a process that is more inclusive of industry and the peak environmental groups and favours either market-based or voluntary policy mechanisms (i.e. de-regulation), but still relies heavily on science to support decision making.

The third is the collaborative approach, which can be summarised as focusing on a highly participative form of policy making where delegations of decision making to a collaborative group inclusive of all stakeholders is at least implied if not actual. A whole range of policy mechanisms can be applied depending on what the collaborative decision making group decides. The fourth is the adaptive-collaborative approach, which can be summarised as a collaborative approach using active adaptive management to deal with the uncertainty of the science and information inherent in the policy making context. Adaptive management involves: making early management decisions based on the best available information; the establishment of environmental modelling and an extensive monitoring programme; on-going review of the results of the monitoring; and revising modelling and adjusting management in accordance with this review.

These four policy making approaches have some overlap with the three policy processes identified by Vigar and Healey (2002) (their *technocratic* process is similar to the traditional expert-driven approach and their *collaborative/deliberative/interpretive* process is similar to the collaborative approach), but this thesis provided more detailed insight in environmental policy making and proposes that there are two additional approaches not covered by Vigar and Healey's work.

The Chapter finished with an analysis of how each approach could deal with conflict. It was argued that the traditional expert-driven approach is only able to manage low levels of conflict, and is unlikely to be successful where: there are competing interests and values; the environmental problem is complex involving high levels of uncertainty; subjective judgments are made about the science used in support of the policy making; and/or where conflicting governance issues emerge.

The ecological modern approach is more promising than the traditional expert-driven approach in dealing with conflict. The more inclusive approach of decision making goes some way to addressing the conflicting values embedded in much of environmental policy making, although it was noted that many within the broader community, including the more radicalised elements of the environmental movement, are not directly involved when this

approach is applied. The de-regulatory emphasis of the ecological modern approach, with reduced roles of governments and agencies, should ensure that governance conflicts are better managed than under the traditional expert-driven approach. However, as with the traditional expert-driven approach, science is central to ecological modern policy making, and the concerns raised in relation to the traditional expert-driven approach apply to the ecological modern approach as well.

It was noted that the participative turn in environmental policy making leads to some significant improvements in the level of participation used in both traditional expert-driven and ecological modern approaches, but the inability of these centralised decision making approaches to deal with many of the conflicts that emerge remains.

It was concluded the collaborative approach goes a considerable way to dealing with the deeper and more embedded conflict in environmental policy making. The collaborative approach can address the different values and interests directly, involves some implied, if not actual, delegated decision making, and can lead to governance conflicts being addressed either internally as part of the process or externally. The main concern raised about this approach is in dealing with conflict where the science is highly uncertain and contested. It was noted that a focus on social outcomes (resolving conflicts over values and interests) could come at the expense of addressing the real environmental issues.

Finally, the adaptive-collaborative approach has the capacity to deal with all of the conflicts that are embedded in modern environmental policy making:

- It has all of the advantages of the collaborative approach in dealing with conflicts over values and interests and governance;
- It deals head on with the conflict where the science is uncertain and contested that the other approaches ignore; and
- In dealing with conflicts over science, the differences over values and interests which support the differences in science are further reduced.

There are valid concerns, however, about the ability of the adaptive-collaborative approach to deliver on its promise: considerably more resources are required to engage in adaptive-collaborative policy making; all forms of knowledge need to be given fair treatment; and the key agencies and stakeholders could engage in risk aversion that would undermine the very basis of the adaptive management process. In short, in the absence of social learning, the necessary technical learning would also not be possible and the policy would ultimately fail.

This analysis and the discussion in the Chapter have established the theoretical basis of the thesis and argued a case that in responses to the research question posed here (“what policy making approach is most likely to succeed in highly contested contexts where levels of conflict are significant, both in intensity and complexity?”) the adaptive-collaborative approach is most likely to deal with high levels of conflict. The remaining Chapters will report the research carried out to answer the research question posed of this thesis.

Chapter 3 – Methodology

Overview

To answer the research question posed here it is necessary to compare how real-life examples of the different policy making approaches identified in Chapter 2 perform in highly contested contexts. A review of the methodologies used in comparable studies has been carried out first.

Review of comparable studies

Two conclusions can be drawn from a review of previous comparative policy studies. First, most studies focus on success/failure of actual policies rather than policy making, the focus of this thesis. Consequently, the discussion below will make little reference to policy making evaluation. Second, the policies being compared are either from different governments, of a single government or agency, in a particular environmental sector (for example, waste management), or studying a particular policy making approach (for example the uses of voluntary mechanisms). Comparative studies of different governments have involved several governments (Jahn 1998; Janicke and Weidner 1995; Busch and Jörgens 2005) or as few as two (Burby and May 1998). To strengthen the analysis, these studies often apply quantitative measures or tools to highlight differences between governments. Jahn's (1998) study comparing the environment policy making in 18 OECD countries used published quantitative environmental data (for example pollution levels) to create an index of environmental performance that enabled the policy making regimes in the countries to be compared. Busch and Jörgens' (2005) study used existing databases and published studies to look for trends over time in how 22 specific policy innovations were taken up by selected European countries. The focus here was not on environmental outcomes but on the policy measures (innovations) used, and analysis involved comparing the policies as written and implemented and examined the measures used.

Burby and May's (1998) study compared the environmental hazard mitigation policies of Florida and New South Wales. The study compared a random sample (30) of local governments in Florida with 127 local in New South Wales. The data collected for the comparison were a mix of quantitative (questionnaires) and qualitative (selected interviews). Comparison between the policy making approaches of the two States was descriptive rather than involving quantitative measures.

One study examined the environmental policies of Greece (Lekakis 2000), using data from published documents, existing statistical data including databases, and a questionnaire of

46 key individuals. There was some quantitative comparison of the different policies, but the comparisons were largely descriptive.

There are at least two studies into the US EPA policy making (Landy, Roberts, and Thomas 1990; Firestone 2002). Firestone's study (2002) was a review of the enforcement practices of the US EPA in applying its policies and legislation. A quantitative statistical analysis of 4,600 cases within the EPA's data base allowed patterns of enforcement practices to be identified.

Leach Pelkey *et al* (2002) examined 44 catchment (watershed) partnerships in California and Washington USA, and developed six evaluation criteria so that the success of the partnerships could be determined and comparisons made. The criteria were descriptive — for example, “perceived effects of the partnership on the condition of the watershed” — but, generally, quantitative indexes or scores on these criteria were used. For example, the criterion “Perceived Effect on Human and Social Capital” was measured by surveying catchment users and stakeholders and asking respondents to assess, using a seven-point scale, whether the partnership had been a source of new relationships and/or increased their understanding of some key issues, including: did new long-term friendships or professional relationships develop, did participants develop a better understanding of other stakeholders' views, and did participants develop a better understanding of the bio-physical processes of the catchment. The survey was sent to “all participants sufficiently knowledgeable about the partnership to complete at least part of the questionnaire, plus several knowledgeable non-participant observers” (Leach, Pelkey, and Sabatier 2002). As well as the survey, selected key participants in each catchment were interviewed, relevant documents reviewed and meetings minutes analysed.

There are several studies that examined specific policy instruments or approaches, for example voluntary mechanism (Alberini and Segerson 2002; Cabugueira 2001). Jones and Burgess (2005) examined 15 examples of collaborative management of marine protected areas in the UK. The main sources of data were long interviews with the project officers for each of the case studies and a review of existing documentation. The case studies were then compared by looking for common themes in the data. This analysis allowed certain conclusions to be made, for example that three distinct and different management structures were evident across the 15 case studies.

Other comparative studies have used fewer case studies. In a study of collaborative management in specific geographic area (Wyoming public rangelands) Paulson (1998) examined 4 case studies in-depth involving long interviews (23), attendance of meetings and analysis of meeting minutes. Four other case studies were considered intermediate-depth case studies where the main data sources were shorter interviews. As well, a telephone survey of stakeholders was carried out. Paulson (1998:304) argues that the choices of which case studies to study in-depth was based on purposive sampling “in which the researcher selects cases that are most likely to produce information to help answer the

question". Here, comparisons between the case studies was descriptive based largely on the qualitative data, with the phone survey information used to cross reference the interviews as well as providing limited quantitative data.

Ebbin (2004) examined two case studies where cooperative management was employed in the management of a fisheries. A qualitative approach was adopted that primarily involved semi-structure interviews with selected individuals who were either engaged in fishing or were engaged in the management of the fisheries. As well, key documents were reviewed, and observations made of a variety of meetings held to discuss the management of the fisheries. There are elements of what Kemmis and McTaggart (2000) call participatory action research in this study as Ebbin was directly involved in the cooperative management case studies as a commercial and subsistence fisher, as well as being employed in the processing industry.

Choice of overall approach in this thesis

Summarising the above review, two broad methods can be identified:

- A review of many policies using environmental data or derived indexes so that quantitative comparisons between the policies can be carried out; or
- A case study method usually involving several case studies where a mixture of quantitative and qualitative measures is used to compare policies but the comparisons are predominantly qualitative.

Irrespective of which broad method is applied (quantitative vs. qualitative) one key methodological question needs to be answered: how is policy making success (evaluation) determined?

At first glance, the notion of measuring a successful policy seems straightforward. In its simplest form, a successful policy is one that actually delivers an improved environmental outcome – i.e. a policy is *effective* in achieving its objectives. If policy effectiveness was to be used as the sole measure of success, then studying many policies across a wide range of contexts would be possible (the first broad method) provided the data are either readily available or relatively easy to gather. Effectiveness is rarely, however, used as the only criterion to determine policy success, with many studies using economic efficiency in parallel with effectiveness to determine overall cost-effectiveness (Fron dela and Schmidt 2005; Alberini and Segerson 2002; Operations Evaluation Department of the World Bank 2001). Including economic efficiency to measure policy success would add some complexity to the analysis, but may not necessarily prevent many policies being studied. A more significant issue relates to the validity of relying predominantly on effectiveness as a key measure of policy success.

Relying on effectiveness as a primary measure policy success raises some significant methodological questions, notably:

- If improvement (effectiveness) is observed, what degree of improvement would be considered necessary for success?
- Would improvement have occurred if the policy had not been implemented — i.e. is the policy the cause of the improvement or is it because of some other mechanism?
- What are the unintended consequences of policy effectiveness (both environmental and socio-economic), how significant are these other consequences and do they counteract any environmental gains caused by the policy?
- Could another approach or mechanism have delivered as good an environmental outcome at a lower cost and fewer other impacts?
- Does the implementation of the policy takes resources away from other areas of environmental management causing environmental harm in those areas?

Further, this thesis focuses on *policy making* in highly contested environmental contexts, and a feature of these contexts is that the nature of the environmental resource is complex and it maybe that environmental improvement may not be noticeable in the short term: that is, it would not be possible to determine quantitative effectiveness. As well, given the complexity of the contexts, it is likely that other policies, laws, regulations and management plans are in operation that will have spill-over effects into the specific policy making area. Separating the impacts of each mechanism will be highly problematic.

There is a compelling case, therefore, to broaden the notion of success beyond considerations of measurable environmental improvement and use a range of other criteria (a multi-criteria method), in particular:

- Indirect measures of effectiveness in cases where measurable environmental improvement is difficult to determine and where policy making of draft policies is being considered; and
- Measures that relate to other indirect or direct policy impacts (socio-economic and indirect environmental impacts).

Given the higher level of complexity associated with a multi-criteria evaluation method, the number of policies that could be examined is limited within the context of a Ph. D study and a multiple case study method is favoured. The choice then is one between a more quantitative method using effectiveness and efficiency as the criteria for comparison of many policies and a more qualitative approach where a multi-criteria evaluation is applied to fewer policies. The choice will involve the trade-off referred to by Hammersley (1999) where choices between quantitative and qualitative approaches will

... often depend on the purposes and circumstances of the research, rather than being derived from methodological or philosophical commitments. This is because

there are trade-offs involved. For instance, if we seek greater precision we are likely to sacrifice some breadth of description; and vice versa.

(Hammersley 1999:80)

As well, this study is not just about policy success/failure but is about policy making success/failure.

The choice, then, is as much about the purpose of the study as it is about what methodology to use. The multi case study approach will have the added advantage of, as Eisenhardt (2002:8) notes, of getting greater “understanding (of) the dynamics present within single settings”. So, whilst fewer policy making examples would be examined, the use of the multi-criteria evaluation method will involve collecting data on a range of matters allowing for a more detailed analysis of each policy making. It’s a choice between precision and breadth. The choice made here is to opt for breadth of description over precision, and to apply a multi-criteria evaluation method on a select number of policy making examples (see Chapter 4 for a description of that evaluation method).

This use of case studies in this study is what Sarantakos (2005:221) calls an “instrumental case study” which is “used to inquire into a social issue or to refine a theory”. In this case, this study’s overall proposition and hypothesis are being tested. This study adopts, therefore, a naturalistic approach similar to Patton’s (Patton 2002:39), that “takes place in real-world settings and the researcher does not attempt to manipulate the phenomenon of interest”.

The trustworthiness of case studies

Overview

Case study research is inherently qualitative (although quantitative tools can be used) which is often perceived by those favouring quantitative methods as being unstructured, exploratory and a useful first step in what should be a largely quantitative research exercise, and, as noted by Bryman (1999:37), is seen as a “somewhat second rate activity (where the) qualitative data cannot stand in their own right because they need to be verified”.

Critics of qualitative research raise many concerns including that anything goes, it is unrepresentative, and raises significant ethical questions (Sarantakos 2005:46), but mainly its trustworthiness is questioned, which Seale (1999) suggests is about validity and reliability. Validity is both internal (has the truth been uncovered) and external (transferability to other contexts), whereas reliability is about consistency of findings (would the findings be the same if the study is repeated) and the neutrality of the research design and the researchers. The notion of truth here is not the positivist view of one single truth,

but, as Seale (1999:52) argues, is one of the “relationship between claims and evidence” that “at no point claims ultimate truth, but regards claims as always subject to possible revision by new evidence”. These four elements of trustworthiness are addressed in turn below.

Internal validity

One technique often used to enhance validity is that of Denzin’s (1978) triangulation which, as Silverman (2006:290) argues, is “comparing different kinds of data (e.g. quantitative and qualitative) and different methods (e.g. observations and interviews) to see whether they corroborate one another”. Triangulation has its critics largely because, as some argue, it assumes a positivist position that some inherent truth exists. Denzin (Denzin and Lincoln 2000:5) himself has modified the notion of triangulation in recent times to be no longer “a tool or strategy for validation but an alternative to validation” that uses multiple sources of data to add “rigor, breadth, complexity, richness and depth to any inquiry”. The truth, then, is not what is common to different sources of data but the sum of it.

Janesick (2000:381) argues that triangulation’s secondary and supporting sources of information are used to “capture the nuance and complexity of the social situation under study”. Patton (2002:447) argues that case studies should be both holistic and context sensitive. By holistic Patton argues that the social phenomenon being studied is both complex and greater than the sum of its parts, and to properly understand that complexity data needs to be collected from a range of sources. Again, the use of a variety of data sources is not about confirming the conclusions drawn from one source but is about arriving at a full understanding of the subject matter being studied.

In summary, internal validation is ensured where a range of data sources are used so that the true breadth of the truth is uncovered. The various data sources used in this study are described next.

Sources of data — ensuring validity

As noted above, many comparative studies used quantitative indexes to compare policies, using published environmental data (to measure effectiveness) and surveys/questionnaires to develop indexes of environmental performance. For some of the examples of policy making studied here, published environmental data are available and were used where appropriate, notably where measured environmental improvement is to be used as a measure of policy making success.

The possibility of using surveys was considered (to provide data for some indexes of policy making success), but in each policy example the number of individuals and stakeholders that could be surveyed was relatively small making it difficult to get a sample size large

enough to allow statistically valid conclusions to be drawn or indexes to be constructed. Consequently, qualitative sources of data and measures of policy making success were used in support of the evaluations. Interviews with the key policy makers and stakeholders were a primary source of data for both stages this study. The selection of interview subjects was what Bryman (2004) calls *purposive*, in that they were chosen because of their relevance to the research topic rather than chosen at random. All individuals relevant to the overall topic and the individual case study were approached for an interview, although not all agreed to be interviewed, largely because they were of the view that they had not been involved in the subject or policy long enough to make any informed comment.

The definition of a stakeholder requires some clarification at this point. Leach, Pelkey, and Sabatier (2002:646), in a discussion of collaborative policy making, refer to “stakeholder partnerships”, which consist of “representatives from private interest groups, local public agencies, and state or federal agencies, who convene as a group, periodically and indefinitely, to discuss or negotiate public policy within a broadly defined issue area”. The view that stakeholders include interests groups and agencies is generally accepted in the literature, but there is less agreement about whether to include the public as stakeholders. The exclusion of the public and identifying only groups and agencies as stakeholders is a typically corporatist view of participation. In many other cases, however, the public are included as stakeholders where a direct interest can be identified. For example, in a study of public participation in water resource management, Jonsson (2005:496) identifies four groups of stakeholders, which are polluters (major industries and land owners groups), experts (including organisations with specific expertise), government agencies (especially the regulators) and users (the public who either consume the water or use the resource for specific purposes, notably recreation). Here the public stakeholders are those who have a direct interest in the resource as consumers.

Other authors see the idea of public stakeholders being those only with a direct interest in the resource as too narrow and see stakeholders more broadly as citizens. This debate about role of the public as stakeholders is what Crane, Matten, and Moon (2004:110) see as “either that stakeholders are citizens, or that they represent citizens’ interests”.

For the purposes of this thesis, a pragmatic approach will be adopted in identifying stakeholders based on Jonsson (2005) definition: that is, stakeholders are the key interest groups, relevant agencies and members of the public who have a direct interest in the policy. For convenience, stakeholders will be those who have been involved in the relevant policy making or who have made a submission.

Interviews were semi structured and long, typically lasting between 1 and 2 hours. A series of questions were used as starting points for discussion around the key topics of the subject of the interview. Impromptu follow up questions were asked to clarify answers and to explore other issues raised by the interviewee that were relevant to the study. This semi structured approach allowed for some capturing of specific data that was easily codable

along pre-determined categories as well as analysis that according to Fontana and Frey (2000:653) “attempts to understand the complex behaviour of members of society without imposing a *priori* categorization that may limit the field of inquiry”. Transcripts of the interviews were prepared and sent to the interviewees for checking. Once any changes were made, the texts were coded, responses categorised and themes identified.

Other sources of information were notes from meetings attended, formal meeting minutes, file searches, and published reports. As well, topic-specific opportunistic phone and short interviews were used with key individuals to check certain factual information. In some cases, these interviews provided additional qualitative information that complemented information obtained from the longer interviews.

Two of Sarantakos' (2005) methods of document analysis were used here: descriptive and exploratory. First, documents were analysed for quantitative environmental data relevant to policy effectiveness. Second, documents were searched for what Sarantakos (2005:294) calls “peculiarities, characteristic attributes and trends in the text that mark the identity of the message conveyed through the document”. In this way the understanding of the policy making contexts were enhanced.

External validity

External validity relates to the transferability of the case studies to other contexts. This is also referred to as generalising, and the chances of this happening are enhanced where, as argued by Seale (1999):

Thick, detailed case study description can give readers a vicarious experience of 'being there' with the researcher, so that they can use their human judgement to assess the likelihood of the same processes applying to their settings which they know.

(Seale 1999:118)

The more detail provided in the case studies, the more likely that the reader will recognise its applicability to the reader's own experiences.

Generalising from case studies is particularly valid for studies of environmental policy where there is growing evidence that globalization has caused policy and legislative convergence: i.e. Western governments are prone to copy the success stories of other Western governments (Busch and Jörgens 2005), a process also known as diffusion (Tews 2005). A study of policies confined to either a single geographic area or environmental theme could have something significant to say about environmental policy making in other areas, other jurisdictions, both nationally and internationally.

Transferability is enhanced where the case studies are what Schofield (2002:181) calls “studying the typical,” and the case studies described below, it will argued, are typical.

Reliability — consistency of findings

Reliability in this context relates to the level of confidence in the data. Some of the data sources used here have greater inherent reliability in that they are in written form (reports, meeting minutes and file documents), which are usually checked and verified before publishing. The less reliable data are the interviews. To increase the level of confidence in the information in the interviews, interviewees were sent draft transcripts and provided with the opportunity to check them for accuracy.

From time to time where a policy narrative was developed based on the data that was potentially contentious, the narrative was tested with some key stakeholders either through a follow-up short interview or phone conversation: what Seale (1999:61) called “member validation”.

Reliability — neutrality of the researcher and ethics

Overview

Ensuring my personal neutrality needed careful attention for three reasons. First, I was personally familiar with many of the key policy makers and stakeholders interviewed as part of this study. Second, in my professional work prior to commencing this thesis I had worked with the implementation of some of the policies studied here, although my involvement in their development was negligible. Finally, during some of time I was carrying out the analysis of the data and writing up this thesis, I was employed in a position where a potential conflict of interest could have arisen.

Personal familiarity

Patton (2002:50) uses the term “empathic neutrality” to describe the ideal “cognitive and emotional stance” that a researcher needs to adopt so as to not become too involved with the subjects and, therefore, lose the ability to judge clearly the information, and not to become too distant so that understanding is impaired. My personal familiarity with the key individuals had the potential to undermine my empathic neutrality, but also had a number of advantages. Fontana and Frey (2000) identified seven key attributes of interviewing four of which are useful discussion points here. They firstly refer to accessing the setting, which is about gaining access. I had relatively unimpeded access to the highest level of policy makers including chairman of the EPA and the WAPC, as well as the most senior policy making public servants. In this way, the reliability of the data was enhanced.

Fontana and Frey’s (2000) second attribute was *understanding the language and culture of the respondents*. This had already been established in most cases because I had a working relationship with many of those interviewed. This language and culture was readily transferred to the interviewees I did not know. There was a potential problem here in that I

may well have been seen by some interviewees as part of the culture rather than just being familiar with it, undermining empathic neutrality. This had the potential to create some barriers to open and honest interviewing, namely undermining trust and creating undesired informants (see below).

Locating an informant is another attribute. As Burgess (1999) notes, informants are useful because they act as guides to the field of study, they can become informal research assistants helping locate research material and subjects, they can help interpret information and provide useful historical contexts. Burgess also notes that informants can present some problems: they can try to manipulate the researchers to a particular view or source of information, they require protection as their role may not be seen favourably by other participants, and there is a danger that researchers will exploit informants. I had several formal informants who were middle to low level public servants and I was careful in managing how I used them so as to avoid potential problems. However, a couple of interviewees because of my personal familiarity with them initially wanted to adopt a researcher-informant relationship with me. This was potentially problematic as I was keen to interview each of them and have their views recorded and taken into account as part of my considerations. This problem was averted after some careful negotiations and realigning the relationship.

Another of Fontana and Frey's (2000) attributes is *Gaining trust*. For most interviewees gaining their trust was easy as this had already been established through my working relationship with them. For some, however, there was some initial suspicion as my professional background was interpreted by some in the conservation movement as me being aligned to government and I did not come to the research as a neutral observer. In these cases I either met with the interviewee separately before the formal interview or I spent the first part the interview informally discussing the study and general environmental matters as a way of building trust. Two particular topics of discussion in these separate sessions were research ethics and how the study was designed and being carried out to ensure neutrality.

Professional involvement with policies studied

Having worked with the implementation of some of the policies studied here raised the potential for bias, in that I could have already formed a view about certain policies and policy making approaches. Sadler (2002) identified three types of biases: ethical compromises, value inertia, and cognitive limitations.

Ethical compromises relate to possible inherent subjectivity where there is a conflict of interest between researcher and the agency the subject of the study, a personal relationship between the provider of information and the researcher, and "sloppiness" where, for example, an argument is made that is not substantiated by the data but based on personal views. There was some potential for bias in relation to the EPA, as I had worked

for the EPA previously, but this was dealt with because there is over two years between when I worked for the EPA and the commencement of this study. The potential for bias because of personal relationship with interviewees relates directly to the discussion above about informants and trust, and in addressing these issues I was able to ensure the appropriate distancing between myself and the subjects. Sloppiness was avoided through checking and cross checking themes and conclusions drawn with the information, and through consciously parking any views that I may have throughout the study.

Value inertia relates to what Sadler (2002:125) calls a researcher's "background knowledge, prior experience, emotional makeup or world view". In many ways, this is unavoidable because, arguably, the choice of what to study in the first place is inseparable from all of this. The key here is one of avoiding inertia, or ensuring that personal social learning occurs: what Keen *et al* (2005:9) describe as "a process of iterative reflection that occurs when we share our experiences, ideas and environments with others".

In a research context, social learning that avoids value inertia is largely a one-way process where the information is reflected upon and the researcher observes and takes the experiences and ideas of others but at some distance. The researcher in a naturalistic study does not share his/her experiences or ideas. A critical test that I applied to check that inertia had not set in was to keep looking for surprises in the information that would then trigger further iterative reflection.

Finally, cognitive limitations relate to biases that emerge because of limitations of dealing with information which are due to what Sadler (2002) calls our

... inherent incapacity to deal effectively with large masses of information at once, our intuitive ignorance of notions of natural variability (randomness and probability), and our tendency to seek meaning in or impose meaning upon the world around us.

(Sadler 2002:127)

Sadler (2002) identifies thirteen specific elements to cognitive limitations, including: data overload, positive and negative instances, internal consistency, missing information, sampling considerations and confidence in judgements. There is a clear link here to the issues of validity and reliability already discussed above, and for that reason, this matter is not discussed further here.

Employment and a potential conflict of interest

Finally, during part of the writing up phase, I was employed by the State Government as the Independent Appeals Convenor. The key role of the position was to provide independent advice to the Minister for the Environment on appeals received in relations to decisions and other matters made under the *Environmental Protection Act 1986*. Critical for this study are the following appeal rights:

- Against the decision of the EPA to not assess a proposal;

- Where the EPA is to assess a proposal, appeals against the level of assessment set by the EPA; and
- Appeals against the contents of the EPA assessment report (the environmental assessment).

There was a clear potential for conflict here if an appeal raised matters relevant to EPA policies which were the subject of this study. When the first instance of this occurred, I took leave from my Ph D to avoid any perception of conflict of interests. My leave ended and my studies recommenced when I resigned from the Appeals Convenor position. In this way any conflict between my professional dealings with any EPA policy and my research of that policy was avoided.

Choice of policy making case studies

Multi case studies

Environmental policy is both broad in subject matter and multi-layered with policies applied at many levels (international, national, regional, sector specific, whole of government, portfolio specific etc.). Two options exist for narrowing the choices of the case studies for the first part of this work: narrow the subject matter or narrow the policy level. The latter option of narrowing the policy level was chosen here so that a range of policy subjects can be examined. The policy level that will be focused on will be environmental agency issue specific written policies that are best described as government agency policies, rather than government initiated (whole of government) policies.

It was decided to narrow the geographic extent of the study and focus on two government agencies — the WA Environmental Protection Authority (EPA) and the Western Australian Planning Commission (WAPC). WA was chosen because both these agencies have a long history of environmental policy making covering a range of subject areas. The EPA is also typical of many of the peak environmental agencies throughout the developed world being responsible for the full spectrum of environment issues (although it is noted that EPA's in some States of Australia just focus on pollution type issues). Such an approach makes drawing broader implications and generalisations from this study more valid.

A further consideration is that policy making over the past 20 years has included contexts where the level of conflict has varied from low to intense and has seen the application of all four policy making approaches. It is possible, therefore to find several examples of each policy making approach being used in situations where the level of conflict varies. Analysis of these cases studies is described in Chapter 5.

A major single case study

As well as the multi case study analysis, it was also decided to examine a single case study in more detail: a contemporary case study where the level of conflict was intense. This case study was ideal in that not only was the level of conflict intense, two separate policies were being developed adopting two different policy making approaches: one was a traditional expert-driven approach and the other was adaptive-collaborative. A specific comparison of the success/failure of the two approaches was, therefore, possible. This case study was Cockburn Sound.

There are many examples where a single case study of environmental policy (including management plans) has been carried out: for example, a marine sanctuary in New Zealand (Hughey 2000); a single catchment area in the USA (Habron 2003); a forest area in Mexico (Klooster 2002); and a fishery in Finland (Marttunen and Vehanen 2004).

Specific details of methodology

Policy making evaluation — Chapter 4

Chapter 4 sets the broad context for the substantive part of this thesis by identifying a method to determine *policy making* success, particularly in highly contested environmental policy making contexts, with a special emphasis on WA. The overall aim was to arrive at a set of criteria that could be applied in this study.

First, the international literature on policy evaluation was reviewed and a summary sheet prepared listing the criteria applied and how popular each criterion was in the literature (see Tables 3 and 4 in Chapter 4). Next, the published reports related to policies of both the EPA and WAPC were examined, and the criteria used in any policy evaluation listed and summarised (see Tables 5 and 6 in Chapter 4). This was supplemented with short, focused interviews with the officers responsible for the policies, and searches of the relevant agency files to identify any additional information that supported the agency evaluations. In addition, the individuals who had primary responsibility for policy making from both agencies were interviewed to get an understanding of the overall approaches to policy evaluation. Long semi-structured interviews were used.

The next part was to seek the views of the WA environmental policy makers and key relevant stakeholders about how they believe policy evaluation should be done. This information was collected through long semi-structured one-to-one interviews. The experts chosen for this part of the study were senior environmental policy makers in the EPA, senior planners in the WAPC, and key relevant stakeholders (experienced consultants, academics and senior representatives for the WA environmental movement). To ensure their

involvement in the study most participants wanted their anonymity protected not only from other participants but also as part of this published study. Consequently, any direct quotes used here are not attributed to any person. Interviews were long and semi-structured, with fixed questions, many open-ended, and follow-up questions were asked in cases where responses were not clear. The use of experts in this way is considered valid because, as noted by Vázquez-Ramos *et al* (2007:112), it can be used to “elicit perceptions or judgements held by experts who are knowledgeable in a specialised area”.

The general approach to the interviews and to arriving at the final list of criteria was as follows:

- Interviewees were asked to list the criteria they believed should be used to evaluate policy making, and to explain why they had chosen these criteria;
- They were then shown the summary sheet referred to above and asked if they wanted to revise their list of criteria – some, but not all chose to make some modification;
- The draft set of criteria was drawn up by the author based on the summary sheet, the criteria actually used in any WA policy evaluation, and the responses in the interviews;
- These draft criteria and the transcript of the interview was sent to each interviewee, and they were offered an opportunity to make any modifications to either. Each interviewee was contacted directly as a follow up to ensure they had received the information as to ask if they would like to comment on the draft set of criteria and suggest any modifications. Only one person chose to make a change and this was to parts of his interview transcript and not the criteria.

This last step was critical to ensure the validity of the criteria. It was concluded, therefore, that there was consensus on the draft set of criteria, and these became the final criteria.

It is important to note that this thesis is interested in the broader topic of *policy making* rather than the actual policy. As will be seen in chapter 4, the policy evaluation literature has a strong focus on what can be called policy performance (for example effectiveness and efficiency) but also covers evaluation of the policy formulation process as well as policy content. The link between evaluation of policy and evaluation of policy making will be discussed and a methodology for evaluating policy making will be proposed. This emphasis on policy making will allow draft EPPs to be evaluated that would not be the case if the emphasis was on actual policy.

Evaluating WA environmental policy making —

Chapter 5

Chapter 5 is a detailed evaluation of the EPA's policy making using the criteria developed in chapter 4. The data used were published information relevant to each policy, departmental file searches, short interviews with the relevant departmental officers responsible for each policy, and long interviews with key policy makers and relevant stakeholders. The purpose of the short interviews was to seek background information on individual policies not contained in files.

The long interviews were with the high level policy makers in the relevant agencies as well as the key policy stakeholders from other agencies, policy experts and representatives from the main NGOs, and covered three broad areas:

- Which environmental policies did interviewees believe have clearly succeeded or failed;
- Why did the interviewees believe that the policy succeeded or failed; and
- What were the key factors for successful policy making?

The interviews also provided a source of material that enriched the discussion on individual policies.

The potential for conflict to be a reason or cause of policy success or failure was not raised specifically with interviewees so as to avoid the possibility of leading responses in a particular way. Further, the overall proposition and specific hypothesis of this thesis was not revealed to interviewees. Consequently, it can be concluded that if conflict was raised by an interviewee, it is a significant factor for policy success or failure in the mind of that interviewee.

In general, the questions were open in that interviewees were not asked to comment on specific policies provided as a list. Given the open nature of the questions, it can be concluded that when an interviewee identified a policy as either succeeding or failing, in their mind, success or failure was clear. Further, if an interviewee did not identify a policy, it can be concluded that either, in their mind, it did not either clearly succeed or fail, or they had no clear view one way or the other.

Summary

This study involves a two staged approach, with the first stage being a multi case study comparison of the four policy making approaches, and the second stage being a close examination of a particular policy making example where conflict is known to be particularly

intense. The high level policies of both the EPA and WAPC make up the multi case studies stage of this study and policy making in Cockburn Sound is the stage two case study.

The limited multi case study method was chosen over a quantitative study of many policies for two reasons. Firstly, applying a multi-criteria evaluation method limits the number of policies that can be studied within the context of a Ph. D, and secondly I have a preference for breadth of coverage over precision of a limited number of factors.

The multi-criteria evaluation method uses environmental performance information to determine actual effectiveness where available and qualitative sources of data for the other criteria including surrogate measures of effectiveness.

The validity and reliability of this study was demonstrated through careful design, in particular addressing possible concerns about my neutrality.

The specific design elements of policy evaluation and the multi case study elements of this study were described.

Chapter 4 – policy making evaluation

Overview

The aim of this chapter is to identify a method to determine policy making success that is particularly applicable where the level of conflict is significant, and has relevance to the WA context. As noted in Chapter 3, the international policy evaluation literature will be reviewed first and the findings of that review moderated to fit the WA environmental context using the method described in Chapter 3.

It is important to note that the policy evaluation literature relates to policies that are operational (that is, have been finalised and are being implemented). There is a strong emphasis on criteria that measure policy performance which covers both effectiveness and efficiency measures. As already noted, this thesis covers the broader topic of *policy making* rather than just policies. Consequently, this allows certain draft policies (i.e. those not finalised) to be included: notably, those draft policies that attain some status and have some impact on agency decision making. Determining policy performance of these draft policies presents some interesting, but not insurmountable, challenges, as will be discussed.

Review of evaluation literature

Introduction

Policy evaluation is done, for the most part, to determine whether the policy goals and objectives are being met. In practice, it has a range of other benefits including facilitating increased learning at an individual and agency level, and facilitating organisational change (Poulin, Harris, and Jones 2000). This section examines how policy success and failure has been determined in a range of international studies. Whilst the focus is on environmental policy evaluation, studies that evaluate other related subjects are included — for example, methods used by some funding agencies to evaluate potential projects on possible environmental impacts.

One study has reviewed the general (i.e. not just environmental) policy evaluation literature (Thissen and Twaalfhoven 2001). The authors reviewed 33 different texts and journal articles and concluded that there are six broad categories of policy evaluation criteria depending on the stage of the policy process considered:

- Input — related to aspects prior to the policy being initiated (e.g. reason for policy and availability of data);
- Content — e.g. appropriateness of the policy subject, validity of methods used;

- Process — i.e. the policy formulation process;
- Results — or specific policy measures;
- Use — who uses the various policy measures and for what purpose; and
- Effects — flow-on effect of the policy in other areas and other policies.

Policy evaluation, therefore, is broader than evaluating just policy content. This is consistent with the requirements of this thesis, which is to determine the success of policy making, a broader consideration than policy content evaluation. Building on this work, a modified categorisation is used in this study to review the literature using the following three aspects of environment policy process:

- The policy formulation process;
- Policy content; and
- Policy performance, both direct (performance related to objectives), and ancillary impacts (other environmental impacts and broader socio-economic impacts).

General approaches to evaluation

In reviewing the literature three general approaches to environmental policy evaluation were identified. The first is a general systematic approach to evaluation without setting out specific evaluation criteria. For example a study by Bellamy, Walker et al (2001:409) examined the requirements for natural resource management evaluation. They used their extensive experience in natural resource management to “provide a basis for presenting an integrative systems-based framework to guide and structure the evaluation of natural resource management policy initiatives.

No specific generic evaluation criteria were proposed, as they noted that “(e)valuation of impact against a single criterion or overly limited set of criteria may miss important benefits and lead to significant cost remaining unrecognized” (Bellamy et al. 2001:409). Instead they described a framework that enabled evaluation criteria to be identified on a case-by-case basis.

A second approach involves quantifying effectiveness, which is done through a detailed set of criteria, actions and indicators that measure success. For example, the Organisation for Economic Co-operation and Development (OECD) evaluated the environmental performance of member nations. The review focused on the effectiveness of environmental policies in the areas of pollution control and nature conservation. The evaluation is based on “the degree of achievement of domestic objectives and international commitments” (OECD Working Party on Environmental Performance 2000:3). The OECD has developed a detailed list of criteria to evaluate member states. For example, two of the criteria applied to determine progress made in addressing climate change are:

- Fully implement national commitments, such as emission limitation and reduction targets, including those established under the United Nations Framework Convention on Climate Change (UNFCCC); and
- Expand research and assessments on the rate, timing and impacts of climate change on technologies to respond to it and continue to support the work of the Intergovernmental Panel on Climate Change (IPCC).

The third approach involves specifying a set of criteria that are to be used to compare various policy initiatives. These criteria can be both qualitative (degree of political support) and quantitative (for example, measures of effectiveness). For example, a study by Janicke and Weidner (1995) examined 24 cases of environmental policy world-wide using the following criteria:

- Lasting effect — are the environmental gains short, medium or long term?
- Bonus effects — are the environmental gains a direct result of the policy or as result of other initiatives?
- Problem shifting — are the environmental gains achieved by shifting problems to other sectors?
- Innovation — are the policy measures about resource saving or end of pipe solutions?
- Efficiency — are the environment gains accompanied by economic benefits as well?

The broad evaluation approach used in this study

The first approach – the systematic approach to evaluation – is not used in this study because whilst it is useful in examining and evaluating individual policies in isolation, it is inherently subjective and case-specific, making it difficult to use when comparing a number of policies. If it were to be used to evaluate a number of policies, the conclusions about success and failure of each policy may be reasonable, but analysis of the differences between the policies is more difficult because the methodology used for evaluation would likely vary from policy to policy. Comparison would only be possible if a consistent approach was applied, which would require the development of a uniform set of evaluation criteria, which is the basis of the other two broad approaches.

As noted in Chapter 4, relying on measures of effectiveness to measure policy success has problems and will not be used here. It should also be noted that the social aspects of the policy making cannot be ignored where conflict is deeply embedded as part of the policy making. It is reasonable, therefore, to also include measures of success on some social criteria, for example, reduced conflict.

For these reasons, therefore, the broad evaluation approach involving a set of criteria will be used in this study. The following section reviews the relevant literature.

Qualitative criteria case studies review

Overview

A total of fifteen case studies using multiple criteria approach were identified, with six being from specific agencies, government and non government,² and nine published in the academic literature³. The remainder of this section deals with these fifteen studies.

Appendix 1 provides the detailed analysis of these studies with only the summary provided here. Eleven generic evaluation criteria were derived after analysis of all of these studies, as follows:

- Performance effectiveness — how well the implementation of the policy delivers on environmental objectives;
- Performance efficiency — related to the cost effectiveness of the policy;
- Content relevance — whether the policy actually addresses the environmental issues at stake;
- Other socio-economic impacts — whether the policy has desirable or undesirable effects other than environmental (i.e. social and/or economic);
- Social equity — related to how the costs and benefits of the policy are distributed throughout the community;
- Legal effectiveness/enforceability — related to the legality and practicality of the actions proposed;
- Measurability — whether the policy contains mechanisms that allow for impacts to be measured;
- Flexibility — whether the policy mechanisms can adapt to changing circumstances;
- Innovation — whether the policy encourages new and innovative solutions to the environmental problems; and
- Political support — whether the policy gains support from the community, key stakeholders and the political process;
- Other — miscellaneous criteria used not applied in more than one study.

² (McNeely et al. 1990; USEPA 1998; Evaluation Unit of the Joint External Relations Service of the European Commission 1999; Monitoring and Evaluation Division of the IUCN 2001; Operations Evaluation Department of the World Bank 2001, 2002; European Environmental Agency 1999)

³ (Barron and Ng 1996; Economou 1992; Janicke and Weidner 1995; Barde and Smith 1997; Hughey 2000; Cabugueira 2001; Fullerton 2001; Alberini and Segerson 2002; Enzensberger, Wietschel, and Rentz 2002)

Discussion

Tables 3 and 4, and Figures 2 and 3 below summarise the results in Appendix 1. Table 3 and Figure 2 show the total number of times each of the evaluation criteria have been used in the studies. They show the number of times each is used in the two types of studies (i.e. agency and academic) and the total number of times used. Table 4 and Figure 3 shows the number of evaluation criteria applied to each of the three aspects of policy making identified earlier.

Table 3: Summary of criteria used to evaluate environmental policy

Generic criterion	No. of times used in agency studies	No. of agency studies that used criterion (6)	No. of times used in academic studies	No. of academic studies that used criterion (9)	Total No. of times used	Total No. of studies that used criterion (15)
Performance effectiveness	5	5	12	8	17	13
Performance efficiency	8	5	9	7	17	12
Content relevance	7	5	2	1	7	6
Other socio–economic impacts	6	5	8	6	14	11
Social equity	1	1	4	4	5	5
Legal effectiveness/ enforceability	2	1	2	2	4	3
Measurability	2	2	2	2	4	4
Flexibility	1	1	4	3	5	4
Innovation	0	0	3	3	3	3
Political support	7	5	2	2	9	7
Other	1	1	2	1	3	2

At first reading it might seem that columns 2 & 3, 4 & 5 and 6 & 7 in Table 3 show the same information. Columns 2, 4 and 6 show the number of times that a criterion type has been used in total. Some studies have more than one criterion that can be classified under the same generic criteria used here (for example four of the six criteria used in Hughey’s (2000) study are classified as “performance effectiveness”). Columns 3, 5 and 7 show the number of studies that used that type of generic criterion irrespective of how many of these criteria each study has. These columns are considered to be a more accurate measure of the usefulness and popularity of each generic criteria type and are shown in Figure 2. The columns in Table 4 show similar data. Figure 3 showing the number of studies that have applied a criterion related to each of the three aspects of policy making.

Table 4: Summary of criteria used to evaluate environmental policy in terms of the stage of the policy making process applied

Policy making process criteria applied to	No. of agency policy evaluation studies using criterion	No. Agency studies using criteria at policy making stage (6)	No. of academic policy evaluation studies using criterion	No. academic studies using criteria at policy making stage (9)	Total	Total No. of studies using criteria at policy making stage (15)
Policy making process	1	1	1	1	2	2
Policy content	12	6	15	6	27	12
Policy performance						
– direct	20	6	20	9	40	15
– ancillary	7	5	14	6	21	11
– Total policy performance	27	6	34	9	61	15

A number of observations can be made about the above information. First, all of the studies use criteria other than effectiveness to determine policy success or failure, with (surprisingly) two studies not using effectiveness at all. The clear implication is that policy evaluation is considered to be more than just about effectiveness, a point already made here.

Second, there are three criteria that are used by most of the studies: performance effectiveness (13/15); performance efficiency (12/15); and other socio-economic impacts (11/15). Clearly, effectiveness is a key evaluation criterion and it would be a mistake not to include measures of effectiveness in any evaluation. The common use of efficiency criteria is significant. Agencies and governments are concerned about the best use of limited resources, and consideration needs to be given to the cost implications of policy implementation. Questions such as “can other policy measures that are less expensive to apply give equivalent environmental outcomes?” and “could the same resources be used more effectively solving another environmental problem?” and “will the cost of implementing a policy require some trade-offs in relation to environment outcomes?” are important in this context.

Figure 2: Frequency of evaluation criteria applied across the fifteen studies

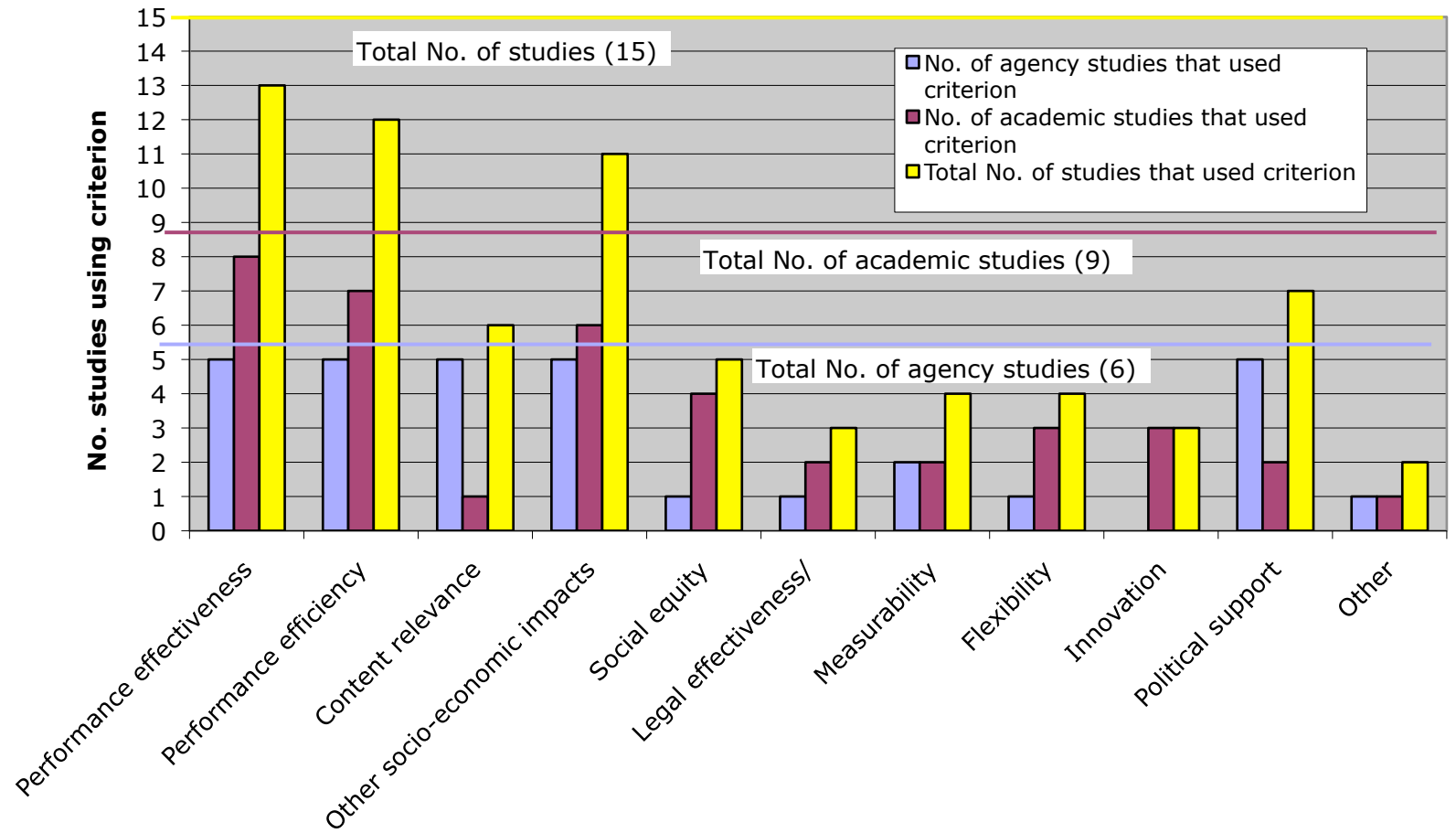
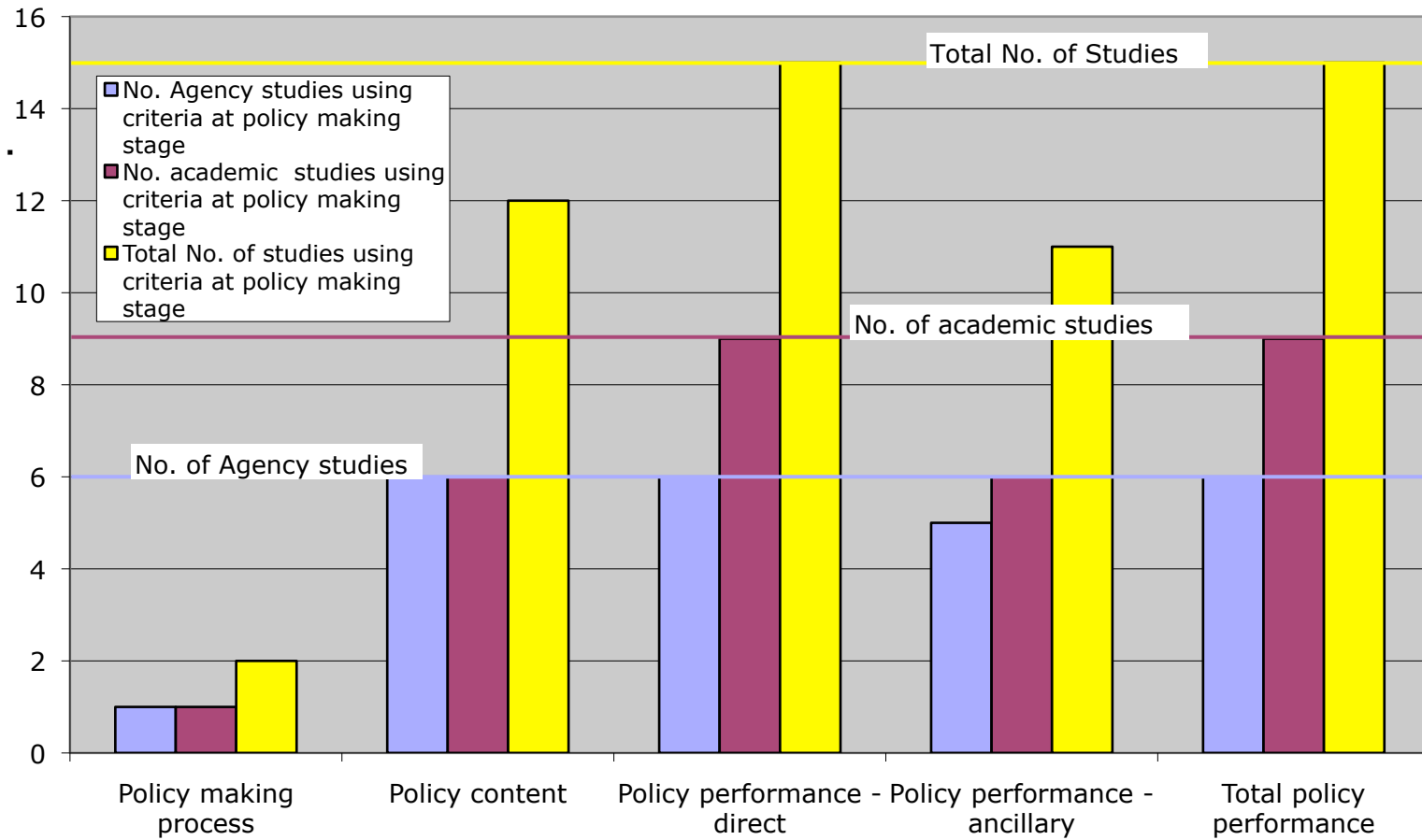


Figure 3: Numbers of evaluation criteria used at each of the three policy making phases for the fifteen studies



These questions are particularly important in biodiversity conservation. Efforts to conserve biodiversity often require the purchase and then reservation of areas of bushland in private ownership. Bushland in urban areas will be more expensive to purchase than in remote rural areas, which means that more bushland can be purchased in the rural areas for the same amount of money than in urban areas. However, the bushland available in urban areas may have greater biodiversity value than rural bushland. On the other hand, ongoing management of urban bushland can be more problematic than rural bushland given the proximity to residents and the impacts of excessive human use (trampling, increased fire, weed invasion etc.). Decisions on how to spend resources (policy implementation) may deliver different environmental outcomes both in the short and long-term.

The use of other socio-economic factors in environmental policy evaluation may well reflect the growing influence of the sustainability debate, where the three pillars of environmental protection, social responsibility and economic growth are considered together (Mazza and Rydin 1997). Economic considerations typically dominate decision making across a range of portfolios with many environmental policies adopting either a traditional expert-driven approach or a range of economic instruments to induce environmental change. As Rammel and van den Bergh (2003:121) note: "traditional economic theory of environmental policy can stimulate unsustainable socio-economic structures and patterns". It is not surprising then that policy makers are becoming concerned about the impacts of environmental policies other than just environmental impacts.

Third, political support is a commonly used criterion, more so in agency studies (5/6) than academic studies (2/9). This emphasis in agency studies rather than academic ones likely reflects the political sensitivity of agencies and the general apolitical approaches used in academic studies. Agencies usually operate in a much more political environment than academic researchers and are usually acutely aware of the need to gain stakeholders, community and political support for the policies. Political, particularly stakeholder, support is often used as a criterion where environmental improvement is not observable or expected in the short to medium term and some measure of success is required.

Fourth, agencies are much more interested in the content relevance of policies (5/6) than academic studies (1/9). This is surprising, given that both researchers and agencies should be interested in whether or not the policy actually addresses the subject it was designed to cover. Evaluation of content is usually easier to do than evaluation of effectiveness, particularly where environmental improvement is not observable or expected in the short to medium term. Evaluation of content is also about ensuring the policy is relevant given that social conditions and the community's understanding of the environmental conditions may change over time.

Fifth, policy evaluation focuses mostly on the performance (implementation) and policy content aspects of policy making, with very few criteria used to evaluate the policy making process: all studies used performance criteria (15/15); 12 used criteria to evaluate content;

and only 2 used criteria to evaluate policy making. Not surprisingly, all studies had criteria that evaluate the direct (environmental) impacts of policies, with 11 also assessing ancillary (other environmental and socio-economic) impacts.

Finally, there is no overall consensus about which criteria to use to evaluate environmental policies and which stage or stages of policy making should be evaluated. In many cases the criteria applied will depend on which agency is carrying out the evaluation and the purposes for the evaluation. For example, funding agencies are more likely to be concerned about efficiency measures (i.e. have the funds been spent wisely?) whereas conservation groups might be more concerned about effectiveness (i.e. has the policy delivered on its environmental objectives?).

As Thissen and Twaalfhoven (2001) note “differences in the criteria proposed can, to a large extent, be attributed to differences in perspectives on what is considered good policy” (P. 638). Put another way, the selection of which evaluation criteria to use in different cases is dependent upon how the agency or researcher views success and failure, which involves subjective, not objective, decision making.

This clearly suggests that policy evaluation needs to be seen within a broader socio-economic context. As Thissen and Twaalfhoven (2001) note, policy evaluation shows “the dependency of value judgments and associated criteria on context, time and actor-perspective” (P641). This lack of agreement in the literature about which evaluation criteria to apply is unlikely to be a uniquely international phenomena, and it will be interesting to see if environmental policy evaluation methods used in WA show the same diversity of methodology.

Conclusions from the international literature

The review of the literature revealed that there is no consensus about which criteria to apply to evaluate environmental policy, suggesting that evaluation is done on a case-by-case basis taking into account the local socio-economic context. It is possible, however, to identify some criteria that are commonly used, suggesting they have some level of acceptance:

- Performance effectiveness,
- Performance efficiency,
- Other socio-economic impacts, and
- Political support.

As well, most attention is given to evaluating policy content and performance with little effort made to evaluate policy process.

The first criterion above addresses the fundamental concern for policy making which is that the policy should actually lead to environmental improvement or better environmental

protection. The second criterion acknowledges that resources in environmental protection are always limited and that policy should also be about the best use of limited resources. The final two criteria are particularly useful in highly contested environmental policy making contexts as they allow for analysis of these non–environmental issues that emerge as part of the policy making (other socio–economic impacts) and acknowledge that conflict management is likely to express itself through both stakeholder and high level political support for the policy.

It is reasonable to ask at this point “How will each criterion be assessed?” This matter will be addressed at length at the end of this chapter, but the short answer is that it will be done in a qualitative manner by examining the data available. The next section of this chapter examines how environmental policy evaluation has been carried out in WA.

Environmental policy evaluation in WA

Context

The following discussion firstly examines how environmental policy evaluation has been carried out in practice in WA through an examination of the relevant documentation. Unfortunately, most of these documents did not describe how any policy evaluation was carried out, and it was necessary to supplement this information with interviews with the key policy makers from each agency (the EPA and WAPC) to clarify the nature and extent of policy evaluation carried out.

Documented policy evaluation in WA

This section examines how evaluations of environmental policies have been, and are being, carried out. An examination of the relevant documentation revealed that neither the EPA nor the WAPC carries out formal evaluations; instead both agencies carry out reviews of existing policies that have been in operation for some time. The evaluation is embedded as part of that review and not a discrete process. Consequently, the evaluations have to be inferred from the documentation examined as part of this study, which revealed that only six EPA and three WAPC environmental policies have been subject to review and some form of evaluation. The six EPA policies are all Environmental Protection Policies (EPPs) and the WAPC policies are two State Planning Policies (SPPs) and one Region Strategy. They are:

- The 1992 EPP for the Goldfields Residential Areas controlling Sulphur Dioxide emissions from industries as they affect the residential area –Goldfields air EPP;
- The 1992 EPP for Kwinana controlling Sulphur Dioxide and dust from industries as they affect the residential area – Kwinana air EPP;

- The 1989 and 1993 EPPs to control Ozone depleting substances – Ozone EPP;
- The 1992 EPP protecting certain wetlands (lakes) on the Swan Coastal Plain – Lakes EPP;
- The 1992 EPP to protect water quality in the Peel Inlet–Harvey Estuary – Peel–Harvey EPP;
- The 1992 SPP to control land uses on Crown Land over the Gnangara groundwater mound – Gnangara SPP;
- The 1997 SPP defining land uses buffer distances for a range of industrial land uses – State Industrial Buffers SPP; and
- The 1996 Gascoyne Coast Region Strategy, setting out a broad land use strategy for the Gascoyne region.

The information used for this examination included published reports, interviews with the officers responsible for the policies and searches of the relevant agency files. It should be noted here that all of these evaluations were carried out by the agency which produced the policy and there have been no independent evaluations of any environmental policies in WA, although the review of the Peel–Harvey EPP did received some independent advice on the effectiveness of the policy.

The key questions in regard to the review/evaluation by the agency are:

1. Did the review of each policy also include an evaluation?
2. If so, how was the evaluation carried out, in particular –
 - a. which stages of the policy making process were evaluated?
 - b. what policy evaluation criteria were used?
3. What were the conclusions of any evaluation?

Tables 5, 6 and 7 below summarise this analysis for each policy. Table 5 shows which aspects of policy making were evaluated (i.e. process, content and performance), whereas Table 6 shows the evaluation criteria used. Table 7 summarises the conclusions of the evaluations for each policy as assessed by the agency. Detailed descriptions of these policies are not included here as these are more relevant to the discussion in the next chapter⁴.

⁴ Appendix 3 contains important background information on each policy.

Table 5: Summary of Western Australian environmental policy evaluation – aspects of policy making evaluated

Policy aspect evaluated/Policy	Process	Content	Performance
Goldfields air EPP		√	√
Kwinana air EPP		√	√
Ozone EPP (both)	√	√	√
Lakes EPP	√	√	√
Peel–Harvey EPP		√	√
Gnangara SPP		√	
State Industrial Buffers SPP		√	
Gascoyne Coast Region Strategy		√	
Totals	2	8	5

Table 6: Summary of Western Australian environmental policy evaluation – criteria applied in evaluations

Evaluation criterion/Policy	Performance effectiveness	Political support	Performance efficiency	Content relevance	Other socio-economic impacts	Social equity	Legal effectiveness/enforceability	Measurability	Innovation	Flexibility	Other
Goldfields air EPP	√			√							
Kwinana air EPP	√			√			√				
Ozone EPP (both)	√			√							
Lakes EPP	√			√							
Peel–Harvey EPP	√			√			√				
Gnangara SPP				√							
State Industrial Buffers SPP											
Gascoyne Coast Region Strategy											
Totals	5	0	0	6	0	0	2	0	0	0	0

Table 7: Summary of policy evaluation by the agency and the critical analysis of that evaluation

Policy evaluation/Policy	Agency evaluation				
	Successful	Successful but modifications required	Unsuccessful	No conclusion	No conclusion but changes needed
Goldfields air EPP		√			
Kwinana air EPP 1992	√				
Ozone EPP 1989 (both)		√			
Lakes EPP 1992					√
Peel–Harvey EPP					√
Gnangara SPP					√
State Industrial Buffers SPP				√	
Gascoyne Coast Region Strategy					√

A number of conclusions can be drawn from the above discussion. First, of the two agencies, the EPA makes a greater effort to evaluate its policies. Second, in general, evaluation is mostly a review of policy content, but some policies are also evaluated on policy performance (effectiveness). Of the five EPPs reviewed, effectiveness was part of the review for all of the policies, with the Goldfields, Kwinana and Ozone EPPs having demonstrated effectiveness. The EPA found it impossible to determine the effectiveness of the Lakes EPP, and the Peel–Harvey EPP had limited success in meeting its objectives (effectiveness).

Third, the WAPC does not carry out formal policy evaluations but relies heavily on stakeholders to indicate whether a policy is working or not. The WAPC uses two measures as *de facto* effectiveness measures: audits of recommendations and actions, and consistency of downstream decision making, although no formalised process is in place to track these decisions. Fourth, neither agency carries out a formal evaluation of the policy making processes.

Finally, neither agency was prepared to conclude that any of the policies reviewed here had been unsuccessful, although only one policy (the original Kwinana air EPP) was deemed to be successful outright with no modifications required. This is probably not surprising as the agency doing the evaluation was the agency responsible for the policy, and none of the policies have undergone an independent evaluation.

Given the limited nature and extent of policy evaluations carried out in WA, it was decided to interview the key policy makers in each agency to get a better understanding of how

each agency carries out policy evaluations. The results of these interviews are reported below.

Interviews with the key policy makers

Introduction

As noted above, these interviews were carried out as part of the method to establish the evaluation criteria to be used here. However, the interviews with the key policy makers in both the EPA and WAPC also revealed some useful information about the nature and extent of their agency's current policy evaluation practices and is examined here. The people interviewed had primary responsibility for policy making and were either on the boards of the EPA and WAPC or were the senior officers responsible for policy in the two Departments that support those agencies (the Department of Environment and Conservation [DEC] and the Department for Planning and Infrastructure [DPI]).

EPA

Below is a sample of the views of the key policy makers in the EPA regarding how the agency does policy evaluation.

We haven't really done any sound evaluations of EPPs. I mean, we do reviews of EPPs, but I don't think they are evaluations. And I think that it would be valuable to actually establish some small committees of enquiry in relation to the seven year reviews. To actually make a report on that EPP and on its failings and its benefits. Because I think that would help the system. But you see, what we tend to do is we've got an EPP coming up, we've got six months, let's roll it over.

I don't think it [evaluation] is that difficult to do at the policy level. What is difficult is to convince people that they should do it, and there are two reasons. They have got to budget for it, it costs effort, money and time to do it in the first place. And secondly, it exposes the effectiveness of the instrument. As I said earlier, public policy making is more about having one, rather than seeing if it is effective or not, by and large... I don't think it's difficult, but I think it's been done very poorly across the board, that's my summary statement.

This suggests two things. First, policy evaluation by the EPA involves largely reviewing the policy content and mostly does not go into broader questions like effectiveness and evaluation of the policy formulation process. When Subject 1 refers to evaluation – "I don't think they are evaluations" – he/she is referring to determining policy "failings and its benefits", which is another way of saying policy effectiveness.

Second, there are three significant barriers to the EPA doing more thorough policy evaluation. The first one is time: whilst the EPA is required by law to review EPPs every

seven years, in most cases the policy review process starts very late in the statutory cycle, meaning that there is usually only time to evaluate the contents of the policy. This limited evaluation does not deal with broader evaluation issues including policy effectiveness, and usually results in little, if any, content change: “we’ve got an EPP coming up, we’ve got six months, let’s roll it over.”

The second barrier is lack of resources: as one interviewee noted when expanding on why it is difficult to do policy evaluations “it costs effort, money and time to do it in the first place”, suggesting that they don’t have resources available to do evaluations. The third barrier is clearly a political one: there is a risk that a proper evaluation may actually show that a policy has failed and not delivered on its policy objectives. Policy making is, therefore, “more about having one rather than seeing if it is effective or not, by and large”.

To sum up, consistent with the conclusions of the evaluations of the individual policies, the EPA policy evaluations are limited in scope to a review of their contents, with some effort made to measure effectiveness in some cases, which is largely because of limited time and resources available. There is a reluctance to determine policy effectiveness, because the results of such an analysis may prove to be politically sensitive – i.e. the policy may not be working and achieving its objectives. However, as shown above, despite this reluctance, all of the EPPs reviewed have included considerations of policy effectiveness, with the limited scope and technical EPPs receiving the most thorough effectiveness evaluations.

Effectiveness evaluations of the EPA's other policies has not been done.

WAPC

Turning to the WAPC, here is a sample of the comments of the key policy makers in that agency regarding their policy evaluation.

At the moment it’s a judgement that people will make about whether they think this is good. We don’t actually have any formal, to my knowledge, way of judging that other than, I suppose, you run a review process, and you take comments and you get input. So, people will tell you if its good or not ... At the moment, we don’t have anything quantitative to say, we’ve got x% of Schemes and y% of decisions have been made in accordance with this policy, and the result is we’ve got a better environment in the end because we can measure that.

Really, there’s no system for monitoring, because the policy is essentially restrictive. So, what would happen if a proposal came along for residential development outside residential zoned land it would be refused. We wouldn’t necessarily count the number of refusals we got, it would simply be refused. If it’s within residential zoned land then the responsibility would rest with Local Government to impose the condition because the Commission isn’t the development control authority. Now, we haven’t at his stage thought of having a system for counting how many applications for residential development are lodged and whether the condition has been imposed. There may be

some value in that, but essentially, their only value there would be if there is likely to be a deferential application of the policy but we're not anticipating that that would be the case.

It's quite difficult, because I don't think we actually sit back and worry about it. Usually, if it's not successful, we have to re-do it, or revise it in a rush as happens. Maybe every year we could do a general stock take. It's difficult to envisage a comprehensive way of doing it without doing a study again.

I suppose the difficulty with determining whether these things have been successful is because of the time scale involved ... It's very hard to measure really success in a quantifiable way. As I said right at the start, we also have a problem with timescales ... we do the audit for the State Planning strategy because we are required to, but that is very much a case of "that's been done, tick it off, that hasn't been done" or whatever it is. It isn't measuring at all whether having responded to the recommendations the response was good, bad or indifferent.

Time is another factor as well. If you are talking about a strategy and land use that has got a horizon of 10 to 1,000 years you got to have time to reflect as to whether it has been successful or otherwise. What you are really measuring in the first few years is the unrest really. If there isn't any, then you presume that it must be OK, but it's not necessarily OK. If there is unrest then you know. But I guess that that is a fact.

Three conclusions can be drawn from these comments. First, the WAPC policy evaluation process is based on the views of stakeholders and the community about whether they believe the policy is working or not.

We don't actually have any formal, to my knowledge, way of judging that other than, I suppose, you run a review process, and you take comments and you get input. So, people will tell you if it is good or not.

What you are really measuring in the first few years is the unrest really. If there isn't any, then you presume that it must be OK, but it's not necessarily OK. If there is unrest then you know.

This suggests that the WAPC has two different ways in which policy reviews are initiated. The first is an agency initiated review process where the community is invited to express a view about the policy. If the comments on the policy are generally favourable, then the policy is regarded as being successful and requires minimal change. The second process is where stakeholders and the community express a clear view that the policy is not working and they seek a review of the policy. The review only happens because the community and stakeholders seek a change to the policy. In both these cases, the key measure of policy success is whether the stakeholders and the broader community believe that the policy has worked or not. This is the same as the "political support" generic criterion established earlier in this chapter.

Second, whilst political support is used as a measure of effectiveness, it is really a perception of effectiveness only and the WAPC makes no obvious effort to actually determine effectiveness. WAPC policy makers acknowledge that they do not actually determine policy effectiveness and argue that the key barrier to measuring effectiveness is the implementation timescale for their policies.

I suppose the difficulty with determining whether these things have been successful is because of the time scale involved.

Time is another factor as well. If you are talking about a strategy and land use that has got a horizon of 10 to 1,000 years you got to have time to reflect as to whether it has been successful or otherwise.

The third conclusion is that as well as using political support as a measure of success, the WAPC also uses two other key measures of success:

- The results of an audit of the policy recommendations and actions; and
- Decision making is being carried out consistent with the policy.

Whilst the WAPC is doing some audits of policy recommendations and actions — “we do the audit for the State Planning strategy because we are required to, but that is very much a case of “that’s been done, tick it off, that hasn’t been done’ or whatever it is” – it has not set up any formal mechanisms to check that downstream decision making is consistent with policies — “At the moment, we don’t have anything quantitative to say, we’ve got x% of Schemes and y% of decisions have been made in accordance with this policy’ ...”.

To sum up, when the WAPC carries out a policy review, it uses “political support” as a surrogate for policy effectiveness. The long timeframes for most planning policies is the reason WAPC policy makers choose not to do proper effectiveness evaluation. Broader policy evaluation is attempted using consistency of downstream decision making and audits of the policies’ recommendations and actions as measures of effectiveness.

Results of the interviews

Introduction

Responses from step 2 were placed, where possible, into one of the eleven categories used earlier in this chapter (Table 2). Where criteria could not be placed into one of these categories they were either placed into the other category, or where a significant number of interviewees identified a particular criterion, this was included as a new criterion.

Results

Table 8 below sums up the analysis of the interviews following step 2 of the Delphi process and provides a comparison to the analysis of international studies covered earlier in this chapter. Discussion about comparisons to the international literature will be made later.

Table 8: Summary of criteria that interviewees would use to evaluate environmental policy compared to the international studies

Generic criterion	No. interviewees who would use criterion (total 15)	No. studies that used criterion (Total 15)
Performance effectiveness	9	13
Performance efficiency	2	12
Other socio-economic impacts	2	11
Political support	11	7
Content relevance	6	6
Social equity	2	5
Measurability	0	4
Flexibility	1	4
Legal effectiveness/ Enforceability	0	3
Innovation	1	3
Other	14	2
Significant other criterion		
Changing downstream decision making consistent with policy	11	0
Raising awareness of the issue	5	0
Audit of implementation actions	5	0

It should be noted that the 14 other criteria listed in Table 8 were all different.

Table 9 below provides a more detailed analysis of this data. It shows the evaluation criteria used in actual environmental policy evaluations, the views of the key policy makers in the EPA and WAPC, the views of relevant stakeholders and, finally, the review of environmental policy making worldwide. It should be noted that in this analysis the data for the key policy makers has not been quantified but the results are shown as an agency view about the criteria used in evaluations.

Table 9 and a detailed analysis of the interviews formed the basis of formulating a draft set of evaluation criteria used here. The discussion below sets out that analysis.

Table 9: More detailed analysis of the evaluation criteria, interviewee data and international studies

Generic criterion	No. of times criterion used in actual environmental policy reviews	Criteria preferred by the key policy makers in the EPA and WAPC	No. WA policy makers/stakeholders who would use criterion (total 15)	No. international studies that used criterion (Total 15)
Performance effectiveness	5	√	9	13
Performance efficiency	0	-	2	12
Other socio-economic impacts	0	-	2	11
Political support	1	√	11	7
Content relevance	6	√	6	6
Social equity	0	-	2	5
Measurability	0	-	0	4
Flexibility	0	-	1	4
Legal effectiveness/ Enforceability	2	-	0	3
Innovation	0	-	1	3
Other	0	-	14	2
Significant other criterion	0	-	0	0
Changing downstream decision making consistent with policy	0	√	11	0
Raising awareness of the issue	0	-	5	0
Audit of implementation actions	0	√	5	0

Analysis

A number of conclusions and discussion points can be drawn from the information in Table 9 and analysis of the interviews. The first relates to the use of effectiveness as an evaluation criterion. Of the top four criteria used in international studies only performance effectiveness and political support are in the top criteria as seen by policy makers and stakeholders in WA. As noted previously, the EPA includes effectiveness in its policy evaluations, but not the WAPC. This difference is also reflected in the interviewees' responses on this issue in that all of the environmental policy makers from the EPA, the environmental community, industry and consultants believed that effectiveness should be

included as a measure of policy success, whereas the planners preferred other measures. These responses below typify the differences.

You really get down to the objectives of the policy and how well it met its objectives ... That's the more quantitative side of policy. If in Cockburn Sound the objective is to reduce concentrations of nutrients 20% over 20 years and you only achieve 10% then that's obviously an indication of the effectiveness of the policy

- *from EPA policy maker.*

How do I measure success? It would be easy to say how many widgets are saved, and to a certain extent that's it. Yes, to a certain extent it's how many wetlands or whatever have been saved.

- *from the environmental community.*

The success of the policy other ... is really measured by, well, I think it really goes back to acceptance, because ... if, for example, a policy is patently not working then there would be calls from stakeholders or others to change it ... So, I think it really goes back to that point about acceptance, recognition and consideration by stakeholders as to the effectiveness of the policy. I think this is part of the nature of Planning because it's so broad and general, to introduce other than broad qualitative measures would be very very difficult. Not only in measuring the effectiveness of policy once in effect, but also in measuring the likely effectiveness of a policy when it is being developed, the reaction and views of others is absolutely critical. (

- *WAPC policy maker.*

This suggests that there is a fundamental difference between the purely environmental policies of the EPA and land use policies and strategies of the WAPC with significant environmental focuses. Land use policies and strategies are likely to be complex covering a range of environmental issues as well as broader socio-economic issues. Environmental policies, on the other hand are more likely to focus on a single environmental issue. This complexity of land use policies and strategies makes it more difficult to measure to set up effectiveness measures.

It should be noted that while most of the environmental interviewees wanted effectiveness measures as part of policy evaluation, not all EPA policies included direct measures of effectiveness in evaluations. This is because some of the EPA policies are more complex than others, and as one interviewee noted:

There are some policies that are narrow and deal with something specifically, there are other policies, high level policies, that more lead to broad policy change and broad strategic direction and things and they're a bit more subtle about how you measure those

- *from an environmental agency.*

Another complication is that some EPA policies apply in areas where there are other policies and management measures at work, which makes it difficult to identify what has been the cause of any environmental improvement (effectiveness), for example:

Let's look at Jandakot mound [policy] ... It's not the only instrument working there of course, you've got all the Groundwater Regs as well. Picking up the signal in the noise is pretty hard to do.

Several interviewees also noted the problem of timescales in measuring effectiveness as being a reason that other measures of success are needed, for example:

I suppose the difficulty with determining whether these things have been successful is because of the time scale involved. I'm making that comment because the regional strategies that we've done ... if you think about it we have only been doing them for about 15 years. ... The vast majority of the regional plans that now exist were, basically, done from the beginning of the 1990's onwards. So, I'm mentioning that because most of them have a timeframe of somewhere around the 20–30 year mark looking forward, and for a lot of the policy prescriptions they are putting in place and the recommendations and actions, and all that sort of thing, it would be difficult to judge whether they are being successful or unsuccessful for some years after they actually start being implemented. The point I'm making is that at this stage in their lifecycle we can see whether there is something fairly obviously going right or wrong but the ultimate proof of the pudding, I would suggest, is some years away with most of them.

This is certainly a reasonable point, and the move by the EPA to carry out State of the Environment reporting is a more strategic way of addressing effectiveness in overall environmental planning, policy making and management. As noted by the EPA, the key purposes of State of the Environment reporting are:

State of the Environment Reporting (SOER) is an informing system. Its key function is to communicate credible, timely and accessible information about the condition of the environment to decision makers and the community ... The SOER also analyses the effectiveness of policies and programs designed to respond to changes in the environment. This improves the targeting of resources to achieve better environmental outcomes.

(EPA 2005)

SOER becomes a more systematic way of measuring effectiveness, not just of what the EPA is responsible for but the sum of the environmental planning, policy making and management carried out by government, organisations and individuals. The effectiveness of individual policies within that holistic framework is more difficult to determine.

These constraints on carrying out effectiveness evaluation have led to the criterion stakeholder and political support being used as a surrogate for effectiveness. This is much

easier to determine through the use of surveys and analysis of public submissions. As well, stakeholders can be specifically asked whether they believe that the policy has been effective in delivering positive environmental outcomes. Of course, it can also be argued that the lack of good effectiveness evaluations shows a lack of sophistication in policy development and evaluation. As noted previously, policy makers may not want to know how effective a particular policy is, as it could either be bad news (any environmental improvement may not be real but a perception only) or raise awkward questions about best use of resources and whether other policy options should be tried instead.

The second conclusion is that, unlike in the international studies, WA environmental policy makers, across the spectrum, use the criterion changing down-stream decision making consistent with policy as an important measure of success. This involves two matters: whether the agency itself, through its own subsequent decision making uses the policy and secondly, whether other agencies and industry that are affected by the policy change their decision making to be consistent with the policy. As one planner noted of decision making in the agency in relation to a policy considered to be unsuccessful:

Our successful policies are ones that we use all the time. There are some policies that are done in our policy manual that nobody uses. It was just something that seemed to be good at the time. For instance, like planning over sensitive water management areas which was done in an era when it was important to make a statement about that. We produced a policy on it that's in our manual, but nobody takes any account of.

Policies that require other agencies to change decision making are considered higher level policies. This is particularly true of planning policies and strategies:

It's very hard to measure real success in a quantifiable way ... but if you want to use just a couple of measures, and these are more qualitative measures rather than quantitative measures, it really is the extent to which the recommendations from strategies get adopted through local Town Planning Schemes (a WAPC policy maker)

It could be argued that the fact that a policy gets used and changes down-stream decision making is really a measure of political support, in that if the policy has stakeholder support it will get used by other agencies in their own decision making. In this way, it is also a surrogate measure of policy effectiveness in that changing down-stream decision making can be seen as a positive outcome in that the policy is being implemented and environmental protection or improvement should follow.

A third conclusion that can be drawn is that WA environmental policy makers and stakeholders show little interest in the other two top four criteria used in international studies – performance efficiency and other socio-economic impacts. The lack of interest in performance efficiency likely reflects the lack of emphasis on effectiveness evaluation. Efficiency in economic terms can be seen as “the extent to which the instrument has

enabled a more cost-effective achievement of policy objectives than some alternative measure' (Barde and Smith 1997:24). In the absence of being able to determine effectiveness it is not possible to determine efficiency.

The lack of interest in other socio-economic impacts is probably not surprising for the policy makers in the EPA, but is a surprising view from the planners who normally have to balance a range of competing interests in developing a policy or strategy. One environmental consultant noted of Bush Forever (a WAPC policy):

I don't know that the social impacts have been properly evaluated, except from a minority political perspective. I don't think the economics are right.

Finally, there are two other criteria not given attention in the international studies but are rated moderately highly by interviewees, being raising awareness of the issue and audit of implementation actions. Raising awareness relates to the educative benefits of developing and creating a policy, for example:

I think the water quality ones like Peel-Harvey and Swan-Canning have succeeded to the point of helping change the climate of how things are done⁵. For example the combination of the EPP and SPP in Peel-Harvey has helped changed the way things get looked at in the Peel-Harvey catchment.

The buffers worked because it raised the issue in the Planning system, its education value, and it's been drawn on in a couple of cases.

The first thing they [policies] do is lift awareness, that is the critical first step, and we'll take that and we'll be thankful for it.

To sum up, the three main criteria preferred for use in evaluating policy by environmental policy makers and stakeholders in WA are changing downstream decision making consistent with policy, political support and policy effectiveness. Despite effectiveness being an important evaluation criterion for WA environmental policy makers and stakeholders, not a lot of work has been done in determining policy effectiveness. It was suggested, therefore, that the criteria political support and influence on downstream decision making are used by policy makers as *de facto* or surrogate measures of effectiveness.

Identifying evaluation criteria

This brings us finally to a discussion as to which criteria should be used to evaluate environmental policy making in WA in highly contested contexts. It should be remembered that the criteria will be used to evaluate the policy making of some draft policies, and this will constrain the use of some possible criteria or at least require some modification as to how to apply them.

⁵ This can be interpreted as a measure of success – the degree to which the problem is seen by people, as influenced by the policy

First, it is clear that policy effectiveness should be included as a criterion. For simple environment policies being implemented with limited scope and straightforward implementation mechanisms, quantitative effectiveness should be used: i.e. that there should be a measurable improvement in the environment to the extent set out in the policy. Quantitative measures of effectiveness for more complex policies are more problematic, and it is considered that the arguments made earlier in this chapter in this regard have merit. The uses of quantitative measures for draft policies are even more problematic. Therefore it is proposed that for these policies, where either any environmental improvement would take many years to be observed, and/or the implementation mechanisms are complex involving a number of different agencies, or implementation has yet to occur (draft policies) then the impact on agency decision making will be used as a surrogate of policy effectiveness. This criterion is titled 'changing downstream decision making consistent with policy'. The argument that it is difficult to measure actual environmental improvement and then tie it directly to the policy, is a compelling one, particularly for draft policies, but clearly some measure of effectiveness is needed. 'Changing downstream decision making consistent with policy' has two aspects that reflect policy effectiveness as already noted. First, where other agencies adopt their own policies and decision making to be consistent with the overall policy, then environmental protection is more likely, provided that policy content is appropriate. Second, appropriate action by these agencies shows a level of political support for the policy which reflects confidence in the policy's likely effectiveness. This latter point has resonance with the next criterion. This argument also holds true for draft policies, especially draft EPPs: as already noted in Chapter 1, draft EPPs attain an automatic level of authority given the high level statutory nature of any final EPP, and because most draft EPPs are drawn from the EPA's project EIA work they gain a level of endorsement because of those assessments.

It could be argued that changing downstream decision making consistent with policy is not strictly policy effectiveness as it is normally applied in the literature as measured environmental improvement. For clarity, this criterion will be titled 'policy-making performance', which will have two possible measures: effectiveness or changing downstream decision making, the choice of which depends on the nature of the policy and whether it is a final or draft policy.

There is widespread support both internationally and with the WA environmental policy community for the use of the criterion 'political support' and it is therefore proposed to be used here. Political support can be determined in several ways, notably: the ease with which the policy is finalised; the views of the policy making community; and the views of the key stakeholders. As already noted, to some extent, political support reflects a general view that the policy is or will actually deliver a good environmental outcome (i.e. it will be effective). This criterion should, however, be seen as broader and therefore different from policy effectiveness. Political support reflects on the policy formulation process, an area of policy making not well evaluated. As already argued in this thesis, appropriate and

comprehensive participation during the formulation of the policy not only ensures political support, it also ensures that the content of the policy addresses the environmental issues and community and stakeholder concerns. Participation also ensures that the best available information is provided to policy makers.

The third criterion proposed here is content relevance. Clearly, the agencies already do a lot of work when they review policies to assess content relevance, which suggests that it is relatively easy to do. It also just makes sense: it's important that the policy has content relevant to the problem at hand. Evaluating content relevance needs to be done carefully, particularly if the evaluation is carried out several years after the policy was finalised. Two questions need to be asked: was the content relevant for the time it was written, and, is the content still relevant today? The first question is actually about the success of the policy at the time it was in use, and the second question is more about the relevance of the content to today's context. This takes us back to a point made in the Introduction, that the policy success or failure in cases where effectiveness cannot be easily demonstrated can be subjective, and, as well, may vary as the social contexts changes over time. It can be argued that a policy's content was appropriate for the time that the policy was in use (i.e. was successful) but that it needs to be amended to reflect changes that have occurred since that time, both in relation to information available and the socio-economic context. The original 1989 Ozone Depleting Substances EPP, as discussed in the next chapter, is a good example of this.

The final criterion recommended here is other socio-economic impacts. Whilst few environmental policy makers and stakeholders in WA have given much attention to this criterion, it is difficult to argue against its inclusion given its broad use internationally. It was noted earlier that policy evaluation in WA is not well developed, and one way that it can improve is to look at this issue of unintended consequences. Measuring these impacts may not be simple, but it is likely that stakeholders in a particular environmental policy will raise concerns about this issue (see discussion on the Lakes/Wetland EPP in Chapter 5 as an example).

As well, the criterion other socio-economic impacts is particularly relevant to highly contested policy making contexts. Reducing conflict and social learning are important outcomes of policy making in these contexts and should be included in evaluations.

It is worth finishing with a discussion on why some of the criteria have not been included. First, one of the most used criteria in international literature, performance efficiency has not been included, largely because of the difficulty in determining efficiency without doing quantitative policy effectiveness for all policies. As already noted, many environmental policies, and most of the more recent ones with highly contested contexts, are complex, both in terms of the issues involved and the means of implementation. Further, it is highly unlikely that environmental improvement will be seen in the short to medium terms. It is

difficult, and probably unfair to place these policies under the sort of political pressure that would follow, should economic efficiency need to be measured.

The two criteria that had moderate support with policy makers and stakeholders in WA — raising awareness of the issue and audit of implementation actions — were also excluded. The first was excluded because raising awareness can be seen as an added benefit of the policy rather than a measure of success; further, it is difficult to actually measure. The second was excluded because auditing is a bookkeeping process, and the real actions that are relevant to the success or failure of the policy are whether other agencies and decision makers actually change their own policies and decisions. It is also relatively simple to do, and its inclusion as a measure of policy success could encourage agencies to do the easy work and avoid the real issues of policy evaluation.

To sum up, the criteria recommended for environmental policy making evaluation in this study are:

- Policy-making performance
 - for simple limited-scope policies that have been finalised and which have simple implementation measures — policy effectiveness or quantitative environmental improvement consistent with the policy objectives will be used,
 - for complex policies with long time frames for implementation and/or complex implementation mechanism, and for draft policies – downstream decision making is consistent with policy or draft policy will be used;
- Political support — any of
 - the ease with which the policy is finalised, if at all,
 - the views of the policy making community, and
 - the views of the key stakeholders;
- Content relevance (taking into account the appropriate socio-economic context); and
- Other socio-economic impacts.

The final step was to then send these draft criteria back to the individuals interviewed as part of this work to see feedback. As noted in Chapter 3, none of the individuals made any comment on these criteria, and it assumed that a consensus had been reached that these criteria were acceptable.

A final question remains: how should these criteria be used in determining policy making success or failure? Put another way, does an evaluation need to show a positive outcome for all of the criteria for the policy making to be considered successful? It is intended that these criteria be seen as critical *descriptors* of success rather than determinants of success. For example, if an evaluation shows positive outcomes for the first three criteria but

negative outcomes on the last criteria, then that policy making can be said to be successful in that it delivers on performance, has political support and is relevant to the environmental issue of concern, but has been unsuccessful in that it has some socio–economic costs. This produces a policy making evaluation process that highlights the key areas of successful policy making rather than allowing for some absolute statement of success or failure. It is argued here that these four criteria are the most critical for successful policy making. These criteria are, therefore, qualitative descriptors of success rather than quantitative measures of success.

Summary

The international literature on policy evaluation focuses on three aspects of policy making:

- The policy formulation process;
- Policy content; and
- Policy performance, both direct (performance on objectives), and ancillary impacts (other environmental impacts and broader socio–economic impacts).

Three broad approaches to evaluation are used:

- A general systematic approach to evaluation without using fixed evaluation criteria, which was used primarily to evaluate single policies rather than a number of policies at one time;
- Quantifying policy effectiveness; and
- Specifying a set of qualitative criteria that are to be used to compare various policy initiatives.

The third approach would seem most suitable for use here where the highly contested policy making context is studied.

Whilst no consensus exists about which criteria to apply to evaluate environmental policy, four criteria were most commonly used, suggesting they have some acceptance in the environmental policy evaluation community:

- performance effectiveness,
- performance efficiency,
- other socio–economic impacts, and
- political support.

Most attention is given to evaluating policy content and performance with little effort made to evaluate policy formulation process.

In WA, nine policies have had some level of evaluation carried out (six by the EPA and three by the WAPC), and each evaluation was carried out by the agency that actually

developed the policy: that is, there have been no independent evaluations carried out. The review of this work allowed the following conclusions to be drawn:

- Of the two agencies (EPA and WAPC), the EPA makes a greater effort to evaluate its policies;
- Evaluation is mostly a review of policy content, but some policies had limited evaluations of policy performance (effectiveness);
- The WAPC does not carry out formal policy evaluations;
- Neither agency carries out a formal evaluation of the policy making processes; and
- Neither agency was prepared to conclude that any of the policies reviewed had been unsuccessful.

This analysis was followed up with a series of interviews with the key policy makers from these agencies and the following additional conclusions can be drawn:

- Policy evaluation by the EPA involves largely reviewing the policy content and mostly does not go into broader evaluation questions like effectiveness;
- There are three significant barriers to the EPA doing more thorough policy evaluation – time constraints, resource constraints, and that policy evaluation is not seen as having a high political priority;
- The WAPC policy evaluation process is based on the views of stakeholders and the community about whether they believe the policy is working or not;
- The WAPC uses political support as a measure of effectiveness, but it is really a perception of effectiveness only and the WAPC makes no obvious effort to actually determine effectiveness;
- The key barrier to the WAPC improving its policy evaluation is the long timeframes of these policies and the difficulties in seeing environmental improvements in the short to medium term; and
- The WAPC relies heavily on stakeholders to indicate whether a policy is working or not, and two *de facto* measures of effectiveness – audits of recommendations and actions, and consistency of downstream decision making, although no formalised process is in place to track these decisions

Interviews with policy experts in WA were then used to arrive at a set of policy making evaluation criteria. Following that work, these criteria are recommended for use in evaluating policy making:

- Policy-making performance
 - for simple limited-scope policies that have been finalised and which have simple implementation measures — policy effectiveness or quantitative

environmental improvement consistent with the policy objectives will be used,

- for complex policies with long time frames for implementation and/or complex implementation mechanism, and for draft policies – downstream decision making consistent with policy or draft policy will be used;
- Political support — any of
 - the ease with which the policy is finalised if at all,
 - the views of the policy making community, and
 - the views of the key stakeholders;
- Content relevance (taking into account the appropriate socio–economic context); and
- Other socio–economic impacts.

The final question of how should these criteria be used in determining policy making success or failure was answered by suggesting that these criteria be seen as critical *descriptors* of success rather than determinants of success. This allows evaluation to highlight the key areas that have been successful rather than making some absolute statement of policy making success or failure: they are qualitative descriptors of success rather than quantitative measures of success.

The context is now set for a detailed analysis of environmental policy making in Western Australia in Chapter 5.

Chapter 5 — Evaluating WA environmental policy making

Introduction

As noted in Chapter 1, this thesis examines environmental policy making in highly contested contexts. The hypothesis here is that the adaptive–collaborative approach to environmental policy making is the approach that is most likely to be successful in contexts where conflict is deeply embedded as part of policy making. This chapter tests this hypothesis by examining the policy making of the WA EPA through an analysis of their key policies: the Environmental Protection Policies (EPPs). For practical reasons, the policies of the WAPC are not considered further in this thesis as it was considered that focusing on the policy making of one agency allows for greater depth of coverage and analysis.

For each EPP studied, three key areas will be examined:

- Identifying the policy making approach adopted based on the four broad approaches identified in Chapter 2;
- Evaluating each policy making against the criteria proposed in Chapter 4; and
- Identifying the nature and extent of conflict, and linking this to the policy making evaluation and the policy making approach.

This will allow the links between conflict management, policy making approach and policy making success to be explored as a test for the thesis hypothesis. The final part of this chapter is an analysis of the overall policy making of the EPA by drawing on the individual policy making evaluations and additional information drawn from the long interviews with key individuals and individuals representing key stakeholder groups.

As noted in Chapter 3, the data used for this analysis were: published information relevant to each policy, departmental file searches, short interviews with the relevant departmental officers responsible for each policy, and long interviews with key policy makers and relevant stakeholders. In part, the long interviews provided information on the political support policy evaluation criterion.

Table 10 below lists all of the environmental policies that either were subject to an EPA review (evaluation) or where a significant number of interviewees identified it as either succeeding or failing. It shows the results of any EPA evaluation and the perception of

success or failure from the interviewees. The full list of policies mentioned in the interviews is provided in Appendix 2 along with a summary of the relevant interviewees' responses⁶.

Two observations can be made about Table 10. Concurrence between the evaluations of EPA and the interviewees' perception of success/failure was only achieved with three EPPs — the 1992 Kwinana air quality EPP and the 1988 & 1992 Goldfields air EPPs. For the most part this was not because of disagreement between the EPA and the interviewees, but because the agency review did not arrive at a conclusion one way or the other about a policy's success, there was no agency evaluation carried out at all, or the experts did not express a strong view one way or the other about a policy's success or failure.

Table 10: A comparison of the policy evaluation from the two sources: agency and interviewees' views

Policy	Conclusion of agency evaluation	Consensus of interviewees		
		Summary	No agreed successful	No agreed unsuccessful
Goldfields air EPPs 1988 & 1992	Both successful but modifications required.	Both successful	4	0
Kwinana air EPP 1992	Successful.	Successful	10	0
Kwinana air EPP 1999	No review carried out.	No clear consensus	0	0
Ozone EPP 1989	Successful but modifications required.	No clear consensus	1	0
Ozone EPP 1992	Successful but modifications required.	No clear consensus	1	0
Lakes EPP 1992	No conclusion but changes needed.	Successful	8	0
Wetlands EPP 2004	No review carried out.	No clear consensus	0	2
Peel–Harvey EPP	No conclusion but changes needed.	Unsuccessful	1	4
South West wetlands	No review carried out.	Unsuccessful	0	6
Swan Canning EPP	No review carried out.	Unsuccessful	0	6

Second, there are no policies where interviewees' judgement of success or failure differed substantially, in that each of these policies is perceived to have either clearly succeeded, clearly failed or there is no clear view expressed. Put another way, there is no policy where there are a significant number of views both ways about the policy's success or failure. As can be seen from Table 10, all except one policy had either zero or one dissenting view

⁶ It should be noted that whilst this chapter focuses on EPA policies, Appendix 3 also makes reference to the policies of the WAPC.

about the policy, with one policy having 2 dissenting voices. This suggests that the *perception* of policy success or failure is uniform across the interviewees.

Policy making of 10 policies will be the subject of evaluation using the criteria established in Chapter 4. These 10 had sufficient information available to complete the analysis. These policies are:

- The draft Western Swamp Tortoise EPP;
- Kalgoorlie air quality EPPs (1988 & 1992);
- Kwinana air quality EPPs (1992 and 1999);
- Lakes EPP (1992);
- Draft Wetlands EPP (1999);
- Ozone EPPs (1989 & 1992); and
- Swan Canning EPP.

It should be noted that two of the policies evaluated were draft, not final EPPs. Some initial discussion as to the reasons why this is possible were mentioned in Chapter 1. Evaluation of the policy making of these draft policies is possible for four reasons. First, the strong legislative nature of EPPs gives draft EPPs a certain status within government. Second, the EPPs remained as drafts for several years and represented the policy positions of the EPA during that time. The EPA applied the provisions and principles of those draft policies through various assessments of individual proposals (EIA) before and during the main data collection and writing up of this study. In the case of the draft Wetlands EPP, the Minister decided not to proceed with the EPP, noting that the EPA could apply the principles of the draft policy through its on-going EIA of individual proposals. Third, the existence of a draft EPP and the application of its objectives through EIA meant that the key agencies responsible for downstream decision making had to choose whether to adjust their own decision making to be consistent with the draft policy. As will be seen below, the response to draft EPPs by these agencies was mixed. Finally, the evaluation here is about policy making and not just the contents of the EPP. The process for policy formulation and the process set up to make decisions about the EPP are significant elements of policy making and can be readily evaluated for draft EPPs.

In the case of the Western Swamp Tortoise EPP, the final EPP was significantly different from the draft, suggesting that any evaluation of the policy making of the final EPP could be different from the draft. The final EPP had not been in operation long enough for sufficient data to be collected to allow policy making to be evaluated: however, based on the results of the evaluations of the policy making of the draft EPP, some comment will be provided on the final EPP.

Individual policy making evaluation

Introduction

The policy making of each policy is evaluated separately. Appendix 3 gives detailed supplementary information on each policy, with only the information relevant to subsequent discussion extracted and presented here. This information is also useful in identifying the policy making approach adopted and the evaluation. Each section concludes with an analysis of the nature and extent of conflict in the policy making, the appropriateness of the broad policy making approach adopted, and reasons identified by interviewees for policy success or failure, where sufficient information was available from the interviews.

The data used for evaluation included the following:

- For policy-making performance of simple limited-scope and finalised policies, the published results of environmental improvements on the key policy objectives were used, as discussed in the EPA reviews of the individual policies (see Chapter 4) or other sources;
- For policy-making performance of complex policies with long implementation timeframes, and the draft policies, the subsequent decision making of the relevant agencies is examined for consistency with the EPP;
- For political support length of time taken to finalise the policy is a consideration as well as documented opposition from key stakeholders primarily during the policy making process but also as part of any implementation. The views of the interviewees are also considered as they can all be considered key stakeholders;
- For content relevance the key considerations are the extent to which the EPP in question required changes to its content, and the extent to which the content was criticised by, especially, but not limited to, the interviewees; and
- For other socio-economic impacts documented socio-economic impacts as well as the views of the interviewees.

Draft Western Swamp Tortoise EPP (1994)

Policy description and background

A draft EPP was released in 1994 (EPA 1994) and had as its primary aim the protection of the only two known habitats of a critically endangered species, the Western Swamp Tortoise (located just north of Perth). These two habitats are within Reserves managed by the State's conservation agency, the Department of Environment and Conservation (DEC),

but they are significantly affected by land use on the surrounding private land (see Plate 1). The EPP sought to control land use on private land so as to protect these habitats.

Plate 1: Twin Swamps Nature Reserve – one of the remaining habitats of the Western Swamp Tortoise (Source: Garry Middle).



The conservation movement had been calling for the EPA to act to protect these habitats for some time. As one prominent member of the conservation movement noted:

With some of them [EPPs] there has been such a harsh battle to get them up that, for example the Western Swamp tortoise one, they [the EPA] just didn't have the guts to actually finalise that EPP when it came down to it. I know it has been finalised now but it took 10 years.

The draft EPP identified the key threats to the two habitats as being: fire; predation (particularly from foxes and domestic cats); changes to water quality and quantity; and growing human pressures because of increasing population in the catchment. The first two threats can be managed directly in the Reserves by providing fire breaks and using vermin proof fencing — although increasing human population in the area surrounding the Reserves does increase the risk of fires within the catchment and likely leads to an increased cat population (predators) as well. Increasing urbanisation of the catchment also has the potential to change the hydrology of the area, thus changing the hydrology of the Reserves and of the tortoise habitats. The increasing threats to the tortoise habitats from outside the Reserves are what primarily drove the EPA to initially propose that land use on private land should be directly controlled through the EPP. The EPP received strong

opposition from the private land owners, the WAPC and the affected local government, and it took nine years before these issues were resolved and the EPP finalised. As one of the policy makers from the EPA noted:

I think we are about to have the policy published, but there's still a hell of a lot of pain and agony about land use within that area, so I don't think it has worked too well.

The main concern of private land owners was that the policy would put significant restrictions on what activities could be carried out on their properties and the extent of any subdivision, thus potentially either affecting farming incomes or reducing the property value of their land because of the subdivision restrictions. These concerns were compounded by the lack of any compensation for these losses and by what the land owners saw as inadequate consultation. Whilst most land owners were aware that the EPA was developing a policy in the early 1990s, the first time that land owners became aware of the proposed land use controls was when the draft policy was first released. This level of participation equates to IAP2 (2007) Consult level, or, as perceived by the land owners, at the "Inform" level.

The science that supports the policy is at best uncertain and has been highly contested by several of the stakeholder groups. As the EPA itself noted:

Although the relationship between groundwater, surface water flows and the swamp systems within the Ellen Brook and Twin Swamps Nature Reserves is not well understood, an examination of available information has determined approximate surface water catchments for the habitat swamp areas in each of the Nature Reserves.

Research undertaken by the CSIRO for the DoE (Townley et al. 1997) concluded that the hydrology of the habitat swamps in both Nature Reserves appears to be dominated by a balance between rainfall, surface inflows and outflows, and evaporation.

It is understood that the swamps at Twin Swamps probably fill in response to the first winter rains from direct rainfall and surface water runoff. Late in the winter, the regional water table will rise until the swamps are fed by groundwater. It is suggested that the rise in the water table near Twin Swamps may be at least partly due to flow from the east, from the Darling Scarp

Development or land use changes that may reduce the quantity of water reaching the swamps will be detrimental to the survival of young tortoises and breeding adults.

(EPA 2005:4.5)

The use of the words "not well understood" "appear to be dominated by", "It is understood", "it is suggested that" and "Development or land use changes that may reduce the quantity of water reaching the swamps" emphasise this uncertainty.

After considerable consultation and many re-writes, the second draft of the EPP was released in 2001 (EPA 2001). It stepped back from being a land use control policy and instead required the following:

- Land owners manage their land consistent with the objectives of the EPP (ways of management unspecified); and
- Decision makers (e.g. WAPC and the local government) make decisions consistent with the objectives of the EPP (again the nature of any land use controls was unspecified).

This is a significant change in the content of the EPP. The EPP was finalised in 2003 (Government of WA 2003) with only editorial changes from the second draft, and it effectively delegates decisions on land use controls from the EPP to the land use planning agencies. These agencies are now able to make land use planning decisions as they see fit, subject to those decisions meeting the objectives of the EPP. The EPA produced a Guidance Statement for the Protection of the Western Swamp Tortoise Habitat as advice to decision makers (EPA 2005), to give greater guidance as to how the EPP objectives could be met through the land use planning process.

This modified approach is a more cooperative environmental management regime involving all key decision making agencies — although the cooperation of land owners was not as actively sought and, therefore, not achieved. It is also a more flexible approach enabling relevant agencies to develop responses that are appropriate to their own decision making processes, including case-by-case decision making, provided consistency with the EPP could be demonstrated. One of the key issues was the minimum lot size allowed for future subdivisions. Following consultation with the WAPC and the local government, an eight hectare minimum lot size was agreed upon and included in the Guidance Statement, but not in the EPP.

Policy making approach

The broad policy making approach proposed for the first draft of the EPP, where controls were to be set on land use for private land in the catchments without the use of any incentives to change land owner behaviour, is typical of a traditional expert-driven approach. This conclusion is further supported when the participative process adopted by the EPA to produce the EPP is considered: it was an expert-based approach where a first draft was developed and released for public comment, and the distance between the public and policy makers referred to in Chapter 2 is significant. As noted earlier, this level of participation is consistent with IAP2's Consult level.

The final EPP is less prescriptive and was arrived out with a more consultative, cooperative approach. It is clearly a softening of the traditional expert-driven approach adopted in the original EPP, as acknowledged by the then Minister in reply to a question in State Parliament just after the policy's final gazettal:

The recently gazetted Environmental Protection (Western Swamp Tortoise Habitat) Policy 2002 uses an ecosystem management approach to protect the habitats of the Western Swamp Tortoise. This approach is implemented by policies, protocols and best management practices and, where appropriate is made adaptable by monitoring and research. The Department of Environmental Protection, other public authorities and landowners are required to make decisions and take actions which are consistent with the Environmental Protection (Western Swamp Tortoise Habitat) Policy 2002. A 'command and control' method is not part of the EPP.

(Edwards 2002:7116)

Whilst it was acknowledged that the final EPP attempts to be more cooperative by delegating decision making to the key agencies that actually control land uses (the WAPC and the local government), it is difficult to argue that it is actually a collaborative approach, for two reasons. First, the cooperation sought by the EPA was limited to the key agency decision makers, the City of Swan and the WAPC, with minimal cooperation gained from one of the key stakeholder groups, the landowners. Second, the level of participation can still be considered to be at the IAP2's Consult level where the views of stakeholders were considered but the decision making remained with the EPA who determined the form and content of final policy. The distance between the public and policy remains. The key agencies were consulted as part of the policy making, and in the end their views were accommodated. To a limited extent decision making was shared but only to the extent that the land use controls were removed from the EPP. This left the City of Swan and the WAPC to make these decisions, provided they were consistent with the objectives of the EPP, but it was clearly a very limited decision sharing exercise. The approach of the final EPP is best summarised as expert-based policy making, using voluntary mechanisms to ensure the key decision making agencies comply with the objectives of the policy. This is more typical of the ecological modern policy making approach rather than a traditional expert-driven one.

Policy making evaluation

The main data collection period for this study covered the time prior to the release of the second draft, and so only the policy making of the first draft will be the subject of detailed evaluation here, although some preliminary observations of the policy making of the final EPP will be made. Policy-making performance will be determined using the criterion downstream decision making is consistent with policy, because the policy is draft, is complex and has a long policy implementation timeframe. In this case, policy making of the draft EPP can be considered unsuccessful on this criterion because the key decision makers — the WAPC and the affected local government — refused to initiate policies consistent with the draft EPP. This was largely because of their strong opposition to the draft policy. New development proposals were either put on hold or referred directly to the EPA.

In relation to the political support criterion, policy making of the draft EPP can be considered unsuccessful for two reasons. Firstly, it took nine years for the EPP to be finalised and even then, only after a significant re-write of its contents. As one interviewee noted:

The tortoise one of course has not yet really progressed over the last five or ten years because of an array of difficulties there.

Secondly, the draft EPP received considerable opposition from stakeholders, mostly landowners, although the conservation movement supported the traditional expert-driven approach in the draft EPP. The interviewees did not have a clear view about the draft policy's success — Table 10 shows only two interviewees who expressed a view that it failed and one that it was successful.

For the content relevance criterion, whilst the broad content of the draft policy can be considered appropriate, given that it addresses a significant environmental issue (the remaining habitats of a critically endangered species), it is considered that policy making of the draft EPP was unsuccessful on this criterion because the draft EPP required a significant re-write before a final EPP could be agreed to, involving a significant change in the policy mechanism to be used. On the final criterion, other socio-economic impacts, policy making of the draft EPP can be considered unsuccessful in that it would likely have impacted adversely on private land owners without providing compensation, had it been finalised in this form.

To sum up, whilst the 1994 draft EPP covered an environmental issue in urgent need of attention, on the content relevance criterion policy making of the draft EPP is considered unsuccessful. It was found that it did not succeed on policy-making performance because key decision making agencies did not change their decision making, consistent with the draft policy. Further, it lacked political support and would likely have negative socio-economic effects if implemented. Consequently, on all four criteria, the policy making of the draft EPP is considered to be unsuccessful.

Turning to the final EPP, it is worth noting that on the criterion downstream decision making is consistent with the policy some progress has been made, and policy making of the final EPP could be considered to be successful. The City of Swan (the affected local government) initiated an amendment to its Town Planning Scheme in 2003 for an area of land within the EPP boundary. The amendment sought to include text requiring that

Due consideration is given to the Environmental Protection (Western Swamp Tortoise Habitat) Policy Approval Order 2002.

(City of Swan 2005)

The proposed Scheme amendment was referred to the EPA and there followed a period of negotiation, following which the City agreed to insert additional land use controls into the Scheme to ensure better protection for the two habitats of the Western Swamp Tortoise, including the eight hectare minimum lot size for new subdivisions. The amendment has now

been finalised with support from both the EPA and the WAPC. This indicates that downstream decision making will be made consistent with the EPP, demonstrating that the EPP has some level of political support and would be successful on the policy-making performance criterion. On the other two criteria — content relevance and other socio-economic impacts — and the broad issue of political support it is too early to make an assessment, but concerns from land owners remain, as can be seen from the minutes of a Council meeting. As officers of the City of Swan noted in their report to Council on the Town Planning Scheme Amendment referred to earlier:

This raised significant concerns and anger at the time amongst many affected land owners as the final form of the rezoning amendment not only eliminated any subdivision potential but curtailed permissible rural uses. This decision consequently gave rise to a number of issues, specifically requests for compensation as well as numerous requests for non-conforming uses for cattle and other stock. The City has since issued a number of non-conforming use rights to land owners in the area who have been able to satisfactorily provide the necessary documentary evidence.

(City of Swan 2005:5)

Similarly, as one interviewee noted:

The Western Swamp Tortoise EPP ... I think we are about to have the policy published but there's still a hell of a lot of pain and agony about land use within that area, so I don't think it has worked too well.

Linking policy making approach, policy making evaluation and nature and extent of the conflict

The three themes of conflict are in evidence with the draft EPP. First, there are a range of different stakeholders holding different values for the area, including:

- Land owners in the catchment have an economic interest in the use of their land and opposed the draft EPP;
- The conservation movement has an interest in the protection of the Western Swamp Tortoise and supported the draft EPP;
- The two land use planning agencies saw the draft EPP as being inconsistent with their land use planning objectives for the area and opposed it; and
- The DEC, the manager of the two remaining habitats of the Western Swamp Tortoise had an interest similar to the conservation movement and supported the draft EPP.

Differences between the policy makers and land owners are particularly noticeable. As one interviewee noted:

... it is very hard for an EPP to force land use changes, particularly where the land uses changes that are trying to be implemented, and this is probably more so for Western Swamp Tortoise ..., are not supported by private land owners. Forcing land use changes and conservation on private land is really hard.

Second, the differences between the government agencies that emerged during the policy making process (EPA, WAPC, DEC and the affected local government) suggest conflict over governance. One interviewee noted the interagency problems and was critical of both the EPA and the State Government for not standing firm in the face of this opposition –

... they just didn't have the guts to actually finalise that EPP when it came down to it.

Finally, the science that is in support of the policy was clearly uncertain and highly contested, as already discussed. There is also a resource scarcity issue here, given the critically endangered status of the tortoise, and that there are only two remaining natural habitats.

Consistent with the hypothesis of this thesis, the nature and extent of the conflict here presents a compelling case for the use of the adaptive–collaborative policy making approach. However, as noted earlier, the broad policy making approach proposed for the first draft of the EPP was traditional expert–driven. It is not surprising, therefore, that the policy making of the draft EPP was found by the evaluation here to have failed overall. This supports the case made in this thesis that a traditional expert–driven approach would likely fail in highly contested contexts.

The approach adopted in the final EPP was an ecological modern one, and whilst this approach has a greater likelihood of success than the original traditional expert–driven approach given the nature and extent of conflict here, it is still likely to be unsuccessful in the end. It is, however, noted that on the criterion downstream decision making is consistent with policy some progress has been made, and there is at least some support for the EPP at agency level.

Kalgoorlie air quality EPPs (1988 and 1992)

Policy description and background

The Kalgoorlie air quality EPPs were aimed at controlling sulphur dioxide (SO₂) emissions in the local area by setting mandatory air quality criteria. Up until 1988 there was no control over SO₂ emissions, with concentrations of SO₂ two to four times above recognised standards in residential areas. This was in part due to the close proximity of the mining activity and processing to Kalgoorlie (see Plate 2).

The first EPP for the Goldfields area was introduced in 1988, but was limited in both its scope and geographic extent. It set some broad objectives for air quality and required that industry control emissions and monitor air quality to meet those objectives. Industry could

not meet those objectives with the current operations. Whilst the 1988 EPP receive some initial opposition from the mining industry, it agreed to improve its roasting methods (the main sources of SO₂ emissions), eventually closing down the three operating roasters to be replaced by a single roaster with SO₂ scrubbing technology (EPA 1999). There was also considerable support in the broader community to clean up air quality in the area.

Plate 2: An aerial photograph of Kalgoorlie showing the proximity of mining and processing to the town site (Source: Garry Middle).



This original EPP was reviewed in the early 1990s and was replaced with a revised EPP in 1992, and associated Regulations. This new EPP set more stringent air quality objectives in the form of a prescribed SO₂ concentration limit — never to be exceeded (0.5 parts per million (ppm), one hour average) — and a prescribed SO₂ concentration standard — can be exceeded but only for a prescribed number of times — in this case no more than 8 times a year (0.25 ppm, one hour average). It also expanded the extent of the EPP beyond the Kalgoorlie town site to include the nearby Boulder town-site, the towns of Coolgardie and Kambalda East, 30 and 40 kms from Kalgoorlie respectively, and the Aboriginal Mission at Kurrawang 15 kms west of Kalgoorlie.

The EPP, whilst setting air quality standards to be met, did not prescribe the technology that should be applied to reach those standards. The criteria were to be met by controlling SO₂ emissions through the licensing of the SO₂-producing industries, and subsequent monitoring of air quality to ensure set emission rates were leading to the desired air quality. Licences are issued under the *Environmental Protection Act 1986*, by DEC. SO₂ air quality

monitoring is a well understood science and the results of the monitoring and conclusions about compliance with the standard set in the EPP are largely uncontested. The monitoring has been used at least once to successfully prosecute one of the mining companies for breaching air quality standards in 1996 (Department of Environmental Protection, Water and Rivers Commission, and Resources 2002:81).

The EPP underwent further review in 2003. Both reviews proceeded with minimal controversy and were completed quickly — it took less than 12 months to review the 1988 EPP and produce the final 1992 EPP.

Policy making approach

The policy making approach adopted for both policies is clearly a traditional expert-driven approach, where specific air quality standards are set and industries are licensed and regulated to ensure compliance. The level of participation for both policies is typically at the IAP2 (2007) Consult level where a draft EPP was developed and was subject to public comment from the key stakeholders, mostly industry, although the EPA did seek initial comments from members of the public through the drafting and review processes. The EPA determined the final EPP following its review of submissions on the draft with minimal external input, and the distance between the public and policy makers referred to in Chapter 2 was significant.

Policy making evaluation

There is enough data available to evaluate policy making for both the 1988 and 1992 EPPs. Given the nature of these policies — they and final EPPs and are relatively simple with a limited scope and simple implementation measures — evidence of quantitative environmental improvement consistent with the policy objectives will be used to determine success on the policy-making performance criterion. The EPA noted that that since 1993, the standard set in the 1988 EPP had been met (i.e. there were fewer than nine exceedances of the 0.25 ppm per year) (EPA 1999). The 1992 EPP was, therefore, effective in achieving its objectives. The SO₂ criteria set in the 1992 EPP have also been met (State of the Environment Reporting Unit 1998:45; EPA 2007:42).

On the second criterion (Political Support) both EPPs were able to be finalised relatively quickly and had the support of the key stakeholders. This stakeholder support is demonstrated by the willingness of industry to upgrade air emission technologies. The interviewees also had a consistent view that the policies were successful, as Table 10 shows, with 4 interviewees expressing a view that they had been successful. Most of those who did not comment on the EPPs were unfamiliar with them.

On the third criterion (Content relevance) the EPPs address a significant environmental issue — the key pollutant for the region — and the content and mechanism proposed are supported, as reflected in the following two comments:

... because they are precise and directed.

... it succeeded because ... it highlighted the importance of the issue and it also offered a way of setting up a programme to require companies to comply ... I don't think the EPP itself set standards which were as tight as they should be, so in that sense it was relatively minor. But it set a way forward where we can deal with industry as a model, but we could do it better.

On the final criterion (Other socio-economic impacts) the action of industry to invest in new emission control technology could be considered a significant economic impost, but in the end industry accepted this as part of doing business. There were, however, two positive socio-economic outcomes of the EPPs. First, the captured SO₂ was used to produce sulphuric acid, which is a significant raw material for gold processing. This provided an economic benefit that wouldn't have occurred without the EPP requiring controls on SO₂ emissions. Second, prior to the EPPs coming into force, air quality in the area was consistently at concentrations well above what is considered to be acceptable for human health (see Figure 4 below showing air quality at the public hospital in Kalgoorlie). Air quality has significantly improved since that time, meaning that the general health of the community would likely have improved. One interviewee summed up this socio-economic issue succinctly:

One of the great attributes of the Goldfields one was that it caused investment in pollution control technology like the sulphuric acid plant, so that you actually ended up with a whole set of benefits, not just better air quality, but also a new resource – sulphuric acid – which was commercially viable co-incidentally while you had all the nickel processing.

To sum up, both versions of the EPP had appropriate contents, were effective in attaining their objectives, had political support, had some significant socio-economic benefits and the negative socio-economic impact of increased processing costs for industry were readily accepted. Policy making of both EPPs, therefore, can be considered to be successful on all four criteria.

Figure 4: Changes to air quality in Kalgoorlie from 1993 to 1998 as measured at Kalgoorlie hospital (Source: State of the Environment Reporting Unit 1998).

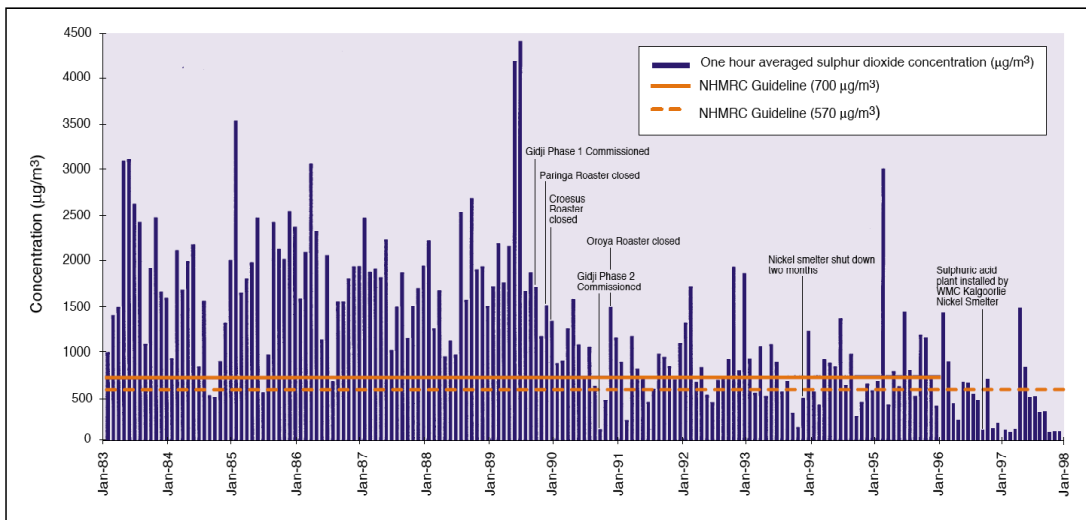


Figure 14. Maximum average hourly sulphur dioxide levels at Kalgoorlie Hospital with significant events resulting in changes to the ambient sulphur dioxide concentration (Source: Department of Environmental Protection).

Linking policy making approach, policy making evaluation and nature and extent of the conflict

There is little evidence of significant conflict associated with these two EPPs. The values of the community in relation to the EPPs were in support of improved air quality, and the industry changed its practices in response to, and consistent with, this community value. There is little evidence of any conflict around the governance of policy implementation, the licensing of industry, notwithstanding the one prosecution mentioned earlier. As one interviewee noted:

... [The EPP] was the first one where we actually required companies to turn off [production of SO₂]. And that's heavy duty.

There is also little conflict over the science in support of the policy, as the science is well understood and generally uncontested. As two interviewees noted of this EPP

I didn't have the same problems with the air quality [EPPs] because they were based on clear science.

... because they were based on clear science and lines on the map.

This low level of conflict suggests that the traditional expert-driven approach applied in both policies is appropriate, and, as discussed above, both policy making exercises were shown to be successful on all criteria.

Ozone EPPs (1989 and 1992)

Policy description

These EPPs were aimed at controlling the servicing of equipment that uses ozone-depleting substance like CFCs to prevent their release into the atmosphere. Implementation of the policies is through Regulations under the *Environmental Protection Act 1986*, but with the cooperation of the industry and industry groups through joint inspections from the DEC and industry. Training courses were also organised in the initial implementation stages, and disposal points for ozone-depleting substances were established. The EPPs are highly prescriptive: for example, they contained clauses covering:

- Sale of ozone-depleting substances to an unauthorised purchaser is prohibited;
- Specific authorisation is required for both individuals and businesses to purchase ozone-depleting substances or alternative refrigerants;
- A requirement for accurate record keeping in relation to the sale and purchase of ozone-depleting substances;
- Specific restrictions on activities involving ozone-depleting substances; and
- A presumption against the discharge of an ozone-depleting substance into the environment.

Analysis of the submissions on the most recent review of the EPP revealed that most supported the 1993 EPP but sought minor changes to wording and scope. One company expressed the view that regulation of the industry was no longer required, but this was not supported by the industry groups. This broad support was reflected in the speed in which the Minister gave final approval to it following her own consultations (i.e. three months). As described in detail in Appendix 3, the science in support of the EPPs is, for the most part, uncontested, as evidenced by the international consensus over the 1992 Montreal Protocol, where 80 nations agreed to a 100% reduction of CFCs by 2000.

Policy making approach

The policy making approach adopted for both EPPs with its high level of prescriptions to control and regulate activities associated with ozone-depleting substances is clearly a traditional expert-driven approach but with significant cooperation from industry — although decision making was centralised in the policy making agencies. The level of participation was clearly at the IAP2's Consult level where the views of stakeholders were considered but the decision making remained with the EPA who determined the form and content of final policy. The distance between the public and policy makers referred to in Chapter 2 was significant.

Policy making evaluation

There are enough data available to evaluate the policy making of both the 1988 and 1993 EPPs.

Given the nature of these policies — they have been finalised and are relatively simple with a limited scope and simple implementation measures — quantitative environmental improvement consistent with the policy objectives will be used to determine policy-making performance. As noted by the EPA (Chapter 4), both EPPs met their environmental objectives, although the 1988 EPP was significantly out-of-date at the time of review.

On the second criterion (political support) both EPPs were able to be finalised relatively quickly and had the support of the key stakeholders; in particular, the affected industries cooperated as part of the implementation stages of the policy. There was no clear view expressed by the interviewees about the policies' success, with Table 10 showing only 1 interviewee expressing a view one way or the other, and that view was that they had been successful.

The content of the policies is appropriate ('content relevance' criterion), given that they target the key ozone-depleting substances, and the contents of the draft EPPs and mechanisms proposed went largely uncontested, with only minor changes made to the drafts. On the final criterion (other socio-economic impacts), industry was required to find alternatives to these ozone-depleting substances but it seemed to accept this as part of doing business. The actual economic cost of phasing out the use of these substances was minimal, as there were relatively cheap alternatives available that were just as effective (for example aerosol propellants).

To sum up, both of the EPPs had appropriate content, they were effective in attaining their objectives, each had political support and any negative socio-economic effects of each EPP were minimal and readily accepted by industry. Policy making of both EPPs can, therefore, be considered to be successful on all four criteria.

Linking policy making approach, policy making evaluation and nature and extent of the conflict

There is little evidence of conflict associated with the policy making of these EPPs. The view that CFCs were causing environmental problems and needed to be replaced had general acceptance throughout the community. This alignment of values within the community was based to a large extent on the science about the impact of these chemicals not being in dispute. Finally, there was a single agency responsible for the control and management of these substances, which reduced significantly the risk that interagency conflict would emerge. As one interviewee noted:

Ozone involves a simple regulation, we know all those who use it, we bring in a law, we get them on–side so they understand what it is, there’s a known substitute, dealt with in probably a matter of minutes.

This low level of conflict suggests that the traditional expert–driven policy making approach applied in the EPPs would be successful, and, as discussed above, success was shown to have occurred.

Kwinana air quality EPPs (1992 and 1999)

Policy description and background

Kwinana is WA’s most important heavy industrial area (producing goods worth in excess of \$6 billion a year) and is located on the eastern shore of Cockburn Sound, some 20km south of Perth’s CBD. It was established in the 1950s and there are now residential areas directly abutting the industrial area to the south and east (see Plate 3.). Air quality in these residential areas emerged as a problem in the 1970s when the number of new heavy industries in Kwinana increased significantly.

Plate 3: The view from the beachside café strip at Rockingham (the main residential area to the south of Kwinana) showing the proximity of the Kwinana industrial area (Source: Garry Middle).



These EPPs were aimed at controlling SO₂ and dust emissions in the Kwinana area by setting mandatory air quality criteria. SO₂ is the more significant of these two emissions. The 1992 EPP had two key components, with the first part establishing three geographical areas around and including the industrial area, which were to have different air quality criteria targets. These were:

- The industrial area, where air quality could be below that set for residential areas;
- A buffer, non industrial area directly surrounding the industrial area where air quality could be below that set for residential areas but better than in the industrial area; and
- Outside the buffer area where air quality would be that set for residential areas.

The second part of the EPP involved setting up an air quality monitoring program, which was to be funded and managed by industry.

The Kwinana EPP had two significant differences from the Goldfields EPP. First, The Goldfields EPP only dealt with SO₂, whereas the Kwinana EPP also included dust. Second, the criteria in the Kwinana EPP were more stringent than the Goldfields EPP. Table 11 below compares the SO₂ criteria of the two EPPs.

Table 11: A comparison of the SO₂ criteria for residential areas for the Kwinana and Goldfields EPPs.

EPP	Standard (ppm) – desirable air quality	Limit (ppm) – never to be exceeded	Averaging period	No of yearly exceedances of standard
1992 Kwinana	0.125	0.25	1 hour	Not specified
1992 Goldfields	0.25	0.50	1 hour	8
2003 Goldfields	0.20	0.25	1 hour	1

As with the Goldfields EPP, these criteria were to be met by controlling SO₂ emissions through the licences of the SO₂ producing industries, and subsequent monitoring of air quality to ensure set emission rates were leading to the desired air quality. The Kwinana EPP was, and is, supported by air quality modelling which has been progressively developed and fine-tuned. The model allows the DEC (the regulator of the industry) to adjust total emission rates of industry to ensure compliance with the EPP (i.e. the buffer is maintained). In practice, most industries discharged SO₂ at rates well below those prescribed in their licences. Industry also has considerable input into reviewing emission limits so as to comply with the EPPs. Through the peak industry body at Kwinana, the Kwinana Industries Council, a particular industry can propose a change in its allowed

emission rate, have that modelled for impact and then apply for a change through its licence. Further, in setting up the 1992 EPP, the EPA came to an agreement with industry that existing industries could emit SO₂ to the full extent of the EPP, provided that when a new industry came along, existing industries would have to reduce emissions to accommodate that new industry (EPA 1993). This is a *de facto* emissions trading system. As one policy maker noted:

It set the total parameters and said within that you can trade. It effectively set up an informal trading system which said “you, industry, can sort out and negotiate whatever outcomes you want to generate benefits for you collectively, but this is the limit, and thou shalt not go above the limit.

Industry is responsible for the monitoring of air quality, and reporting those results to the DEC, although the DEC carries out its own monitoring that acts as a check on the industry monitoring. Industry has been very supportive of the 1992 EPP, as has been most of the community. As noted by one interviewee:

... because I think there has probably been strong community support for it, a strong political will to have something happen.

Notwithstanding that support, community pressure has grown for change, as discussed below, which is reflected in the review of the 1992 EPP.

The implementation of the 1992 EPP began to raise significant land use planning issues, notably the presence of residences in the buffer area and the constraints this placed on industry to ensure these residents were not exposed to unacceptable air quality. In addition, there was growing community concern about the possible impacts from industry in Kwinana of other contaminants. A review of the public submissions made to the EPA in 2001 on a proposed new iron ore smelting plant at Kwinana revealed that concerns were being expressed about levels of Dioxins, furans, poly aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), persistent organic pollutants (POPs), and heavy metals in the air. These concerns were raised by the two neighbouring local governments and the peak community and environmental groups⁷.

In response, the EPA noted:

A number of the submissions to the EPA ... expressed concerns about potential health impacts on the community from cumulative air emissions from Kwinana industries.

(EPA 2002:vi)

Clearly, the community began to see the management of air quality in Kwinana as much broader and complex than concerns just about SO₂ and dust. In the late 1990s, the 1992

⁷ These groups are the Community Networking Inc, Conservation Council of Western Australia Inc, Hope Valley Progress Association, Pollution Action Network, Kwinana Progress Association Inc and Kwinana Watchdog Group.

EPP was reviewed by the EPA. In its review, the EPA noted that air quality in all three of the areas was well below the criteria set in the EPP. In fact, the air quality in the eastern part of the buffer area achieved standards suitable for residential areas (outside the buffer). This was no accident, as there were two small town sites and many rural properties within that part of the buffer. In effect, the 1992 was effective in achieving its objectives and performed better than was required. The EPA went on to conclude that the content of the 1992 EPP was still relevant and not in need for change. As a result, the 1992 EPP was simply rolled over into the 1999 EPP, which effectively put on hold community concerns about the emissions other than SO₂ and dust.

The EPA was of the view that it was the role of the WAPC to address the concerns about incompatible land uses in the buffer area, and it worked with the WAPC to develop a cooperative approach to addressing these land use planning issues. The WAPC ultimately acknowledged it was the lead agency on this issue, and, in response, it developed the Fremantle Rockingham Industrial Area Regional Strategy (FRIARS) study (WAPC 2000), which had as two of its objectives to:

- Resolve current land use conflicts between residential and industrial uses; and
- Maintain the Kwinana Environmental Protection Policy (EPP) buffer policy.

Two of the key outcomes of FRIARS were that the existing residential areas within the buffer were to be re-zoned to general industry and the government was to facilitate an immediate and rapid purchase of those residential properties in the buffer area. This was facilitated by the *Hope Valley–Wattleup Redevelopment Act 2000* that, amongst other things, gave the authority to a specially established government authority to acquire properties in the buffer area compulsorily, thus removing residents from the buffer. This cooperative approach was taken a step further when the WAPC lead the review EPP, and the review included consideration of the appropriateness of the buffer and should it be extended in some areas (WAPC 2002). The WAPC review concluded that:

The Review has identified the need to acknowledge that the Kwinana EPP buffer area is affected by not only sulphur dioxide emissions as identified by the DEP but also various other land uses, constraints and their buffers (including waste water treatment plants, basic raw materials areas, landfill sites, various infrastructure). This review therefore establishes principles and a process for redefining the buffer and recommends a new composite buffer to be called the Residential Exclusion Area (REA). The REA is designed to protect residents from emissions from the industrial and ancillary land uses in the area and also to protect industry from encroaching residential development, which may threaten their operations.

(WAPC 2002:16)

The EPP remains unchanged from its 1999 rolling over.

Policy making approaches

The key aspects of the policy making approaches are as follows:

- The EPPs are prescriptive in that they set air quality limits for three clearly defined geographic areas;
- Their implementation involves a strong role for industry in managing the EPPs;
- Successful implementation relies on industry working cooperatively with the regulator (DEC); and
- A *de facto* emissions trading system has been established.

The participation for both policies was quite extensive where draft EPPs were developed by the EPA for comment, but there were on-going discussions with key stakeholders, in particular industry, for many years prior to the release of the first draft of the EPP on how air quality in Kwinana was to be managed. For example, the buffer area was first proposed in 1982 (DEC 1982) and remains largely unchanged today, and calls for environmental policy to address air quality in the area dated back to 1988 (KICC 1988). The stakeholders consulted for the 1992 draft were typically the corporatist groups, mostly industry, but there was considerably more interest from community groups (non-corporate) for the 1999 draft EPP, as discussed above. In finalising the EPPs, the EPA considered the views of stakeholders but the decision making remained with the EPA, who determined the form and content of the final policy. The distance between the public and policy makers referred to in Chapter 2 exists here, but the on-going discussions with key stakeholders over many years prior to and during the EPP policy making process and the high level cooperation with industry in the implementation of the EPPs, suggest that the level of participation is at IAP2's "Involve" level.

This suggests that the policy making approach adopted for both the EPPs is ecological modern, using regulatory command and control tools to facilitate a free market approach to emissions control. Whilst there is evidence of cooperation, it has been at the implementation level with no delegation of decision making of the EPP itself, either actual or implied.

Policy making evaluation

There are enough data available to evaluate the policy making of both the 1992 and 1999 EPPs.

Looking first at the 1992 EPP, given its nature — it has been finalised and it is relatively simple with a limited scope and simple implementation measures — quantitative environmental improvement consistent with the policy objectives will be used to determine policy-making performance. As noted by the EPA, the air quality criteria set in the 1992

EPP were achieved during the implementation of the policy: i.e. the environmental objectives were met. This view was also reflected in the interviews, for example:

... but in terms of improving air quality, when you look at what we had in the late 80's or the early 80's to what we have now the policy has been tremendously successful.

On the second criterion (political support) the 1992 EPP was able to be finalised relatively quickly and had the support of the key stakeholders, although some submissions made during the review did raise some significant concerns. These concerns, however, are about what the 1999 EPP should cover. The interviewees expressed a clear view that the EPP has been successful, with Table 10 showing it has a highest degree of support: nine interviewees expressed the view that it had been successful. As one interviewee noted:

... the Kwinana Air policy, I would have thought that that's been a fairly successful one, because I think there has probably been strong community support for it and strong political will to have something happen.

Another reason why the EPP gained political support was its limited geographic extent. As one interviewee noted:

It's a policy which only affects a relatively limited number of proponents, the people inside the area and they've accepted it.

The content of the policy is appropriate (content relevance) for the time, although concerns were raised about the contents of the 1999 EPP (see below). The contents of the draft EPP went largely uncontested, as did the mechanisms proposed in the EPP. As one interviewee noted of the EPP:

... (it) works by itself. The industry negotiates, so really that's a relatively easy way for governments to manage things.

On the final criterion, other socio-economic impacts, some issues have been raised about land uses within the buffer and the constraints on industry, but, again, these more strongly relate to the 1999 EPP. There have also been some additional benefits for those living near Kwinana as the EPP, whilst it was originally intended to only control SO₂ and dust, the EPP was also used as a *de facto* control over both noise and risk levels by using the air quality buffer as the buffer for these impacts as well. As one interviewee noted:

It was written for SO₂ but the arbitrary boundary works for noise and all sorts of things as well.

To sum up, the 1992 EPP had an appropriate content, was effective in attaining its objectives, had political support, there were some demonstrated socio-economic benefits and whilst some concerns about negative socio-economic impacts were raised during the implementation period, these were more relevant to the 1999 EPP. Policy making of the 1992 EPP can be considered to be successful on all four criteria.

Turning to the policy making of the 1999 EPP, as noted by the EPA, the air quality criteria are being achieved at Kwinana: i.e. the environmental objectives were met.

Notwithstanding this, there are some concerns about the contents of the EPP raised during the review period. As noted earlier, this EPP is currently undergoing further review, led by the WAPC. This review accepted that the 1992 SO₂ and dust air quality criteria should apply to the revised policy, but noted that the 1992 policy scope was too narrow and control of other contaminants should also be included. Several interviewees supported the broadening of the EPP, for example, one interviewee noted:

There are questions being raised with regard to cancer levels in the Kwinana–Rockingham localities as a result of industries, and that sort of thing. And you're getting the situation, where we're assessing a new proposal where six to nine months ago I would have thought that that would have been a reasonably straight forward project, it's now getting a great deal of focus because of people's sensitivity and concern regarding emissions.

In addition, the WAPC review recommended that the buffer boundary needed to be revised in some locations. Put another way, the 1999 EPPs content needs revision, which means that the policy making of the 1999 EPP can be considered unsuccessful on the content relevance criterion.

Another significant concern was raised in the review relating to unintended socio–economic impacts of the 1999 EPP, in particular, the existence of houses in the buffer area. This constraint means that industry is required to control its emissions so that acceptable air quality is experienced at the nearest residence rather than the edge of the buffer boundary, which means much tighter restrictions on air emissions than is actually required to comply with the EPP. As already noted, the process of relocating these residents is well underway although not fully complete at the time of writing of this thesis.

To sum up, the 1999 EPP needs a significant review of its content, was effective in attaining its limited objectives, lacked political support and the negative socio–economic effects that emerged during the implementation period of the 1992 EPP are now significant. Policy making of the 1999 EPP can, therefore, be considered to be successful on the policy–making performance criterion, but unsuccessful on political support, content relevance and other socio–economic criteria.

Linking policy making approach, policy making evaluation and nature and extent of the conflict

The nature and extent of conflict associated with the policy making of the 1992 EPP was limited, but was more significant for the 1999 EPP. The values of both the community and the regulator were aligned with the 1992 EPP in that both were seeking statutory control over air quality, and industry accepted the need for tighter regulation albeit reluctantly. As one interviewee noted:

... the people inside the area (industry) and they've accepted it, whether they like it is another matter, but they've accepted it, they work with it and it manages the situation

There was considerable dispute surrounding the values associated with the 1999 EPP, with the community and conservation groups wanting a more broadly-scoped EPP covering more contaminants, whereas the policy makers proposed to keep the scope to SO₂ and dust. Industry supported the retention of the narrow scope for the EPP. As well, many residents within the buffer area wanted to remain, whereas industry and the regulators had a view that all residents within the buffer area had to be removed.

There was, however, little dispute over the science in support of the 1992 EPP. As one interviewee noted:

The fact that you've got the EPP regime in place and it is really well backed by science, it has actually led to the sort of strategic decisions by industry and others.

This was largely because of the limited scope of the 1992 EPP to SO₂ and dust. The science and understanding of the impacts of these substances are relatively well understood and uncontested⁸. This changed significantly for the policy making of the 1999 EPP where concern was raised about a wider range of contaminants, and the science for many of these is not well understood. This conflict has yet to be played out as the EPA has not chosen to include additional contaminants in the 1999 EPP.

Governance of the 1992 EPP was relatively uncontested as it really only affected one agency, the DEC, and its licensing of industry. However, the land use implications of the EPP emerged as a significant issue by the time the 1999 EPP was released, as already noted. It was only when the EPA decided to work with the WAPC to deal with the land use planning issues that the conflict between the agencies reduced significantly. Up until that time, the EPA effectively controlled land use within the buffer and made it clear that it would not support further residential development within the buffer, which led to the EPA using EIA to block any encroachments (EPA 1994). This standoff was resolved when the WAPC accepted the buffer defined in the EPP as the key constraint on land uses in the area when it initiated the FRIARS study in 1996 (ERM Mitchell McCotter 1997). This change is reflected in the following response by two senior WAPC planners interviewed:

The Kwinana EPP actually, whilst it was about SO₂, it actually set the planning requirements. Now, there has been a review of the whole planning now and the planning line will be sort of like the old EPP line, but it certainly won't be an EPP line. It is now a planning line. So it actually moved to set planning things. So, I think it did make a difference.

⁸ It should be noted that there is a growing debate about how dust is dealt with in the EPP. It sets limits on relatively large sized particles (PM₁₀), but there is growing evidence that smaller particles are of concern as well and should be addressed in the EPP (PM_{2.5}).

I think when you look at the way that tried to protect a very complex buffer to a very large industrial area, the biggest in the State, I think is actually quite significant. The outcome has been that the State is now moved through, originating in the late 1980s, an area that obviously has had environmental problems associated with it, and the land use response has been to basically move residential land out of it. It took 10 years to get to that point, with a separate piece of legislation, but the origin was actually the EPP. I think that's been very successful.

So, whilst industry continued to support the EPP as proposed by the EPA, there was some initial conflict with the land use planners, which was finally addressed by the WAPC taking a lead role in addressing the land use conflicts in the buffer area. The relatively low level of conflict associated with the policy making of the 1992 policy suggests that the ecological modern approach is successful, which is consistent with the finding above.

The conflict associated with the policy making of the 1999 EPP suggests that a continuation of this ecological modern approach would not lead to a successful policy outcome, which is also consistent with the evaluation carried out above. In particular, it was not possible to see SO₂ management in isolation from broader planning issues, and there was pressure growing to include other contaminants within the EPP. Arguably, the adoption of a more collaborative approach involving the WAPC increases the possibility of a more successful policy making approach. What is absent from this new approach, however, is significant involvement from the affected communities and community groups so that their concerns regarding contaminants other than SO₂ and dust are included. There is little evidence of this to date, and decision making on the EPP is centralised in three agencies, the EPA, DEC and the WAPC. A truly collaborative approach would involve greater participation from the community and other stakeholders.

The 1992 Lakes EPP and the draft 1999 Wetlands EPP

Policy description and background

The 1992 EPP protects numerous lakes identified in a series of maps associated within a defined area of the Swan Coastal Plain 100km north of Perth to 200km south of Perth (the Swan Coastal Plain is approximately 25–30km wide). The EPP makes it an offence to fill, excavate, mine, discharge effluent into, drain into or drain out of the identified lakes without obtaining an exemption. The EPP includes specified penalties for any unauthorised acts.

Exemptions were generally managed through either EIA by the EPA, or Works Approval by the DEC (through Part V of the *Environment Protection Act 1986*). The policing was largely left to one officer within the DEC who generally responded to case-by-case complaints

about breaches rather than having a program of visiting individual lakes to check for compliance.

A draft EPP was released in 1991 (EPA 1991) and the proposed prohibitions caused many affected land owners to object to both the EPA and the Minister for the Environment about constraints on the use of private land during the drafting of the EPP (Walsh 1998). Notwithstanding these initial concerns, the EPP was finalised in less than 12 months following the release of the draft.

There were some concerns about the process by which wetlands were chosen for protection. As noted in Appendix 3, wetlands (lakes) covered by the policy were selected for inclusion in this policy on the basis that they consisted of areas of standing water of 1 000 square metres or more, as at 1 December 1991 (Government of WA 1992:6100).

Wetlands that have a full or nearly complete coverage of vegetation (swamps) were not protected by this EPP. This was of greatest concern to the conservation movement and was addressed in the 1999 review of the policy (see below). As one interviewee noted:

... (the Lakes EPP) was always dogged a bit by the adequacy of the data, and some of the lakes it was protecting were not significant environmental features.

Plate 4 shows a highly degraded wetland that meets the criteria for protection in the EPP whereas Plate 5 shows a largely undisturbed wetland not protected.

Plate 4: Degraded wetland that meets the criteria for protection in the EPP (Source: Garry Middle).



Plate 5: Largely undisturbed wetland (a CCW) not protected by the EPP (Source: Garry Middle).



A review of the 1992 EPP was begun in 1999 with the release of a proposed new EPP (EPA 1999). The draft revised EPP had three significant changes. First, the definition of wetlands was broadened to include seasonal wetlands and wetlands with full vegetation cover, rather than just lakes or wetlands containing surface water for most of the year, as is the case with the Lakes EPP. Second, environmental value was used as the criterion for inclusion for protection rather than the presence of surface water. So-called conservation category wetlands (CCWs) — generally those wetlands that have minimal disturbance (see Plate 5) — were to be protected. Third, clearing of the native vegetation was added as an additional prohibited activity. These changes were widely supported by the conservation movement which had been calling for these changes for some time, but it also meant that many more wetlands would be protected than under the 1992 EPP, with many more land owners affected.

There was significant opposition to these changes and this was reflected in the submissions received on the draft: of the 664 submission received, 547 (82.4%) were from affected land owners, and their key issues were:

- The policy making process and the (perceived or real) lack of consultation, especially with land owners;
- Threats to freehold property rights;
- The need for compensation or other incentives where a wetland is listed for protection by the EPP; and

- Concerns about how the EPP would affect existing approvals involving wetlands that would be protected by the EPP.

The submission to the EPA by the WA Chamber and Commerce and Industry illustrates some of these concerns:

Notwithstanding the exemption provided in Regulation 8(2), basic property rights must be observed in the case where wetlands are given protection under the proposed EPP. Land owners who have land that they could have reasonably expected to develop under current zoning, but will be prevented from doing so by this instrument, must be compensated at full market value.

(Chamber of Commerce and Industry of Western Australia 2004)

There was also disagreement about the definition of what is environmentally significant and, therefore, what wetlands should be caught up in the EPP. As noted above, all wetlands categorised as CCWs were to be protected by the EPP. The then Waters and Rivers Commission had, by the time the 1999 draft wetlands EPP was released, largely completed a study of mapping, categorising and evaluating the wetlands on the Swan Coastal Plain (Hill et al. 1996). The evaluation part of the study involved categorising wetlands into one of three management categories:

- Conservation category wetlands — these are wetlands considered to be internationally, nationally, State or regionally significant, and other wetlands that have greater than 95% of their area undisturbed;
- Resource enhancement wetlands — wetlands that have between 10% and 94% vegetation cover remaining or are between 10% and 94% undisturbed; and
- Sustainable use–multiuse wetland — the remaining wetlands (highly disturbed).

The inclusion of all CCWs for protection was strongly contested during the review period, especially, and not surprisingly, from groups representing the land development industry and land owners. The chief concerns pertained to the many wetlands not considered internationally, nationally, State or regionally significant, but had greater than 95% of the area undisturbed. As the Urban Development Institute of Australia's (UDIA) submission to the EPA noted:

The proposition that technical criteria which have previously been used to evaluate conservation values of wetlands will now be changed will create significant issues and problems for community and industry...

We are concerned that there is now a new set of criteria proposed, and that these criteria are very broad and potentially will include [on day one when the EPP is gazetted and has legal force] wetlands which whilst having some acknowledged values, are not so significant as to create the need to restrict uses as set out in the EPP...

We submit that before this EPP is finalised and gazetted, the proposed environmental significance criteria are subjected to more public and extended review, including expert peer review by a panel from government, community and industry.

(Urban Development Institute of Australia Western Australian Division Incorporated
2004)

UDIA were seeking a filtering process for these 95% undisturbed wetlands so that their actual environmental values and significance should be considered prior to inclusion.

Another submission from a metropolitan local government picks up the concerns about existing approvals:

The City does, however, have some concerns (about the draft EPP), in particular ... the inclusion of wetlands where planning approval for the surrounding land has already significantly progressed... the register should be altered to reflect the approvals process ... or the wetlands should be removed from the register until after the planning process has been completed.

The concern here is that many of these 95% undisturbed wetlands are in areas already up-zoned and there were existing development expectations and plans for these areas that would likely involve significant disturbance to the wetlands. It was suggested that the EPP exclude these wetlands and not be retrospective in its application.

Debate between the EPA, the Minister and affected stakeholders went on for another five years before a revised draft was released in July 2004 (now called Environment Protection (Swan Coastal Plain Wetlands) Policy). Following a thirteen-week review period, the EPA forwarded a revised version of the revised draft to the Minister for her consideration. The Minister released this revised draft EPP for a further comment period in November 2004.

One of the key issues raised in both the EPA's and Minister's review was, as the Minister noted (Edwards 2005:2), "ongoing concern about perceived unintended impacts on property owners". In order to address this concern, the Minister established an expert review panel to provide advice on the "social, economic and environmental issues associated with the revised draft policy". The panel published its final report in June 2005 and concluded that:

After careful consideration, the Panel has come to the conclusion that to achieve wetland protection, an EPP is a necessary component of a broader package including incentives, land purchase, and education/information. However, the EPP should only be gazetted subject to significant changes, and as one component of the broader required wetland protection package. In this respect, the Panel would be concerned if only some of the following recommendations were to be adopted, as this will not achieve an equitable or satisfactory outcome for wetland protection, the community, and affected landowners.

The Panel understands that the recommendations will have significant implications for resourcing of wetland protection for the Department of Environment. However,

given the high environmental values of wetland systems, and the potentially significant social and economic impacts of protection, adequate resourcing directed to both improved management and purchase of land is required.

(Holthouse, Arnold, and Davis 2005:3)

In other words, the panel had significant concerns about the 2004 revised draft and that the EPP should be part of a wider package to include matters not possible to be covered in the EPP. Two recommendations of the review reflect the concern over the science that supported the EPP:

Recommendation 5: That the methodology and criteria for evaluating CCWs be reviewed and agreed across Government as soon as possible, and that these agreed criteria apply within the EPP. This process should be guided by the Wetland Coordinating Committee in the context of the evaluation framework which is currently being developed.

Recommendation 6: That the criteria for classifying damplands are further developed and specified to give greater scientific clarity to identifying damplands, and that this information is properly communicated to the broader community.

(Holthouse, Arnold, and Davis 2005:3)

Two other recommendations from the panel reflect on-going concerns about the impacts on private land owners:

Recommendation 12: That appropriate planning instruments be put in place to ensure that registered wetlands are incorporated into Planning Strategies, and Region and Local Town Planning Schemes.

Recommendation 13: That a wetlands financial support package, similar to the Bush Forever financial support package, is established. An indicative sum of \$20 m over a five year period is proposed.

(Holthouse, Arnold, and Davis 2005:3)

As noted earlier, this sustained criticism of the EPP lead the Minister to decide not to proceed with it noting that the EPA could apply the principles of the draft policy through its on-going EIA of individual proposals. The EPA subsequently relied on its non-statutory Position Statement on wetlands as its policy position (EPA 2004).

Policy making approach

The policy making approach for both the 1992 EPP and 1999 draft EPP involved highly prescriptive controls on land uses for private land owners with nominated wetlands on their properties without the use of any incentives. The level of participation for the 1992 EPP can be considered to be at the IAP2's (2007) Consult level where a draft EPP was drawn up and was subject to public comment, the views of stakeholders were considered but the decision making remained with the EPA who determined the form and content of final

policy. The distance between the public and policy makers referred to in Chapter 2 is significant, with decision making for the policy agency centred and expert-driven. The level of participation for the 1999 draft EPP is closer to IAP2's (2007) Involve because of the greater number of opportunities for public input, in particular the additional public review required by the Minister and the independent review she set up.

The policy making for both the 1992 EPP and the 1999 draft EPP are, therefore, typically of a traditional expert-driven approach.

Policy making evaluation

The main data collection period for this study was prior to the release of the 2004 draft policy, and so only the policy making of the original 1992 EPP and the proposed 1999 EPP will be the subject of evaluation here. Given the nature of these policies — they are complex with a long time frame for implementation, the implementation mechanism is also complex and the 1999 draft EPP was never finalised — policy-making performance will be determined using downstream decision making is consistent with policy⁹.

In this regard, the policy making of the 1992 policy can be considered to be successful given that both the EPA and the DEC's decision making was carried out during the life of the policy consistent with the EPP. As well, the land use planning agencies — the WAPC and the affected local governments — adjusted their policies to take into account the EPP, and subsequently changed local land use planning in response to case-by-case EPA assessments of proposals affecting EPP lakes. Further, the WAPC planning policy Environment and Natural Resources has a provision that:

Planning strategies, schemes and decision making should ... consider mechanisms to protect, manage, conserve and enhance ... wetlands identified in any relevant Environmental Protection Policy.

(WAPC 2003:2052)

In relation to the political support criterion, the policy making of the 1992 EPP can be considered successful in that it was finalised relatively quickly from a first draft in 1991 to a final gazetted policy in 1992. As one interviewee noted:

There was strong political support to get the Lakes policy up, it was strongly backed by the Conservation Movement at the time.

Table 10 shows that the Lakes EPP also has the second highest degree of support from interviewees. As one interviewee noted:

⁹ This is re-enforced by the EPA concluding that it could not determine the policy's effectiveness and that its content needs considerable revision (see Chapter 4), although, this did not stop at least one interviewee noting that the EPP "probably still did protect a tremendous amount of lakes, under a lot of criticism".

There was strong political support to get the Lakes policy up, it was strongly backed by the Conservation Movement at the time.

The concerns of land owners were noted, they weren't so significant as to prevent either the EPA or the Minister from finalising the EPP relatively quickly.

The content of the 1992 policy ('content relevance') is appropriate even though the Lakes EPP was criticized for not protecting all of the significant wetlands: this criticism was mostly in hindsight as part of the review in 1999. On the final criterion, other socio-economic impacts, any adverse impacts on private land owners were addressed through the EIA process and subsequent land use planning decisions. In summary, the policy making of the 1992 policy can be considered a success on all four criteria.

Turning now to the policy making of the draft 1999 EPP, this policy was strongly opposed by the land use planning agencies, as exemplified by the response from one local government above, and by the fact that the downstream decision makers (the WAPC and local governments) did not recognise the draft EPP but continued to recognise the 1992 EPP.

On the political support criterion, the length of time taken to get to a final decision on the EPP (in 2006) and that the Minister decided not to proceed with the EPP clearly reflects the lack of political support for the draft EPP. Further, the evidence above suggests that the concerns of land owners and the development industry were much greater with the 1999 draft than the 1992 EPP, although it needs to be acknowledged that the 1999 draft EPP did have stronger support from the conservation movement. These land owner concerns were supported by the independent review, which highlighted the likely (socio-economic) impacts on property values and possible restrictions on land uses, should a property have a listed wetland.

A case can be made that the content (content relevance) of the 1999 draft is more appropriate than the 1992 EPP, given the more rigorous definition of wetlands to be covered by the policy and the inclusion of a prohibition on clearing. The debate surrounding the draft EPP was largely supportive of both these changes, but the key issue of debate was the definition of environmental significance and, therefore, which wetlands should be included for protection in the EPP. As well, the failure to address compensation for loss of development opportunities was also a key concern. Overall, therefore, the draft EPP was unsuccessful on this criterion.

In summary, the policy making of the 1999 draft EPP can be considered unsuccessful in that the draft EPP's content was inappropriate, the relevant decision making agencies did not adjust their decision making to be consistent with the draft EPP, it lacked political support and it would likely have negative socio-economic effects had it been implemented.

Linking policy making approach, policy making evaluation and nature and extent of the conflict

The above discussion suggests that conflict associated with the policy making of the 1992 EPP was present but limited, but was much more significant for the policy making of the 1999 draft policy. For both EPPs, conflict was initially over the different wetlands' values between the conservation movement and land owners. The overall acceptance of the 1992 EPP suggests that this conflict, whilst present, was manageable. However, the conflict was significantly greater with the policy making of the 1999 draft policy. Land owners mounted a concerted campaign that ultimately led to the Minister announcing to Parliament on 23 August 2006 that he would not approve the new EPP, and that the 1992 EPP was to stand instead.

As noted above, the definition of wetlands and their significance was an area of conflict with both policies, but particularly evident in the policy making of the 1999 draft where the methodology used to establish a wetland's significance, and thus whether it was listed on the policy, was contested strongly. This conflict can be viewed in two different ways. It could be considered as conflict over the science in support of the draft EPP where the methodology used to establish a wetland's significance was in dispute. It can also be seen as a conflict over values where both the EPA and the conservation movement took a view that all CCWs were worthy of protection whereas land owners, planners and developers were of the view that an additional filter was required to determine significance.

Governance conflict was minimal with the 1992 policy, but the WAPC and affected Local Governments strongly opposed the 1999 draft EPP and the subsequent land use planning decisions that would follow from its implementation.

As noted above, the broad policy making approach of both the 1992 EPP and 1999 draft EPP were traditional expert-driven, and the success of the 1992 EPP and the failure of the 1999 draft EPP, therefore, can be explained by their relative levels of conflict, as discussed above. Interestingly, though, conflict was present with the 1992 EPP, especially over values, and it could have been expected that this alone should have led to policy failure given the traditional expert-driven approach adopted. The fact that the policy making was successful suggests that something else could have been going on. One explanation is the influence of a policy champion who was able to push through the resistance of land owners. As will be seen later in Chapter 6, the presence of a policy champion was identified as a key to successful policy making. In this case, the Chairman of the EPA took a strong and public leadership role in the policy, and, as one interviewee noted:

It's fascinating looking back on the Lakes EPP, it's just a will to get it through, with the personal influence of people like Barry Carbon and others who were going to get it through ... I think it is essential to have policy champions: people who are able to deliver policy and sell policy to all the stakeholders and politicians.

Swan Canning EPP (1998)

Policy description and background

The Swan and Canning Rivers are the main rivers that cross the Perth Metropolitan area, and join to form a large estuary near the Perth CBD. This estuary is the most significant landscape feature of Perth and is significant for its aesthetic, recreational, commercial and environmental values (see Plates 6 and 7). Because of its size and location in the centre of the city, it is the most intensively used river system in WA. The catchment of both rivers is very large (see Figure 5) with most of this area cleared and used for agriculture, mostly broad-acre. As with most rivers set in urban contexts with agriculture being the predominant use in the catchments, they have elevated nutrient levels and other contaminants, and have been subject to increased algal blooms in recent years (Government of WA 2004), with the first significant algal blooms occurring in the summer of 1993/94. The algal bloom and another significant bloom in the summer of 1997/98 lead to the closure of parts of the estuary to recreational activities for a few days, and the bloom in the summer of 2000/01 led to the closure of the whole estuary to recreational activities for 12 days (EPA 2007).

The government established the Swan River Trust (SRT) in 1989 to be the key planning and management agency for the both the Swan and Canning Rivers, although its decision making was limited primarily to in-river proposals such as jetties and foreshore developments. The significance of the estuary and growing pressures on the entire river system led the EPA to begin the process of drawing up an EPP in the early 1990s, with a first draft released in 1995 (EPA 1995), and finalised in 1998. The SRT and DEC worked together to produce the EPP for the EPA. In 2007 the EPP was replaced by the *Swan and Canning Rivers Management Act 2006*. The Act also added further roles and responsibilities to the SRT.

Figure 5: Catchment for the Swan and Canning Rivers (Source: Government of WA 1998).

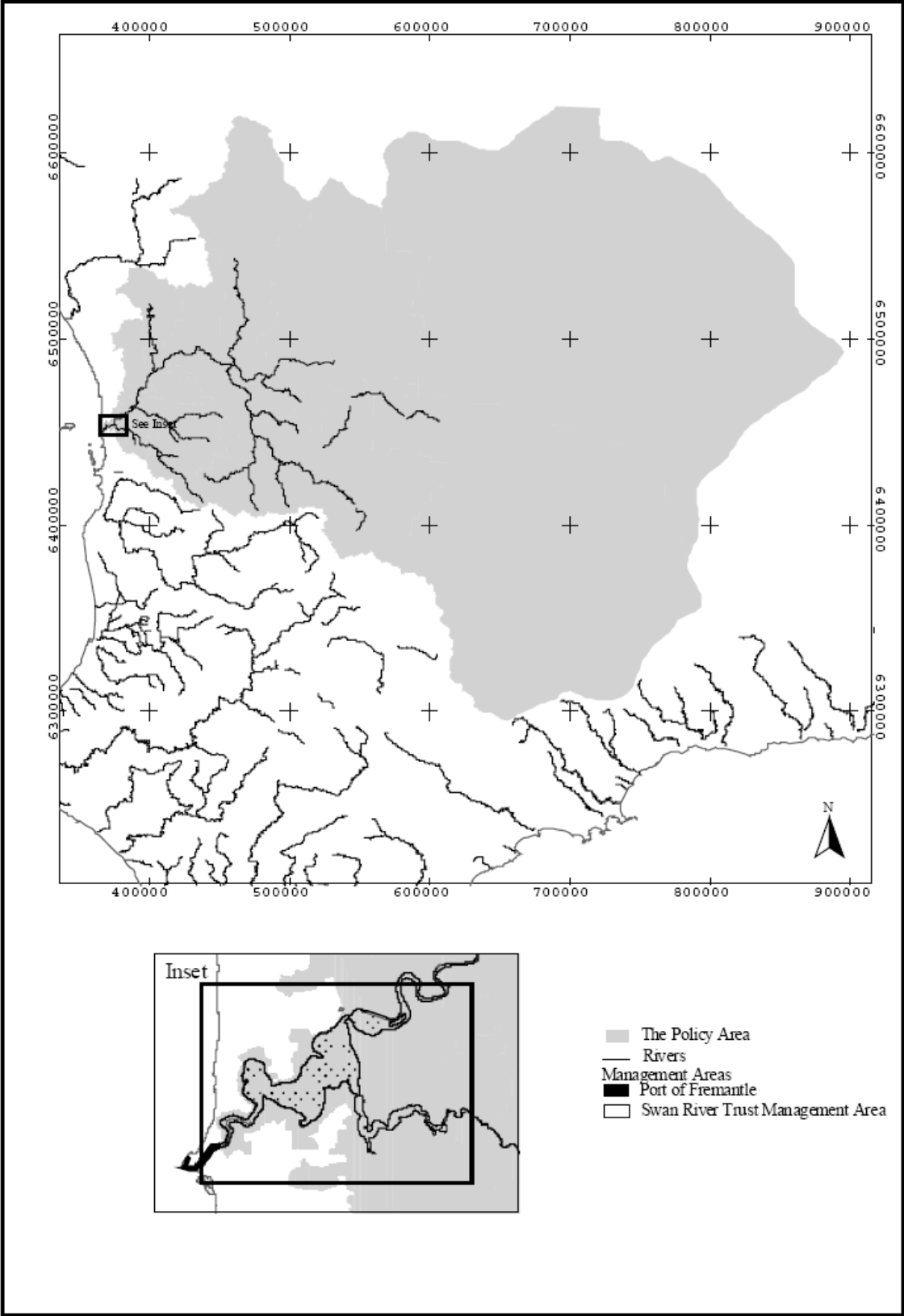


Plate 6: View of the Swan River with Perth CBD in the background (Source: Garry Middle).



Plate 7: View of Perth CBD across the Swan River at night (Source: Garry Middle).



As noted in the Gazettal notice for the EPP (Government of WA 1998:3683), its main purpose was to “Restore, enhance, preserve and protect the environmental quality, ecological processes and ecological integrity of the Swan and Canning Rivers”. The EPP:

- Defined a set of general beneficial uses for the system as well as some general environmental objectives to be met so as to achieve the beneficial uses;
- Allowed for specific water quality criteria targets to be set through regulation;
- Required that all decision makers act to achieve those objectives;
- Required that a comprehensive management plan be drawn up to guide the on-going management of the rivers and catchments and the rehabilitation of the rivers, and the plan had to be completed and submitted to the Minister by 1 December 1999. The EPP also set the requirements of the comprehensive management plan; and
- Established some measures that would ensure the environmental objectives were met.

These measures were, for the most part, very general without requiring specific actions by either government agencies or private individuals, for example:

Fringing vegetation within the policy area should be managed by taking into consideration the following factors ...

In determining whether the ecological processes are being maintained within protected waterway or protected watercourse regard shall be had to whether ...

There were a few exceptions where clear actions or prohibitions were set out, for example:

In order to protect the beneficial uses of the policy area –

- (a) wastewater treatment plants should not be established or operated to discharge wastewater (directly or indirectly) into protected waterways or protected watercourses unless the discharge ...

The EPP did not set out specific land use controls and made no direct reference to private land owners. The EPA recognised very early that a cooperative approach was needed to achieve the EPP’s objectives, which was highlighted in a presentation in late 1994 by one of the key officers in DEC advising the EPA on the draft EPP (Bott 1994), where he noted that:

'Command-and-control' approaches have been shown to be an effective form of management when point sources of pollutants can be readily identifiable. However, the downside of promoting command-and-control measures, or prescriptive Environmental Protection Policies (that is, a policy which stipulates acceptable and unacceptable practices), to the management of diffuse sources of pollution is the subsequent loss of management flexibility ... The management approach being promoted (in this EPP) is one of intergovernmental cooperation and integration.

(Bott 1994:82,83)

As the preamble to the EPP notes:

The Government of WA ... is aware that the development of environmental protection programmes and management-orientated research is required and stresses the importance of, and the need to promote, cooperation in that development and research.

(Government of WA 1998:3681)

A Comprehensive Management Plan was presented to the Minister by 1 December 1999, consistent with the requirements of the EPP, but the EPA recommended that it be revised before release for public comment. That Comprehensive Management Plan was never released for public comment, and it is not clear why. Instead, in 2004 *Riverplan* was released which was titled "Comprehensive Management Plan and Implementation Strategy" (Government of WA 2004). This followed a period of increased government interest in the management of the river system in the early 2000s.

As well, the Swan-Canning Cleanup Program Action Plan (Swan River Trust 1999) was also produced subsequent to the finalisation of the EPP which set water quality targets for each of the tributaries of the Swan and Canning Rivers for both nitrogen (N) and phosphorus (P). *Riverplan* built on these targets to propose a range of biophysical indicators are parameters to be measured and reported on that reflected the environmental health of the system and progress being made towards meeting the key N and P targets. *Riverplan* did not set performance criteria for these indicators and parameters but noted that:

The final environmental values and environmental quality objectives, indicators and associated criteria will be developed and reviewed by the relevant agencies and community representatives.

(Government of WA 2004:7)

Science is central to the EPP and *Riverplan*. Both documents require that monitoring of nutrients and other contaminants be carried out, indicators of environmental health be established and that limits (targets) be set on the level of these contaminants in the rivers. *Riverplan* steers away from setting specific management approaches and adopts an adaptive management approach where it is recognised that:

The variability of natural systems and our incomplete knowledge of the river and catchment processes require that management of the Swan and Canning rivers should be adaptive, improving in response to knowledge gained through monitoring and research.

(Government of Western Australia 2004:11)

Policy making approaches of the EPP and Riverplan

It is reasonable to conclude that the EPP attempted to be a collaborative approach, as it avoided the traditional expert-driven approach of requiring specific land use controls, and instead set out a cooperative framework for on-going management. The problem with the EPP is that whilst it tried to mandate cooperation, there was significant resistance from some government agencies. As one senior WAPC planner noted of the EPP:

(It) is meant to require a whole lot of other planners and people that do things (in the catchment) to take the EPP into account, but that ownership and recognition of the EPP being a tool for these people to use is not there.

A representative of the conservation movement noted that

The agencies maintained that they were actually doing some coordination, but if you look behind the scenes they weren't and they haven't been doing it.

As well, the level of participation can be considered to be at the IAP2's Consult level where a draft EPP was drawn up and sent out for public review, the views of stakeholders were considered but the decision making remained with the EPA who determined the form and content of final policy. The distance between the public and policy makers referred to in Chapter 2 is significant in this case.

Riverplan is a whole-of-government agreement on how to manage the river system cooperatively. A senior officers' group has been established involving all the key agencies, to ensure implementation of the plan. The plan proposes that formal agreements be established between the EPA and the key agencies responsible for implementation to, in effect, guarantee cooperation. It took 6 years for the cooperative approach envisaged by the EPP to eventuate.

The EPP also proposed an adaptive management approach in achieving policy objectives, and *Riverplan* re-enforces the need for an adaptive management approach by setting as one of the key management framework principles the following:

Recognising the variability of natural systems and our incomplete knowledge of river and catchment processes requires that management of the Swan and Canning Rivers should be adaptive, improving in response to knowledge gained through monitoring and research.

(Government of WA 2004:11)

The above discussion suggests that identifying the actual policy making approach of this EPP is not as simple as with the other EPPs. It could be argued that the approach has many of the elements of an adaptive-collaborative approach. It recognises the need for a cooperative approach between the key agencies and the broader community, as well as requiring that adaptive management measures be used as part of implementation. As well, the two key agencies cooperated in the development of the EPP — DEC and the SRT —

but the cooperation of other key stakeholders, notably local governments, land owner and the large number of community and industry groups, was not sought through the EPP process. The limited extent of cooperation needed for the EPP and the “Consult” level of participation is not consistent with the adaptive–collaborative approach.

The EPP is really a tool that *mandates* cooperation using the statutory powers of the EPP rather than being a *process* where cooperation is finally achieved. More importantly, the fact that the EPP met opposition from some key agencies and that it took six years to develop *Riverplan* suggests that the cooperation in the development of the EPP was very limited. As well, whilst the EPP identified the need for adaptive management, the EPP itself was not adaptive but highly prescriptive. In summary, the limited cooperation achieved during the policy making with participation only at the at IAP2 (2007) Consult level, suggests that the EPP is a traditional expert–driven approach that mandates cooperation and adaptive management for implementation.

On the other hand, *Riverplan* adopts an adaptive–collaborative policy making approach. In particular, it recognises the need for a range of agencies and the community groups to work cooperatively to achieve a healthier river system. The participation involved in the formation of *Riverplan* required for its implementation will be extensive, involving many community groups and the key agencies. The Senior Officers Group set up to oversee the implementation of *Riverplan* has representatives from 11 government agencies, WA Local Government Association, the Swan and Avon Catchment Councils, and the Chamber of Commerce and Industry. As well, formal agreements are required between the EPA and over 25 management groups, community groups and government agencies. This extensive participative process and the formal agreements suggests that decision making is shared, both directly and implied, which is consistent with the IAP2’s (2007) Collaborate level of participation.

As well, *Riverplan* recognises the need for adaptive management because of the inherent ... variability of natural systems and our incomplete knowledge of river and catchment processes requires that management of the Swan and Canning Rivers should be adaptive, improving in response to knowledge gained through monitoring and research.

(Government of WA 2004:11)

The EPP and Riverplan as a policy making package

Because the EPP and *Riverplan* were designed to work as complementary policies, it is more appropriate to view the EPP and *Riverplan* as a policy package. In this case, the package is dominated by *Riverplan* because it is the key implementation tool. The package, therefore, should be seen as adopting a predominately adaptive–collaborative policy making approach.

Policy making evaluation of the EPP

This section evaluates the policy making of the EPP in isolation and does not consider *Riverplan*. It was not possible to evaluate *Riverplan* because insufficient time has passed since its introduction for data to be available relevant to its performance. Given the conclusion made at the end of the last section, this may not be fair as both the EPP and *Riverplan* should be seen as a policy package. Notwithstanding this, the evaluation of the EPP in isolation does provide some useful insights relevant to this study.

Given the nature of the EPP — it is complex with a long time frame for implementation and the implementation mechanism is also complex — criterion policy-making performance will be determined using downstream decision making is consistent with policy criterion. The lack of cooperation from the key decision makers, the WAPC, affected local governments and other government agencies, meant that few if any policies were initiated by those agencies in response to the EPP for many years following the finalisation of the EPP. The WAPC (2006) did finally produce an SPP for the Swan and Canning Rivers at the end of 2000, but it only made passing reference to the EPP where it requires local governments to ensure that the SPP:

... together with the Swan Canning Rivers Environmental Protection Policy and other relevant State and local policies, are to be taken into account by the relevant decision making authorities when plans and development proposals within the area to which this policy applies are determined.

(WAPC 2006:5704)

Further, it took 6 years after the gazettal of the EPP for *Riverplan* to be developed. As one interviewee noted:

I'm on the Swan River Trust, and it's not a policy that's referred to very frequently by the Swan River Trust or the Commission (WAPC).

It can be concluded, therefore, that the EPP was unsuccessful on the performance effectiveness criterion.

On the political support criterion, the length of time taken to finalise the policy (three years) reflects the concerns about the policy and suggests that the policy making has been unsuccessful on this criterion. As well, the interviewees expressed a clear view that the policy failed: Table 10 shows 6 interviewees expressed a view that it failed and none that it was successful.

Evaluation of the policy making of the EPP on the content relevance criterion is a little more complex. The EPP addresses a significant environmental issue, given that Swan and Canning Rivers are in need of considerable attention to avoid significant algal blooms. As well, the EPA itself makes reference to it when assessing new proposals within the catchment, recognising that it sets the broad environmental quality objectives for the system (for example: EPA 2007), although it makes direct reference to the water quality targets set

in the Swan–Canning Cleanup Program Action Plan for the actual assessment (Swan River Trust 1999).

Several interviews criticised the content of the EPP claiming that it is too general and is difficult to interpret. The following comments on the EPP reflect these concerns:

I wouldn't have a clue what it is. I think I know what it is trying to do but I cannot see that there is any programme in place to do anything about it ... is just too broad, too general and isn't targeted in a way which tries to influence behaviour of particular decision makers, for instance. I'm not sure where the Planners see it, and yet they are a fundamental driver in terms of achieving your outcomes...

If you look at the Swan–Canning, statement by statement, you can't disagree with it. What does it mean? How do you translate it? It's one of those problems with that policy is that it is meant to be something that a whole lot of other Planners and people that do things and take into account. But that ownership and recognition of EPPs being a tool for these people to use is not there.

... is very general. It relied, in terms of the implementation mechanism, on the preparation of a programme of actions which has not eventuated...

This may in part explain why the EPP was slow to be implemented: the relevant agencies simply could not work out what they had to do. The idea of ownership was raised by interviewees, which relates to getting the cooperation to implement the policy, for example: "But that ownership and recognition of EPPs being a tool for these people to use is not there." The clear over-riding theme here is that there is concern about the EPP's implementation: the content was unclear and insufficient guidance was given to the agencies required to carry out the policy.

It could be argued, therefore, that because little direct reference is made to the EPP other than as a high level guiding document, and that other policy documents are more directly applied and referred to, the content of the EPP is not relevant and, therefore, on this criterion the policy making of the EPP can be considered unsuccessful.

On the final criterion, other socio-economic impacts, the policy making of the EPP can be considered successful given that the EPP was aimed at government agencies, and private land owners were not directly affected by it. The nutrient targets set in the Swan–Canning Cleanup Program Action Plan are having an impact on new developments in the catchment where drainage and stormwater management now has to be best practice, which is not necessarily required of developments outside that catchment (see discussion in Wungong development in the next section). Indirectly, therefore, the EPP is affecting the cost of new developments in the catchment.

To sum up, whilst the EPP had no discernable other socio–economic effects, policy making of the EPP can be considered unsuccessful on the policy–making performance, content relevance and political support criteria.

Linking policy making approach, policy making evaluation and nature and extent of the conflict

There is a fairly high level of conflict associated with the policy making of this EPP. There is no doubt that the river is valued for a whole range of reasons by a large number of individuals and groups with diverse interests. As *Riverplan* notes of the river system:

It is the most intensely used river system in Western Australia and is highly valued by the community for its aesthetic, recreational, commercial and environmental importance. These many, and sometimes competing uses are placing increasing pressure on the rivers.

(Government of WA 2004:1)

As well, several of the interviewees identified the existing conflict over the different values, for example:

I think you are dealing with a much larger area and a much larger group of stakeholders who do not have a common position.

However, this conflict over values was played out through the implementation of the EPP, particularly through *Riverplan*, rather than through the EPP. This reflects the overall low public interest in the EPP, which is directly related to the EPP being focused on government and agency actions rather than setting controls on private land uses.

The science in support of the management of the system is poorly understood and at times highly contested (Government of WA 2004) which is typical of river systems world–wide set in urban contexts, but a review of the documentation shows that there was very little debate on these matters as part of the policy making for this EPP. This is largely because the EPP deals with high level environmental objectives which were generally easily agreed to. The contentious issues of water quality criteria and management targets to be achieved were left to later documents: *Riverplan* (Government of WA 2004) and Swan–Canning Cleanup Program Action Plan (Swan River Trust 1999).

This debate and the contested nature of the science that supports setting water quality criteria and management targets is reflected in a recent assessment by the EPA of a large proposal for residential development at Wungong. This is within the catchment of the Canning River covering approximately 1500 hectares of land, and is currently used for a range of rural uses (EPA 2007). There is still significant scientific uncertainty as to whether the change of land use would lead to an improvement in water quality in the Canning River. The EPA noted that:

... deterioration in water quality from (urban) development cannot be ruled out because modelling and experience do not yet allow confident prediction that water quality can be managed adequately. There is a knowledge gap regarding the performance of BMPs (Best Management Practices) under Western Australian conditions, and concerns about the mobilisation of nutrients already in the system. Infiltration of stormwater may be associated with eventual mobilisation of nutrients and possibly other contaminants in groundwater.

(EPA 2007:15)

The debate over the science supporting the management of the Swan and Canning Rivers will continue for some time yet.

The governance of the river system as proposed by the EPP cuts across many agencies, State and Local, and whilst the EPP attempted to provide greater coordination of these agencies and their management, little success has been achieved to date. As noted in one of several recent management plans for parts of the system:

The feedback gathered from Local Government and State Government agencies indicate that these authorities often have different approaches/objectives to the management of the rivers due to different departmental requirements and priorities.

(Hassell Ltd 2006:5)

The interviewees also noted the problems of governance and the conflict that exists, for example:

... of course the Swan River one, there are so many agencies that are involved in the management of the Swan, and the Swan River Trust's jurisdictional area is really only the foreshore, and it has made it quite hard for them. I think, to really coordinate management.

There remains significant conflict over the governance of the system.

To sum up, whilst there is considerable conflict between different stakeholders over the management of the river system (i.e. values), and the science that supports management is both uncertain and highly contested, very little of this conflict emerged in relation to the policy making of the EPP. These conflicts are being played out through the implementation of the EPP through *Riverplan*. The key conflict that was played out through the EPP, and has been resolved through the implementation phase, was governance and the lack of coordination between the relevant government agencies. Whilst the EPP attempted to address this conflict specifically, it was not substantially addressed until 2004 with the final release of *Riverplan*.

As noted above, the proposed approach of the EPP — adaptive—collaborative — was correct given the nature and extent of conflict here, but, as argued above, because the EPA tried to *mandate* cooperation the actual approach adopted was traditional expert—driven (in effect, mandated collaborative). Consistent with the hypothesis in this thesis, given the

nature and extent of conflict that surrounds the management of the Swan and Canning Rivers, a traditional expert-driven approach would fail. This is reflected in the findings above where it was concluded that, whilst the EPP had no discernable direct other socio-economic impacts, it was found to be unsuccessful on the performance effectiveness, political support and content relevance criteria.

Whilst an evaluation of *Riverplan* has not been carried out here, it is consistent with the hypothesis in this thesis that *Riverplan* would be successful as it facilitates cooperation through its highly participative processes and formal agreements (there is at least implied decision sharing) and adopts an adaptive management framework — it is, in effect, an adaptive-collaborative approach.

Overall assessment of EPA's policy making

Introduction

Table 12 summarises the above analysis and gives a useful overall evaluation of EPA's policy making. Four key conclusions can be drawn from the data and the analysis in the previous sections and are discussed in detail below:

- The EPA has had mixed success in its EPP policy making;
- There is a direct relation between the EPA's successful policy making and level of conflict, in particular, policy making in highly contested contexts were all unsuccessful;
- The second conclusion provides some support to the hypothesis in this thesis; and
- A new model of environmental policy making seems to be emerging that has considerable promise in dealing with highly contested policy making contexts.
- As will be seen, a significant issue that emerges from this discussion is that despite recent policy failure in contexts where conflict is significant, the EPA has been slow to use a policy making approach that would more likely succeed in these highly contested contexts. To examine possible reasons for this, the key individuals within the EPA and individuals representing key stakeholder groups involved in the policy making in WA were interviewed. The relevant material from those interviews is discussed and some key conclusions drawn.

Table 12: Summary of the analysis of environmental policies

Policy	Nature and extent of conflict	Policy making approach	Study Evaluation	EPA evaluation
Draft Western Swamp Tortoise EPP	Values – significant; Governance – significant; Science – significant	Traditional expert-driven.	Performance effective – unsuccessful; Political support – unsuccessful; Content relevance – unsuccessful; Other socio-economic impacts – unsuccessful	Not evaluated
Kalgoorlie air quality EPPs – 1989, 1992	Values – low; Governance – low; Science – low	Traditional expert-driven.	Performance effective – successful; Political support – successful; Content relevance – successful; Other socio-economic impacts – successful	Successful but modifications required
Ozone EPPs (1989 & 1992)	Values – low; Governance – low; Science – low	Traditional expert-driven.	Performance effective – successful; Political support – successful; Content relevance – successful; Other socio-economic impacts – successful	Successful but modifications required
1992 Kwinana air quality EPP	Values – low; Governance – low; Science – low	Ecological modern.	Performance effective – successful; Political support – successful; Content relevance – successful; Other socio-economic impacts – successful	Successful
1999 Kwinana air quality EPP	Values – significant; Governance – moderate; Science – significant	Ecological modern.	Performance effective – successful; Political support – unsuccessful; Content relevance – unsuccessful; Other socio-economic impacts – unsuccessful	Not evaluated
1992 Lakes EPP	Values – moderate; Governance – low; Science – moderate	Traditional expert-driven.	Performance effective – successful; Political support – successful; Content relevance – successful; Other socio-economic impacts – successful	No conclusion but changes needed

Policy	Nature and extent of conflict	Policy making approach	Study Evaluation	EPA evaluation
1999 draft Wetlands EPP	Values – significant; Governance – significant; Science – significant	Traditional expert–driven.	Performance effective – unsuccessful; Political support – unsuccessful; Content relevance – unsuccessful; Other socio–economic impacts – unsuccessful	Not evaluated
1998 Swan Canning EPP	Values – low; Governance – significant; Science – low	Traditional expert–driven (a mandated collaborative approach)	Performance effective – unsuccessful; Political support – unsuccessful; Content relevance – unsuccessful; Other socio–economic impacts – successful	Not evaluated

Mixed success of EPA policy making

Of the ten EPPs and drafts to have their policy making evaluated used here, six can be considered successful overall (successful on all four criteria), with the remaining four unsuccessful (unsuccessful on at least three out of the four criteria). There was one EPP where the evaluation carried out here differed from the EPA — the 1999 Kwinana air quality EPP — where the EPA determined it had been successful, whereas the study evaluation concluded that it had been unsuccessful overall. It should be noted, however, that five EPPs have not been subject to an EPA review or evaluation.

The difference in evaluations for the 1999 Kwinana air quality EPP can be explained because of the narrowness of the EPA evaluation which relied solely on performance effectiveness as the only criteria for measuring success. The study evaluation noted the EPP was successful on the performance effectiveness criterion, but was unsuccessful on the three additional criteria. The evaluation methodology used in this study, it is strongly contended, is a better measure of policy success/failure. As was argued in Chapter 4, relying solely on effectiveness as a measure of success has significant problems.

Policy making success and conflict

There is a direct relationship between successful policy making and low levels of conflict: or, put the opposite way, the policy making of those EPPs that have involved significant levels of conflict have all been found to be unsuccessful. A reasonable explanation for this is that the policy making approaches adopted for all of the EPPs have either been traditional expert–driven or ecological modern, and, as has been postulated in this thesis,

these approaches are likely to be unsuccessful in policy making contexts where conflicts are high.

There is a chronological relationship here as well. Those EPPs initiated in the late 1980s and early 1990s have all been successful, whereas the two EPPs that were initiated in the late 1990s (Western Swamp Tortoise and Swan Canning) were both found to be unsuccessful and two of the early EPPs reviewed in the late 1990s were also found to be unsuccessful. These early EPPs addressed environmental problems that were relatively uncontested and where there was considerable community support for policy action: Ozone EPP, Kalgoorlie and Kwinana air quality EPPs. Most of the remaining areas of environmental policy making are more likely to be highly contested. As well, community expectations and values have changed over time, which accounts for the conclusion here that whilst the 1999 and 1992 Kwinana air quality EPPs were identical, the policy making of the 1992 EPP was found to be successful whereas the policy making of the 1999 EPP was found to be unsuccessful — it was effective in attaining its limited objectives, but its contents were considered to be too narrow, it lacked political support and there were demonstrated negative socio-economic effects.

The EPA, therefore, did not adequately recognise or address the increased level of conflict associated with the policy making of the later EPPs and did not change its policy making approach accordingly. Instead, it remained with policy making approaches it was familiar with and which had been previously successful.

The Lakes EPP can be seen as perhaps an anomaly here in that the level of conflict was reasonably high, but the EPP can be seen as successful even though it adopted a traditional expert-driven approach. One possible explanation for this, as noted above, is the influence of the policy champion, the then chairman of the EPA, but some caution must be used here. Firstly, the influence of a policy champion has not been tested here and it is not put forward here as a possible explanation. Further, the presence of a policy champion in this case may have been influential in the policy outcome, but the level of conflict associated with the 1992 lakes EPP can be considered moderate compared with the level of conflict associated with more recent policy making. It is unclear, therefore, that having a policy champion in cases where the policy making approaches were traditional expert-driven and ecological modern would have lead to successful policy outcomes.

In defence of the EPA sticking with the traditional expert-driven and ecological modern policy making approaches, it could be argued that the nature of EPPs, being statutory policies that are in effect legislation in their own right, only lend themselves to these highly prescriptive approaches. Consequently, the EPA is constrained in its policy making. There is, however, one significant problem with this argument.

If the above analysis is looked at historically, it can be seen that the EPA began to recognise the need for more collaborative approaches to policy making in the later EPPs — Swan Canning, Western Swamp Tortoise and the 1999 Kwinana EPP. The problem is that

the EPA did not adopt a collaborative approach to the *process* of drawing up the EPPs. The approach was highly centralised with the EPA and the officers supporting the EPA, and the participation was at best at IAP2 (2007) Consult level: that is, the EPA did not share decision making with interested stakeholders. So, if the EPA was aware that a collaborative approach was needed, and was of the view that EPPs could only use traditional expert-driven and ecological modern approaches, an option for the EPA was to not use the EPP mechanism and opt for a non-statutory policy. This would free up the EPA to develop policy making in a collaborative manner rather than attempting to mandate it as part of policy implementation. The recent initiative of the EPA to develop non-statutory SEPs as an alternative to EPPs is perhaps a sign that the EPA is of the view that EPPs have limitations.

There is, however, an alternative argument in that the EPA could have adopted a more participative policy making approach where the public is involved more often and very early in the policy making process before key decisions about the EPP are made (for example, before a draft is developed). There is no statutory requirement that prevents a more participative approach typical of IAP2 (2007) Involve level or even Collaborate level, so that decision sharing is effectively implied. It has been the practice of the EPA to adopt an expert-centred, limited participation process to policy development. It is possible that if the EPA adopts a participative approach to developing an EPP typical of IAP2 (2007) Involve or Collaborate levels the outcome could be an agreement to use command and control or free market *mechanisms* in EPPs, or that adaptive management measures should be applied.

Implications for the research question

As noted in Chapter 1, the research question examined here is: “what policy making approach is most likely to succeed in highly contested contexts where levels of conflict are significant, both in intensity and complexity?” Implicit in this question is that some policy making approaches are more likely to succeed in highly contested contexts than others. The above analysis shows that in all its policy making the EPA adopted either a traditional expert-driven or an ecological modern approach, irrespective of the nature and extent of the conflict, and that in each case where conflict was high the policy making was shown to be unsuccessful. This is consistent with the argument made in Chapter 2 that neither of these approaches would be successful in cases where conflict is significant.

The particular focus of this thesis is the adaptive-collaborative approach to environmental policy making, and it was argued in Chapter 2 that this approach has the capacity to deal with all of the conflict embedded in modern environmental policy making. Whilst no EPP adopted this approach, the Swan-Canning EPP and *Riverplan* policy package is an adaptive-collaborative policy making approach. Unfortunately, there is insufficient data available to do an evaluation of this policy making, but this policy package arrangement represents an evolution in environmental policy making and is more likely to be successful

as it is primarily an adaptive–collaborative policy making approach. This new model is discussed in detail next.

A new model of environmental policies?

Despite the failure of the more recent EPPs, and if a broader perspective is taken, the recent policy making of the EPA shows some promise in dealing with conflict. The final Western Swamp Tortoise EPP and the subsequent policy making and decision making of the WAPC and City of Swan suggest that land use planning will be done in the catchment in a manner that should protect the two remaining habitats of the Western Swamp Tortoise, consistent with the EPP. Unfortunately, it took considerable time to get the cooperation of these two agencies, and it required a significant re–write of the EPP to achieve this. As well, the involvement of land owners has been limited.

Similarly, there is some indication that the Swan–Canning EPP, taken as a package with *Riverplan*, would be successful. In this case, there was a clear intention that the EPP and the management plan would work together from the outset, with the EPP setting the broad policy objectives framework as well containing a list of the key issues to be addressed by the management plan.

The model that seems to be evolving here is one where an EPP and a more prescriptive *implementation* policy are developed together so as to be complementary. The implementation policy could be non–statutory with a less stringent process for initial approval and for any subsequent changes. The EPP sets high level objectives as well as dealing with specific non–negotiable issues (for example, not–to–be–exceeded targets). The implementation policies would contain the detailed policy and management measures that seek to achieve the objectives in the EPP. This model builds on the success of some earlier EPPs — the Kwinana and Kalgoorlie air quality EPPs — pairing the EPP with the licensing processes of the DEC, where the EPPs set the overall objectives and air quality criteria and the licences prescribed industry specific emission rates and management measures. The model can be called concurrent–complementary.

Two clear differences can be seen between these earlier EPPs and later ones. First, the level of conflict with the earlier EPPs was significantly lower than the later ones. Second, the main technical advice to the EPA on the EPP came from officers in the DEC who were also involved in managing licences of industry through the implementation of the EPPs. In this way, the cooperation of the downstream decision making agency was ensured. If this is the evolving model for future policy making by the EPA, then it needs some refinement to be successful in the highly contested context.

First, both policies (the EPP and implementation policy) should be developed concurrently rather than sequentially. In this way, the links between the two can be better ensured, and all stakeholders can understand the overall policy context as policy making proceeds.

Second, a highly participative process would be needed to allow both policy instruments to respond to community and stakeholder values and issues. If only one policy is subject to significant public involvement then only one policy can properly claim to represent those values and interests. For example, if the EPP is developed in the usual expert and agency-centred way and the implementation policy is subject to significant public input, there is a real risk that each will be based on different value sets, which would result in the links between the two policies being weaker and the overall package much less effective as a result. This participative process should commence very early on in the policy making process before any significant decisions about either policy are made, and decision making can truly be shared with stakeholders.

A concurrent process will also help overcome any governance conflicts and allow the debate over any uncertainty over the science to be played out through the policy making process and be taken into account in both policies. This process would ensure that the policies are complementary, in that the EPP sets the agreed objectives as well as specific non-negotiable matters that need a statutory basis for enforcement. These would need to be the subject of agreement through the policy making process and could include:

- Geographic boundaries to apply to the policies;
- Defining which agencies need to be involved in addressing the environmental problem which is the subject of the policy making;
- Empowering the implementation policy;
- Establishing a management framework;
- Agreed environmental standards or targets; and
- Exclusion of certain activities.

In this way, the EPP sets the agreed environmental outcomes and leaves the process and mechanisms for achieving these outcomes to the implementation policy. Where the science in support of setting standards or targets is uncertain and agreement cannot be reached, these would be excluded from the EPP and left to the implementation policy. The implementation policy can contain any adaptive mechanisms and contain flexibility policy and management measures. It has the advantage over an EPP in that it is easier to change where new information or modelling suggests changes are needed.

The Western Swamp Tortoise and Swan-Canning EPPs achieved complementary outcomes in the end, but the processes used to get there lacked the necessary collaboration, and the two levels of policy were not developed concurrently. As well, the EPPs were not subject to sufficiently inclusive participation and decision sharing processes. It is interesting to note that the major case study covered in Chapter 6 attempted to use this concurrent-complementary policy making model, and is one of the key reasons why it was selected for detailed study.

The above discussion suggests that the EPA is aware that a more collaborative approach is required, but has to date been slow to fully embrace this approach. It may be that risk aversion behaviour (referred to in Chapter 2) is at work here (Stankey et al. 2003; McAlpine et al. 2007). Risk aversion is where agencies, when faced with heightened uncertainty, prefer to apply traditional and known policy options rather than alternative methods that carry extra risk even if those traditional options have been shown to be unsuccessful in dealing with uncertainty. It may also be that the EPA has some institutional learning to do (Dallmeier, Alonso, and Jones 2002; Jacobson et al. 2005). To return to the Clark quote used in Chapter 2 on institutional learning:

Most institutions are not very good at learning, especially when such learning would entail significant revision of their own goals and operating procedures. Environmental management institutions are no better than the norm and may be significantly worse.

(Clark 2002:1)

To be fair, the EPA's successful policy making has involved traditional expert-driven and ecological modern approaches, so risk aversion is not surprising, and based on this, the EPA may believe that sufficient institutional learning has occurred. The next section explores the possible reasons why the EPA has been slow to fully embrace a collaborative approach to policy making in highly contested contexts.

Key elements of successful policy making

Introduction

One of the questions asked of the interviewees was what do they see as the key elements of successful policy making. Appendix 4 summarises the responses by listing the elements identified by the interviewees and the number of times each element was identified. Table 13 below shows those elements or attributes identified by eight or more interviewees. Conflict, the central theme of this study, was directly referred to by only six interviewees. Possible reasons why conflict was not rated more highly as a key element of successful policy making will be postulated later in this chapter. Analysis of these seven attributes suggests that they can be categorised as one of two types. The top three attributes are higher level considerations, and analysis of the interview responses suggests that there is an underlying tension about how environment policy making should be carried out, which may in part account for the EPA's lack of success in policy making in highly contested contexts. These are the policy making approach attributes. The remaining four attributes can be considered lower order issues about the details of the policy making processes rather than considerations of overall approaches. Discussion of these attributes is not included in the main part of this thesis but is included as Appendix 5. This was done because, whilst they raise some issues relevant to environmental policy making in general,

they are of little relevance to policy making in highly contested contexts. The conflict management/avoidance attribute will be discussed.

Table 13: Summary of the main attributes of successful policy making as identified in the interviews

Attribute of successful policy making	No of Interviewees who identified that attribute
Participation	13
Good science/information	12
Political stakeholder acceptance/support of issue	10
Resources	9
Clear & limited scope	9
Implementation thought through	9
Policy champions	8
Conflict management/avoidance	6

Participation

Overview

Appropriate participation was identified as a key element of environmental policy making by all except two interviewees. Comments of the following nature were typical:

Some of the key elements of success, I suppose, were: the consultation process, definitely; the skill of the practitioner of the consultation process.

Interviewees commonly used the word consultation to mean the more generic participation as used in the literature. As noted in Chapter 2 consulting has a particular meaning when considering the full spectrum of participation levels as defined, for example, by Healey (1997). Three themes about participation emerge from an analysis of the interviews:

- Role of participation in policy making;
- Political benefits of participation; and
- Adequate participation as a reason for policy success.

Role of participation in policy making

The interviewees saw the role of participation in policy making in different ways, ranging across the full spectrum of participation opportunities, as these interview excerpts illustrate:

Because at the end of the day, consultation is about gathering information, about assembling it and coming to some decisions ...

Not only advising stakeholders in the community about our policies but also a rigorous process in taking in considerations, submissions into account. You don't only inform, you receive comments, and you have a process for considering those comments ...

Public policy and participatory democracy – it's to negotiate not impose ... I don't think you can develop properly public policy without being inclusive about it, for exactly the same reason we have been talking about – power is shared;

I think we can reach a happy medium where community are genuinely partners with government in the way decision making happens in natural resource management.

It is important to note that interviewees were responding at the general level and not a policy-specific level. Consequently, responses reflect the interviewee's preferred overall approach to environmental policy making and the role of participation. Two different views can be seen from these responses. The first interviewee sees participation at the lower end of the IAP2 (2007) participation spectrum at the Inform level, whereas the next interviewee sees it at the Consult level. Both these views are consistent with a traditional expert-driven or ecological modern approaches to policy making, where input from the community is either minimal (traditional expert-driven) or corporatist (ecological modern). The last two interviewees see participation at a higher level where there is some sharing of decision making, typical of the more participative collaborative and adaptive-collaborative approaches.

It should be noted that whilst most of those who held the view that participation should be at IAP2 (2007) Inform or Consult levels were from government agencies, there were some from outside government who held this view. Similarly, whilst most of those who held the view that participation should be at IAP2 (2007) Involve or Collaborate levels were from outside government, there were some from within government agencies who held this view. These biases are not really surprising as it is often the community who lobby for greater engagement in government decision making and government decision makers have the most to lose where decision making is shared.

Political benefits of participation

Several interviewees were of the view that an adequate participation process carried out during the policy making process gives greater authority and credibility to the policy and makes it more likely that it will be agreed to by relevant decision making authorities and government. For example:

But I guess the strongest and weakest argument that the community put forward is, "we hadn't been consulted", and it's strong because politicians listen to it and it's the

weakest because it's usually wrong ... and my experience is that Ministers will always come to you and say, "you haven't consulted", and it's very easy to demonstrate how we have done it, and that usually satisfies them.

Obviously, more weight is given to a policy which has been through a process of public consultation and public scrutiny.

But the main thing (regarding participation in policy making) is the legitimacy of the policy. That is something that has become more important over the years ... Well, they accept it because it's been through a process. You can say, "well, basically, industry supports it, we've got a letter from the HIA, we've got a letter from UDIA, Local Government supports it, WALGA has said this, and, basically, we've got submissions from vested interest groups who've said this. We haven't been able to satisfy that but there's a reason for it." At least nobody's been bypassed. So, you can go to the (Planning) tribunal on that basis and they say, "well, obviously it's a policy that's been well researched, it's not a secret policy, everyone knows about it, everyone has been given the opportunity to influence it, so it seems to be on balance as good you can get. We're not likely to come up with something better, we'll take it seriously."

This issue of legitimacy is significant in defining and achieving successful policy, and it seems achieving this legitimacy is, for some policy makers, the most important reason for having a participatory process. This is consistent with views expressed in the literature about the reasons for better participation in decision making (Stirling 2006). As argued by Patten (2001:222): "democratic legitimacy really depends, above all else, on the character and quality of public deliberation and on the relationship between public deliberation and state decision making".

There are two ways to look at this. The first is that getting political legitimacy requires addressing and managing conflicts, and that the nature and extent of participation allows this conflict to be addressed. As argued by Holzinger (2001:72), conflict resolution is "tied, however, to elevated expectations concerning increased participation, procedural justice, and greater transparency". This is consistent with both collaborative and adaptive-collaborative approaches to policy making. The second way is that participation is seen as a process of legitimising what the policy makers have already decided upon, and the participation process allows policy makers to argue that a policy has been endorsed by the community. This is what Stirling (2006:96) calls "strong justification" where "there is a desire to justify a particular decision outcome that may be favoured by decision makers for entirely different reasons", where participation is designed "in such a way as to condition the favoured outcome".

In this case, participation is at best IAP2 (2007) Inform level but is really Healey's (1997) Tokenism and is used to support traditional expert-driven and ecological modern approaches to policy making. This could be considered reasonable where levels of conflict are low, but where conflict is high, a tokenistic approach would not deliver stakeholders support and political legitimacy because the source of conflict has not been dealt with.

Adequate participation as a reason for policy success

Finally, whilst participation was the most commonly quoted attribute of successful policy making, participation was only once noted in relation to specific policies as a reason why a specific policy was successful. Whilst this seems surprising and almost contradictory at first glance, a likely explanation is that the adequacy or otherwise of participation causes other strengths or weaknesses to emerge in the policy: put another way, participation is a tool through which other attributes of policy success or failure emerge. Examples include political support, where participation is necessary to gain both political and stakeholder support, and raising community awareness where a good participation process would aid in the social learning that can occur as part of policy making.

Good science and information

The availability of good science and information was identified by all except three interviewees as a key attribute of successful policy making. Analysis of the interviewees' responses suggests that whilst good science and information is a significant factor for good policy making, there are two schools of thought about what the scope of science and information should be in policy making and, consequently, how environment policy making should be carried out.

Interviewees seem to have two diverging views about the nature of science and information as part of policy making. The first view is typified by the following responses:

I think we always work first and foremost from good strong principles of science in terms of environmental resources which are identifiable and real.

... [information is] absolutely fundamental, I think. Particularly for the natural resource area where you got to know where it is, what you've got left, what condition it's in, how much of it do you need.

I think a strong base, scientifically, and it's got to be based on good science or good background information so you are moving forward from a sound basis.

These responses reflect a view that traditional science is central to policy making where technical experts and hard science are crucial for a good environmental policy. It is probably not surprising that many of the interviewees saw a strong and central role for

science, given the tendency of the EPA to favour traditional expert-driven and ecological modern policy making approaches. Whilst many of the interviewees were not EPA members or staff, there is history of, and preference for, this type of environmental policy making in WA, both within the EPA and in the broader policy making community.

These same interviewees were likely to express another view, which is that science adds legitimacy to the process, as the following comments reflect:

The science gave it credibility, even though some scientists no doubt would argue with methodologies and other things, but I think that combination lead to a situation where it was difficult for people to argue too conclusively against what the recommendations were.

Based on research: obviously, if a policy is based on specific research which is carried out in a proper way then it will carry more weight than one which is written as a policy but there is no background to it. It might appear as a, kind of, good idea but if there's no research behind it I would say that it would carry less weight.

Legitimacy is a significant issue for government agency policy makers where policies require political support in order to get final approval. It is interesting that another key element of successful policy making is stakeholder and political support (discussed next). The credibility of the science is seen as one way to get that support.

Some of these traditionalists expressed frustration that sometimes science gets politicised, and, as a result, becomes a secondary consideration in policy making. For example:

... one of the things I identified as limiting the role of science and the influence of science in policy making is where you have a high level of conflict the issues becomes politicised. The whole policy process is then dominated by what you can get over the line, and the socio-political forces, rather than the Science which gets forgotten, and you end up getting a policy that you get out the other side that everyone can live with, and often, like with the South West Ag Wetlands EPP, the policy is so limited that it's not really worth the pain.

Whilst this is recognition that gaining acceptance requires more than just doing good science, it reflects a view that there is really a misunderstanding *of* the science rather than a disagreement *about* the science. This is an important point and re-emphasises a similar point made above, that these interviewees are of the view that all that is needed to get stakeholder acceptance is to better inform them about the policy and the science that supports it. In effect, politics has gotten in the way and has blocked this understanding.

There were, however, interviewees who take a different view about science, and see that the science itself can be the problem. For example, the limitations of science were noted by some interviewees:

Science is a good answer for scientists and it's possibly why it has worked there, but if you use science for people who are non-scientific, it can be really problematic. For example people might say, "you're telling me that there is no contamination here but I saw the smoke, I have to live here and I'm still worried about it." ... Perhaps it is the understanding, and that is not to say that you can't help someone else understand the science with enough work, but obviously that's going to take more time and more effort for them to get their heads around it, and so on.

Others noted some of the latent subjectivity involved in some science and its application. For example:

Science at the cutting edge is rarely black and white. Science is subject to interpretation like everything else. When you choose a standard, do you choose 500 or 550? Well, it's a human value judgement. If you say, "we're choosing 550 because that's the point at which 50% of the test animals or the humans within a kilometre will die", it's another value judgement — 40%, 50% or 60%. So it's that recognition and the ability of our people to, and it's another hobby horse for me, understand the application of science for itself and the importance of value judgement, and their two separate roles, and to bring them together, that makes for success or failure. And where we fail, Bellevue's a great example, is where we've gone out and said, "no, these are the scientific answers, we're the experts, and there's no problem and don't worry about it." Everyone over here said, "well we really don't understand it, but we live here and we saw the smoke and the drums and we don't like it."

These interviewees tended to see science and information as being broader than just the traditional science. For example:

Things either fall into the adequacy of the research in the first place and the adequacy of the understanding of the issues and the options and the concerns ... A lot of things fall into research, really, and that depends on the nature of the issue and what sort of research that you do. And whether it's something you can pick up by going to a place and staying there for a couple days or whether it really means interviews, surveys and that sort of gathering of information. You just got to be in a position when you can say, "well, I know enough"

You actually need to do a bushland inventory and that analysis of how much you need to get the adequate representation. Get the community view in there as well, pick up some of the amenity, local bushland, aesthetic, cultural heritage type aspects to it as well the biodiversity and other environmental things.

This view does not discount the role of traditional science and research, but suggests that local knowledge, community values (interviews and surveys), and non-scientific information (amenity and cultural heritage) have a place in policy making as well. These interviewees

are less likely to see traditional science as being central to policy making for the reason identified above. They note that human values need to be taken into account and these can rarely be defined in black and white, quantitative terms. Importantly, the subjectivity of the science needs to be acknowledged, as does the role of other sources of information.

These two views reflect the debate in the community (noted in Chapter 2) about the objectivity or subjectivity of science and its role in policy making (Allchin 2004; Huesemann 2002). As argued by Smith and Kelly (2003):

In technologically advanced societies, scientific knowledge has commonly come to enjoy special status, often being directly equated with 'truth'. In the last 30 years this perspective has been increasingly challenged, and there is a growing acceptance that scientific and technological expertise as used in decision making is neither necessarily disinterested nor objective ... This has led to on-going demands for mechanisms to integrate different forms of knowledge in the science-policy process, and to extend public involvement in policy debates.

(Smith and Kelly 2003:323)

There are two competing forces at work here. One where there is, as noted by Steel et al (2004), an

.. increasing emphasis among decision makers, interest groups, and citizens alike on the importance of more science-based environmental policy at local, regional, national, and international levels of governance", which is opposed to a growing sentiment in some communities that "scientific information may itself be biased; and, other types of policy actors, information, and values are more important in arriving at sensible public choices".

(Steel et al. 2004:1)

It is not surprising that the interviewees who expressed the first view about the role of science in policy making also saw participation as being at IAP2 (2007) lower end of the participation scale, mostly at the Inform level. This suggests that these policy makers see getting stakeholder support as an exercise of convincing stakeholders that the policy is legitimate because the science is good: Stirling's (2006:96) "strong justification". These interviewees would also likely favour traditional expert-driven and ecological modern approaches to policy making.

Similarly, interviewees who favoured the second view about the role of science in policy making also saw participation as being at IAP2 (2007) higher levels of Involve and collaborate, and would likely favour a collaborative approach to policy making.

Political and stakeholder acceptance and support

It is probably not too surprising that a majority of interviewees raised this issue, given the highly political nature of environmental policy making. Appendix 5 gives a full discussion of this attribute, but the key issues relevant here relate to problems of governance in policy making.

Some interviewees saw the lack of stakeholder support for policy implementation, mostly from key agencies, as a key reason for policy failure, despite there being some initial agreement that the policy should proceed, for example:

... this is part of the reason for the failure, divided responsibility for it. I think that's probably the simplest explanation for the failure of it. You've had different agencies responsible for different bits of it, and you haven't had a willingness for the agencies to cede ground to the other agencies. "Blow the Ag Department, we won't help them, we're in charge of this." Turf war sort of stuff.

This turf war issue was raised several times by the community interviewees. It was also evident that there was tension between the EPA policy makers and those from the WAPC, particularly where there was an overlap between environmental policies and planning. This was evident in both the Western Swamp Tortoise and Wetlands EPPs cases. The South-West Agricultural Wetlands EPP was singled out by several interviewees as a particular example of turf wars preventing successful policy making. For example:

.. with the Ag wetlands one, there is a jurisdictional competition or conflict between agencies as well. And I know that over the Agricultural one there was a heap of discussion between agencies about it.

You also had turf war happening between the agencies, and the whole thing is so watered down that in the end of the day you get one wetland in it, which I think is a nature reserve anyway. It's going to sit on the shelf and be useless

The fact that these tensions emerged at the implementation stage suggests that inter-agency conflict had not actually been dealt with, but had been put to one side so as to get the policy approved, suggesting an on-going governance conflict. Several interviewees argued that it was important that the agencies that will have to implement the policy as downstream decision makers support the policy. For example:

... maximise your ownership, particularly of those people who are either going to be positively or negatively affected by the policy. I mean, if they can own it, then you'll get a much better compliance and implementation of it.

And of course that includes the consumers, but also the people who are going to perhaps make it happen if there is a development involved, the people who are going to make the development happen and work.

Local government was identified by some interviewees as being particularly important as downstream decision makers for SPPs, for example:

... then making sure that the local authorities are directly involved and support it. I mean, they don't have to support every last letter of it ... but you would like to think that through their involvement in the preparation of the SPP that they have a high degree of ownership to help to implement and interpret it.

It was generally accepted that enlisting these agencies' support was critical in getting a policy implemented.

Conflict management and avoidance attribute

As indicated in Table 13, the need to address conflict and its management was not seen by many interviewees as a significant issue in successful environment policy making. A sample of the comments made in relation to conflict and policy making are:

The other key element is the ability of the policy makers to deal with the conflict. Conflict management came up in my work as being really, really critical. If you don't deal well with the conflict, you can have policy that avoids, that has low conflict it's a lot easier to be successful. But you generally find that the low conflict policies are the motherhood ones that are arguably not that effective anyway. Dealing with the conflict I think is, and it gets back to stakeholder acceptance.

And, this is related to why do policies fail, because, I think often, to a large extent politicians are not prepared to get in there and try and resolve conflicting issues. If you look at probably one of the main ones we have had over the last decade is land clearing. Politicians, because of the issues of equity and the like, have just pushed their heads in the ground and say, "we'll look, we'll let the thing bungle along" with no side having a clear way forward. I think politicians often do not take on the responsibilities they should do in trying to resolve differences between competing sectors and between different community considerations.

There are no real common themes that emerged from the analysis of the comments, but two specific observations can be made. First, there was a tendency of interviewees to see conflict as a negative factor, in that it is mentioned in relation to policy failure rather than policy success. The inability of policy makers to address the conflict was one reason for

failure, whereas there was no direct reference to good conflict management and policy success:

... and, this is related to why do policies fail, because, I think often, to a large extent politicians are not prepared to get in there and try and resolve conflicting issue ...

... I think sometimes they [planning policies] avoid confronting the conflicting issues, which comes back to my other point about no processes for getting resolution between conflicting community requirements ...

Second, there are a couple of comments that suggest that some policy makers may not actually *get* conflict and policy making. One interviewee saw conflict management as working against good science and leading to a compromise policy being produced:

... I identified as limiting the role of Science and the influence of Science in policy making is where you have a high level of conflict the issues becomes politicised. The whole policy process is then dominated by what you can get over the line, and the socio-political forces, rather than the Science which gets forgotten, and you end up getting a policy that you get out the other side that everyone can live with, and often ... is so limited that it's not really worth the pain...

This comment was made in relation to the 1999 wetlands EPP, and, as already noted, there was not only conflict over values, there was also conflict over the science. The affected community may well argue back that the science wasn't forgotten, it was challenged and the science of the policy makers was simply not accepted. The fact that the EPP is considered unsuccessful may be a reflection that the policy makers did not see conflict over the science as being significant.

Two views of policy making — a barrier to better policy making

This discussion suggests that there are two distinct views within the environmental policy making community in WA about how policy making should be carried out. One view sees that good hard science is central to good policy, that non-traditional sources of information have limited value, and participation during policy making should be at the lower of IAP2 (2007) Inform and Consult levels. This can be called a *science-focused* view of policy making. This view sees science as critical for a policy to gain legitimacy, where the validity of the science needs to be asserted. Participation, therefore, is the process of communicating the validity of the science in support of the policy. In this way, both stakeholder and political support will follow. This view sees that policy making should adopt either a traditional expert-driven or ecological modern approach to policy making.

The other view sees some weaknesses in the use of science in policy making (it has limitations and is not as objective as it claims) and that social values and non-traditional sources of information have a significant role to play. This can be called a *participation-focused* view of policy making. Participation should be at a higher level, either IAP2 (2007) Involve or Collaborate levels, with ideally some shared decision making. This view sees that gaining both stakeholder and political support involves dealing with concerns about the policy that either go beyond the science or are about the science itself. This view sees that policy making should adopt either a collaborative or adaptive-collaborative approach to policy making.

Following up on comments made in relation to participation, it should be noted that whilst most of those who held the science-based view were from government agencies, there were also some from outside government who held this view. Similarly, whilst most of those who held the participation-focused view were from outside government there were some from within government agencies who held this view. Of course, these two differing views can be accommodated in modern environmental policy making, depending on the context. Where conflict is minimal and the science in support of the policy is relatively uncontested then either a traditional expert-driven or ecological modern approach should prove adequate, and allocating additional resources to a comprehensive collaborative approach may not be warranted. Where conflict is significant and the science uncertain and contested, then a collaborative or adaptive-collaborative approach is required.

The concern is that these views are in competition and are about the way that policy making should be done, irrespective of the context. The predominance of the science-focused view within the EPA, the early successes of the EPPs, and risk aversion, would explain why the EPA is slow to move away from traditional expert-driven or ecological modern approaches in cases where the levels of conflict are significant. The emerging participation-focused view about policy making primarily from outside the EPA, but also from within, is pushing the EPA towards more collaborative approaches to policy making as observed earlier in this chapter, but not yet far enough to fully embrace this approach where appropriate.

Institutional learning within the EPA has some way to go, and as argued by Poncelet (2001), further learning may only occur once the EPA engages fully in a collaborative exercise, which would

... provide important opportunities to forward environmental problem-solving efforts and to overcome some of the entrenched conflicts that have handicapped environmental decision making in the past. Though seemingly small, these personal transformations may well serve as the foundation for future large-scale improvements in the domain of environmental management.

(Poncelet 2001:297)

Institutional learning may also need to be extended to recognising and managing conflict. The relatively low importance that interviewees placed on conflict, as part of policy making,

suggests that many policy makers in WA have yet to come to terms with the significance of conflict in policy making, and until they do, environmental policy making in these contexts will continue to fail. This is a significant conclusion. The low hanging fruit of environment policy making (cases where conflict is minimal) have already been picked, and many of the remaining areas requiring policy responses are highly contested. The tendency has been for policy makers to blame failure on a range of process type issues rather than ask the fundamental question: is the actual policy making approach adopted appropriate? It follows, therefore, that unless policy makers recognise this and adjust their policy making accordingly, continued policy failure is the most likely outcome.

Finally, the use of a collaborative approach would also help address the governance issues raised here, especially the turf war issue.

Summary

The above analysis goes some way to answering the research question here: what policy making approach is most likely to succeed in highly contested contexts where levels of conflict are significant, both in intensity and complexity? The review of policy making by the EPA showed that its policy making in cases where conflict was low were successful, but in cases where conflict was significant, policy making failed. It was noted that in all cases the policy making approaches adopted were either traditional expert-driven or ecological modern, which, consistent with the analysis in Chapter 2, would explain the policy failures.

It was argued that, despite the failure of the policy making of the EPPs in contexts where conflict was significant, the recent policy making of the EPA shows some promise in dealing with conflict. This was because the EPA developed its EPPs more collaboratively, resulting in the emergence of new policy model. This model involves two separate policies developed together so as to be complementary: an EPP which sets the sets high level objectives and deals with specific non-negotiable issues; and a more prescriptive *implementation* policy containing the detailed policy and management measures that would achieve the objectives in the EPP. These policies can be called concurrent-complementary.

Two distinct views exists amongst key policy makers in WA about how policy making should be done, based on the role of science as part of decision making and the level of participation that should be achieved. The predominance of the science-focused view of the key players within the EPA, and the success the EPA has had using the traditional expert-driven and ecological modern policy making approaches has encouraged the EPA to be risk-adverse and stick largely to traditional expert-driven and ecological modern policy making approaches. However, the emerging participation-focused view, primarily from outside the agency, is moving the EPA towards more collaborative policy making where appropriate.

The policy making approach of particular interest in this thesis — the adaptive–collaborative approach to environmental policy making — was not directly studied in this part of the research as none of the EPPs used the adaptive–collaborative approach. The case study covered in the next chapter is one where significant conflict was present, a concurrent–complementary policy making model is adopted, and an adaptive–collaborative policy making approach applied.

Chapter 6 – Case Study

Overview and significance of Cockburn Sound

This chapter covers the case study of contemporary environmental policy making set in a highly contested policy making context. It involves the environment of Cockburn Sound, which is a large marine embayment approximately 20 kms south of Perth (Figure 6). Cockburn Sound has a range of significant environmental values, including ecological, commercial fishing, recreational boating and recreational fishing. There are significant growth pressures on the Sound, with a rapidly growing nearby residential area, growing recreational use in the Sound and several new industrial projects proposed for its shores.

The health of the Sound began to deteriorate rapidly in the late 1960s and early 1970s, and considerable conflict emerged about how best to plan and manage Cockburn Sound. Following nearly thirty years of research into the Sound and growing community concern about its health, the State government recently initiated a new management and policy framework for Cockburn Sound centred around two government agency policies: an EPP developed by the EPA, and an Environmental Management Plan (EMP) developed by the Cockburn Sound Management Council (CSMC), a cooperative peak management body made up of representatives of the key stakeholders (see below). These two policies will be the focus of discussion and analysis in this chapter.

This Chapter has five major sections, which generally follows the approach taken to the analysis of environmental policies in Chapter 5. The first section provides important background information and sets the context for the case study by outlining the relevant biophysical elements of Cockburn Sound, providing the history of human use of the Sound and describing the history of relevant government policy and decision making. The second section provides specific details of both of the policies, and the third section explores the nature and extent of conflict at Cockburn Sound as the context for policy making. The fourth section describes the policy making approach adopted in each case. The final section provides a detailed evaluation of the policy making using the criteria established in chapter 5 and relates policy making approaches to policy success/failure and the level of conflict associated with Cockburn Sound.

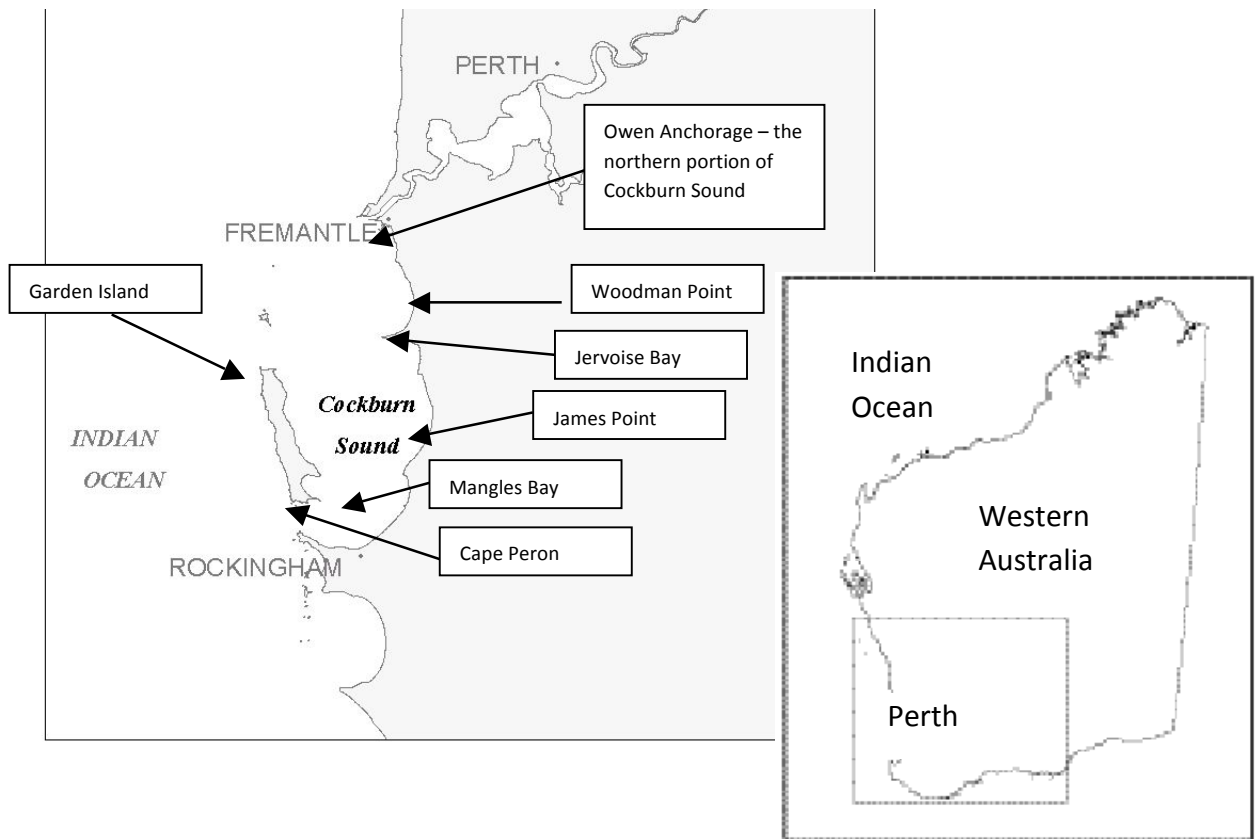
Chapter 3 provided the details of the overall methodology used in this study. The key data sources used in this case study were:

- Extensive interviews with the key stakeholders at Cockburn Sound, in particular, the members of the CSMC;
- File searches;
- Document searches (e.g. reports, newsletters, websites, news reports);

- CSMC meeting minutes;
- Observations made at CSMC meetings; and
- Observations made at public meetings held during the preparation of the two policies and follow-up, opportunistic interviews with participants.

Analysis and conclusions here are based on consideration of all of the data sources and selected quotations are used to highlight the arguments being made. They were chosen because they were either typical of many other responses or because they highlighted a particular issue of interest.

Figure 6: Location of Cockburn Sound, including Owen Anchorage (Source: Cockburn Sound Management Council website)



Background and context

Biophysical context of Cockburn Sound

The mainland and islands that form the boundaries of Cockburn Sound are part of the sandy Swan Coastal Plain, which is a series of dunal ridges of varying ages of up to 1 million years old. The current WA coastline was formed following a rapid rise in sea level around 10,000 years ago (D.A. Lord & Associates Pty Ltd and PPK Environmental & Infrastructure Pty Ltd 2001). The sea level rise was enough to fill the deep basins between elevated limestone ridges, part of which has become Cockburn Sound, which is 16 km long, 9 km wide with its central basin 17–22 m deep.

The marine waters of the WA coast are strongly influenced by the Leeuwin Current, which has its source at the equator. The waters of this current are warm, clear and relatively low in nutrients. Prior to European settlement the rivers that flowed to the coast carried relatively low volumes of water and low quantities of nutrients. These two factors plus the absence of any significant ocean water movements from the west means that the coastal waters of Western Australian are very low in nutrients by world standards (D.A. Lord & Associates Pty Ltd and PPK Environmental & Infrastructure Pty Ltd 2001).

Low levels of nutrients in marine waters do not favour the production of phytoplankton. Instead, seagrass is the main marine primary producer, forming vast meadows on the sandy banks and gardens on the reefs. Seagrass will only grow in the shallower waters where sufficient amounts of light can penetrate to the seabed. Seagrass meadows were the dominant primary producer in Cockburn Sound prior to the 1970s (Figure 8). The fauna in these waters are dominated by benthic species¹⁰ that feed directly or indirectly on the seagrass, and species that feed on the detritus¹¹ found in the deeper basins between the seagrass areas.

Human use, management and early policy responses

Cockburn Sound is the most significant and intensively used marine embayment in WA (EPA 1998) and is subject to a diverse range of competing interests. It is a significant habitat for a range of marine species, some exploited for commercial purposes, estimated to be worth nearly \$2 million a year. It is an important recreational boating and fishing area. Its eastern shores contain the State's most important heavy industrial area producing goods worth in excess of \$8.7 billion a year (KIC 2005), and the northern part of the rapidly-growing coastal town of Rockingham (since 1966 the population has grown from 2,500 to over 80,000). Garden Island, which forms the western boundary of Cockburn Sound,

¹⁰ Fauna species that live on and within the ocean or seabed.

¹¹ Dead and decaying material.

houses the Stirling Naval Base. A total of almost 1000 ships arrive in Cockburn Sound each year either servicing the industrial area or arriving at the naval base. As well, the sand banks in the northern portion of Cockburn Sound (also known as Owen Anchorage) have significant deposits of shellsand, caused by a combination of accretion of material eroding from nearby limestone reefs and accumulation of skeletal material from shelled marine fauna that inhabit the nearby seagrass meadows (Searle 1985). The calcium carbonate content in these banks is around 92% (D.A. Lord & Associates Pty Ltd 2000). These shellsands are dredged and used as the main raw material for the production of lime. Finally, the north eastern shores of the Sound house the State's main ship building area (Jervoise Bay). Figure 7 shows the location of these key uses of the Cockburn Sound.

Up to the 1960s, Cockburn Sound was used primarily for recreation and commercial fishing, but in 1954 the first major industry, an oil refinery, was established on the eastern shore. Between 1954 and the mid 1970s another five major heavy industries were established at Kwinana, and today there are over 30 heavy and supporting industries on the shores of Cockburn Sound. During the mid 1970s, the Commonwealth Government constructed a rock-based causeway to connect the southern tip of Garden Island to the mainland to allow better access to the naval facilities: two bridges were included with the causeway structure to allow marine water to flow through the Sound, although their efficiency in allowing adequate flushing of the Sound has been questioned (DAL Science and Engineering Pty Ltd 2002). Up until 1984, treated human effluent was discharged directly into the northern section of the Sound.

The first sign that the ecology of Cockburn Sound was under stress was the loss of the seagrass. It is estimated that since 1954 seagrass cover has reduced by 80% (Environmental Resource of Australia Pty Ltd 1971) – see Figure 8. The main cause of this loss is reduced light reaching the seagrass caused by increased phytoplankton growth in the water and algae growing on the seagrass leaves as a result of nutrient discharge into the Sound and the reduced flushing because of the causeway (Department of Environmental Protection 1996). Industrialisation also led to reduced public access to beaches and increased competition within the Sound between commercial shipping and recreational boats.

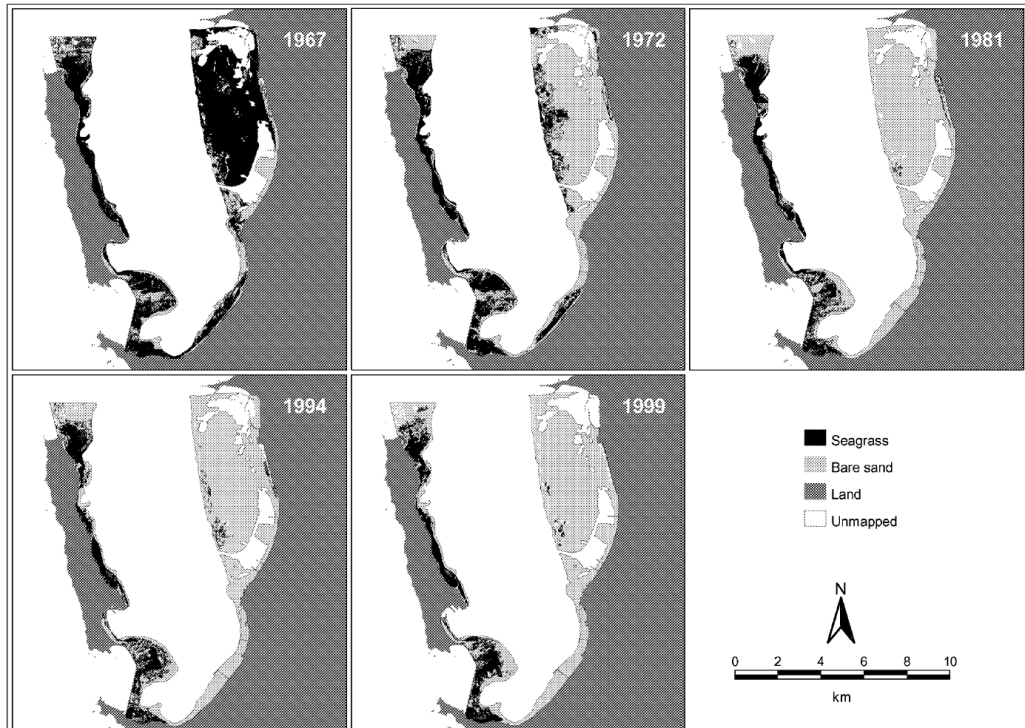
Figure 7: Location of the main land uses associated with the use of Cockburn Sound.



Whilst nutrients were the main concern with regards to the loss of seagrass, other discharges into the sound were also of concern, including heavy metals, oils and other hydrocarbons from industry, TBT (tri-butyl tin) from shipping, faecal and other materials

from stormwater drains from the urban catchments, and cooling water. Up to the late 1970s discharges of these wastes were not well controlled.

Figure 8: Seagrass decline in Cockburn Sound (Source: Kendrick et al. 2002)



In response to concerns about the decline in the health of Cockburn Sound a significant environmental study of the Sound was initiated by the Government commencing in 1976, with its major findings being presented in 1979 (DEC 1979). The study was a significant scientific undertaking examining water quality, flora, fauna and human uses of Cockburn Sound. Two of the key conclusions were:

- Recommended water quality criteria for the Sound should be adopted¹²; and
- Industry should make efforts to significantly reduce waste discharges into the Sound.

Industry, under pressure from the Department and through more restrictive licences, responded to the study by significantly reducing their waste discharges into the Sound during the early 1980s (Department of Environmental Protection 1996) which continues to the current day. As well, the government established a comprehensive water monitoring program. Nutrient discharges to the Sound are thought to have been reduced from around 2000 tonnes per year in 1978 to around 300 tonnes in 2000 (WRC 2001). Groundwater is

¹² Later proposed in a follow up report (Marine and Estuarine Water Quality Criteria Working Group 1981)

now believed to be the main cause of contamination, and its main sources are from diffuse and more difficult to control land uses such as market gardens and residential areas. In effect, the 1979 report acted as a policy document by providing the framework for subsequent decision making.

Table 14 below shows the reduced discharges by industry into Cockburn Sound between 1978 and 2000.

Table 14: Changes in industrial discharges by industry into Cockburn Sound (Source: D.A. Lord & Associates Pty Ltd and PPK Environmental & Infrastructure Pty Ltd 2001)

Year	Contaminant input (kg/year)							
	Arsenic	Chromium	Copper	Mercury	Lead	Nickel	Zinc	Oil
1978	Unknown	2,065	3,809	105	3,259	571	8,557	363,540
2000	34	1	600	2	16	79	1,077	4,557

Whilst efforts to improve the health of Cockburn Sound continued, there was growing community concern about the health of all of the coastal water in the Perth region. From 1986 to 1989 the DEC funded a study of the nutrient dynamics of Perth's coastal waters, which in turn led to a more substantial study from 1991 to 1994 called the Southern Metropolitan Coastal Waters Study (Department of Environmental Protection 1996). That report made a number of key recommendations, including that:

- Licences issued to industries discharging into Cockburn Sound require further reductions in the quantities of pollutants going into Cockburn Sound;
- A formal coordinated management arrangement be set up to enable better management of Perth's coastal waters;
- An EPP be developed for Perth's coastal waters;
- Five environmental quality objectives be adopted; and
- Environmental quality criteria be adopted that would ensure that the environmental quality objectives were met.

Whilst this report covered all of the coastal waters south of Perth, Cockburn Sound became the focus of attention, both for the community and policy makers, primarily because it is the most intensively used marine embayment in Western Australia (Department of Environmental Protection 2001). During this time a difference of view about the importance of Cockburn Sound became obvious between the policy makers and the broader community. The policy makers focused on water quality and seagrass issues, whereas the community wanted the human use aspects of the Sound addressed — that is, recreational uses (swimming boating etc.), fishing (commercial and recreational) and industrial uses.

• The Authors state that this is probably an underestimate.

These latter issues were made more significant in the light of success in improving water quality in the Sound and a halt to the loss of seagrass.

In part this difference of view emerged because the mandate of the environmental agencies (the EPA and DEC) does not include broader socio-economic concerns and no agency with that broader mandate had been involved in policy making for Cockburn Sound. The Southern Metropolitan Coastal Waters Study (SMCWS) produced at least 136 publications and small reports (see Directory of Publications in the main SMCWS report - Department of Environmental Protection 1996).

The EPA (1998), in response to the community's and its own concerns about the health of Cockburn Sound, produced a report in 1998 that provided "strategic environmental advice on the cumulative impact of infrastructure proposals on the water quality and marine ecology in the Sound" (P. 3). In arriving at its advice, the EPA organised a series of workshops with key stakeholders, decision makers and scientific experts with knowledge of the Sound. The key relevant conclusions of the EPA are:

- Whilst it was possible to provide a qualitative assessment of the likely cumulative impacts of the proposed infrastructure developments, the lack of relevant scientific information means that quantitative predictions of ecological changes that could occur are not possible;
- On-going research into the ecology of the Sound and the possible impacts of further developments are needed; and
- A management structure involving representatives of the Government and the community (including industry) be established to coordinate management of the Sound and its catchment is required.

The first two conclusions will be returned to later, but in response to concerns about governance at Cockburn Sound, the government proposed a new policy and governance framework, described in detail in the next section.

Descriptions of the two policies

Overview of the policy and governance framework

Within 12 months of the 1998 EPA's report being released, the State Government, on advice of the EPA, agreed to three initiatives aimed at better management of Cockburn Sound:

- Setting up of the Cockburn Sound Management Council (CSMC) to coordinate on-going management of the Sound and its catchment;

- The CSMC to prepare and implement an Environmental Management Plan (EMP) to guide management of the Sound and its catchment with high level stakeholder involvement in its preparation; and
- The EPA to prepare an EPP that, as well as addressing the key environmental issues for the Sound, would provide the statutory authority for the EMP.

This framework is an extension of, and improvement to, the evolving policy model referred to in Chapter 5 where an EPP and a more prescriptive and complementary implementation policy are developed — concurrent–complementary policies. The CSMC is a significant addition to the model in that it establishes a formal collaborative mechanism through which both the EPP and EMP will be implemented. The CSMC is made up of 23 members representing community, recreation and conservation groups, industry, State, Commonwealth and Local Governments, and has an independent Chair. It has no decision making powers but works to coordinate agency decision making in the catchment and Sound, oversees research, provides a forum for information sharing, and coordinates community (including industry) actions that impact on the Sound. It was formally established in 2000 with its first meeting in August of that year.

This model had an inherent fatal flaw, in that the EPP could only be limited to providing environmental protection with minimal coverage of socio–economic concerns whereas the CSMC and the EMP would need to address the broader socio–economic concerns of all stakeholders in the Sound. This flaw became apparent in a debate over the legality of the EPP, as discussed later.

First drafts of the EMP and EPP were released in December 2001 (CSMC 2001; EPA 2001), and both finalised in January 2005. The EMP was finalised relatively easily, but the progress of the EPP was much more complicated (see next section). The EPA had originally proposed to release a draft EPP in June 2001, with a scheduled gazettal date for the final EPP set at March 2002 (EPA 2000:8). This timetable was shown to be too optimistic for the EPP, but was not for the EMP.

Supporting the draft EPP were the following documents:

- An explanatory document (Department of Environmental Protection 2001); and
- Draft Environmental Quality Criteria and supporting information (EPA 2001).

Following consideration of the submissions on the draft EPP and supporting documents the EPA produced a revised EPP for consideration by the Minister in November 2002 (EPA 2002), along with a revised supporting document (EPA 2002). Concerns were subsequently raised about the legalities of the EPP (see discussion later) which ultimately lead the EPA to conclude that a statutory EPP that would have any value or relevance could not be written for Cockburn Sound. On advice of the EPA, the Government chose not to proceed with the EPP and instead released a revised policy for Cockburn Sound in the form of a non–statutory draft State Environmental Policy (SEP) in October 2004 for comment

(Government of Western Australia 2004). This was the first of this type of environmental policy, and to date remains the only one.

The content of the draft SEP had only minor changes from the last draft of the EPP. A final SEP was released in January 2005 with few changes from the draft (Government of Western Australia 2005).

The EPP/SEP

The aims of the EPP (EPA 2000) were:

- Establish environmental values (EVs) both ecological and social, environmental quality objectives (EQOs) and environmental quality criteria (EQC) for Cockburn Sound;
- Identify a program to protect EVs;
- Provide for the integration of environmental planning and management of the Sound and catchment by giving statutory authority to relevant government agencies to act to protect Cockburn Sound;
- Establish the authority and roles for the EMP and CSMC; and
- Provide a mechanism for regular reporting on progress in reaching the objectives.

These translated into the following policy “purposes” in the final SEP:

- (a) to declare, protect and maintain the environmental values of Cockburn Sound;
- (b) to abate pollutants and restrict activities that diminishes the environmental values of Cockburn Sound;
- (c) to establish a program to protect and enhance environmental quality to support the environmental values of Cockburn Sound;
- (d) to give effect to the environmental quality objectives and the environmental quality criteria for Cockburn Sound; and
- (e) to give effect to the Environmental Management Plan for Cockburn Sound.

(Government of Western Australia 2005:1)

One ecological EV (ecosystem health) and three social EVs (fishing & aquaculture, recreation & aesthetics, and industrial water supply) were proposed in the draft EPP. The focus of the EPP was to be on both water and sediment quality within Cockburn Sound. These values and associated objectives were set by the EPA based on work it had done on the values and objectives for all of Perth’s coastal waters, which itself was subject to wide-ranging consultation (EPA 2000).

Table 15 below shows these EVs and EQOs in the final SEP. The EQCs are to act as benchmarks to assess whether the EQOs are being met and the EVs protected. They were to:

... provide clear and scientifically justifiable limits to the level of ecological change considered acceptable, and hence set the bounds within which we must operate to ensure that current and future activities are ecologically sustainable. (EPA 2000:7)

Two types of criteria that make up each EQC were proposed:

- Environmental Quality Guideline (EQG) — triggers that if exceeded require specific investigations be carried out to determine if the Environmental Values are at risk. Some management actions may be required; and
- Environmental Quality Standard (EQS) — additional triggers that if exceeded indicates that the EV has been compromised, and management action is required to address the exceedance.

The EQCs would prove to be the most contentious part of the policy making process and is discussed in detail in the following section on conflict and policy making. All of the versions of the EPP and SEP had mechanisms that were predominately command and control. The full version of the final SEP (Government of Western Australia 2005) is included as Appendix 6 for reference, and some of the most significant clauses are shown below to illustrate the command and control nature of the policy.

Table 15: Proposed EVs and EQOs Cockburn Sound (Source: Government of Western Australia 2005).

Value	Environmental Quality Objective
Ecological	
Ecosystem Health	The level of ecological protection to be maintained for ecosystem integrity is described in terms of structure (e.g. biodiversity, biomass and abundance of biota) and function (e.g. food chains and nutrient cycles). The level of ecological protection is set out in the EQC reference document at one of three levels – high, moderate or low.
Social	
Fishing & aquaculture	Maintenance of seafood for human consumption, such that seafood is safe for human consumption when collected or grown.
	Maintenance of aquaculture, such that water is of a suitable quality for aquaculture purposes.
Recreation & aesthetics	Maintenance of primary contact recreation, such that primary contact recreation (e.g. swimming) is safe.
	Maintenance of secondary contact recreation, such that secondary contact recreation (e.g. boating) is safe
	Maintenance of aesthetics, such that the aesthetic values are protected.
Industrial water supply	Maintenance of industrial water supply, such that water is of suitable quality for industrial water supply.

The use of the words “declare”, “protect” and “give effect to” in the policy purposes (see earlier) are strongly directive and typical of the command nature of many of the clauses. The control part of the policy relates to the setting of EVs, EQOs and the EQCs through reference to the following:

The environmental quality criteria —

- (a) are established in the *Environmental Quality Criteria Reference Document for Cockburn Sound (2003–2004)*, Environmental Protection Authority 2005 (as amended and published from time to time by the Environmental Protection Authority following public consultation); and
- (b) apply to the protected area through the decision schemes shown in Schedules 4 to 6. These are referred to in the table over.

(Government of Western Australia 2005:6)

The EQVs are the most significant references for on-going management of the Sound and the SEP gives no flexibility here: “The protection of the environmental values is to be achieved by the taking of management actions to meet the environmental quality criteria” (Government of Western Australia 2005:9). The SEP is also highly directive of what the CSMC is to do in implementing the EPP, for example:

(3) Where the Cockburn Sound Management Council becomes aware of an exceedance of an environmental quality standard —

- (a) the Cockburn Sound Management Council will report the exceedance to the Environmental Protection Authority and the Minister for the Environment as soon as practicable.

(Government of Western Australia 2005:8)

The SEP provides some minor elements of flexibility and adaptability to the CSMC in that it requires the CSMC to

... investigate, monitor, review, report and continually improve on the achievement of environmental objectives, criteria and targets where appropriate in accordance with the Environmental Management Plan and the Policy.

(Government of Western Australia 2005:10)

Other than this the SEP is highly prescriptive but makes no direct reference to the types of specific management mechanisms that should apply in the EMP, and the use of, for example, market mechanisms and adaptive management would be consistent with the SEP, provided those EOs are achieved.

The EMP

As a preliminary step in preparing the EMP, the CSMC commissioned a consultancy firm to write a report to establish the existing state of the Cockburn Sound environment (D.A. Lord

& Associates Pty Ltd and PPK Environmental & Infrastructure Pty Ltd 2001). This report formed the technical basis for the preparation of the EMP. The 2001 draft EMP contained the following five point action plan for the implementation of the EPP:

- Protecting the environmental values of Cockburn Sound;
- Facilitating multiple use of Cockburn Sound and its foreshore;
- Integrating management of the land and marine environments;
- Coordinating research and investigations; and
- Monitoring and reporting on performance.

The first part is to build on the EVs, EQOs and EQCs to be set in the EPP/SEP. The EMP proposed that the CSMC would be responsible for monitoring water quality, checking for compliance with the EQCs and coordinating any action for non-compliance. It proposed that where a guideline or standard is exceeded the CSMC would coordinate investigation into the cause. If a guideline is exceeded the CSMC would work with the relevant agency to assess the risk to Cockburn Sound the exceedance poses, and if the risk is high then the CSMC would work with that agency to identify and implement an appropriate management response. If a standard is exceeded and the source is a licensed premise, the CSMC would work with the relevant agency to ensure suitable management is implemented to reverse the exceedance and repair any damage as required. If the source is a diffuse land use then a cooperative response was proposed to ensure land use practices are improved (for example working with the horticulture industry to improve fertilizer usage).

For each EV, an interim report card was published (see Figure 9 for an example) showing four levels of management response: monitor only, investigate where a guideline is exceeded, action where standard is exceeded or research where the state of the Sound for that item is unknown. Each is then followed with some key recommendations for action.

The draft EMP went beyond the more narrowly focused draft EPP by addressing the management of multiple uses of the Sound and foreshore. Four uses were proposed:








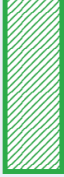



- Natural and cultural uses — terrestrial and marine habitats, and European and Indigenous heritage;
- Recreation and commercial — fishing, water activities, beach uses, aquaculture and nature-based tourism;
- Industrial — including ports; and
- Defence — recognising Stirling Naval Base.

Seven management areas were proposed (Figure 10) and relevant multiple uses identified for each (Figure 11). There were a number of recommendations made for each multiple use.

Figure 9: Interim report card in the draft EMP for ecosystem health in areas where a moderate level of protection is to apply (Source: CSMC 2001)

Interim Report Card 2001

Subject: Ecosystem Health in Areas of a Moderate Level of Protection (eastern foreshore)

Environmental Quality Indicators		*Management Response	Comments
Physical & Chemical Measures	<ul style="list-style-type: none"> Chlorophyll 'a' Light Attenuation 	 	Continue investigations and precautionary actions to address elevated chlorophyll 'a' levels (see Recommendations 8-12).
	<ul style="list-style-type: none"> Dissolved Oxygen Temperature 	 	Criteria for dissolved oxygen and temperature currently under review.
Indirect Biological Measures	<ul style="list-style-type: none"> Algal Growth Potential Periphyton 		Continue investigations and precautionary actions to reduce algal growth potential (see Recommendations 8-12).
Direct Biological Measures	<ul style="list-style-type: none"> Phytoplankton Blooms Chlorophyll 'a' 		Continue management actions to reduce nutrients, with priority on groundwater sources (see Recommendations 8-12).
	<ul style="list-style-type: none"> Seagrass Median shoot density Minimum shoot density 		Seagrass monitoring required along the eastern foreshore.
Toxicants in Water	<ul style="list-style-type: none"> Metals and Metalloids Non-metallic Inorganics Organics Pesticides Herbicides and Fungicides Surfactants Hydrocarbons Miscellaneous / Others 		For the range of water toxicants monitored to date, levels are either below ANZECC guidelines or below normal laboratory detection limits.
Toxicants in Sediments	<ul style="list-style-type: none"> Metals and Metalloids 		For the range of sediment toxicants monitored to date, levels are generally below ANZECC guidelines or below normal laboratory detection limits, apart from TBT levels in Jervoise and Careening Bays (see Rec. 5 and 6). Recent sampling indicates that mercury is present at a few isolated sites near jetties. Further testing, consistent with ANZECC/ARMACANZ 2000 guidelines and the proposed decision-trees in the EPP Reference Document, indicates that the guideline has not been breached.
	<ul style="list-style-type: none"> Organometallics (e.g. TBT) 		
	<ul style="list-style-type: none"> Organics 		

LEGEND

* Management Response:






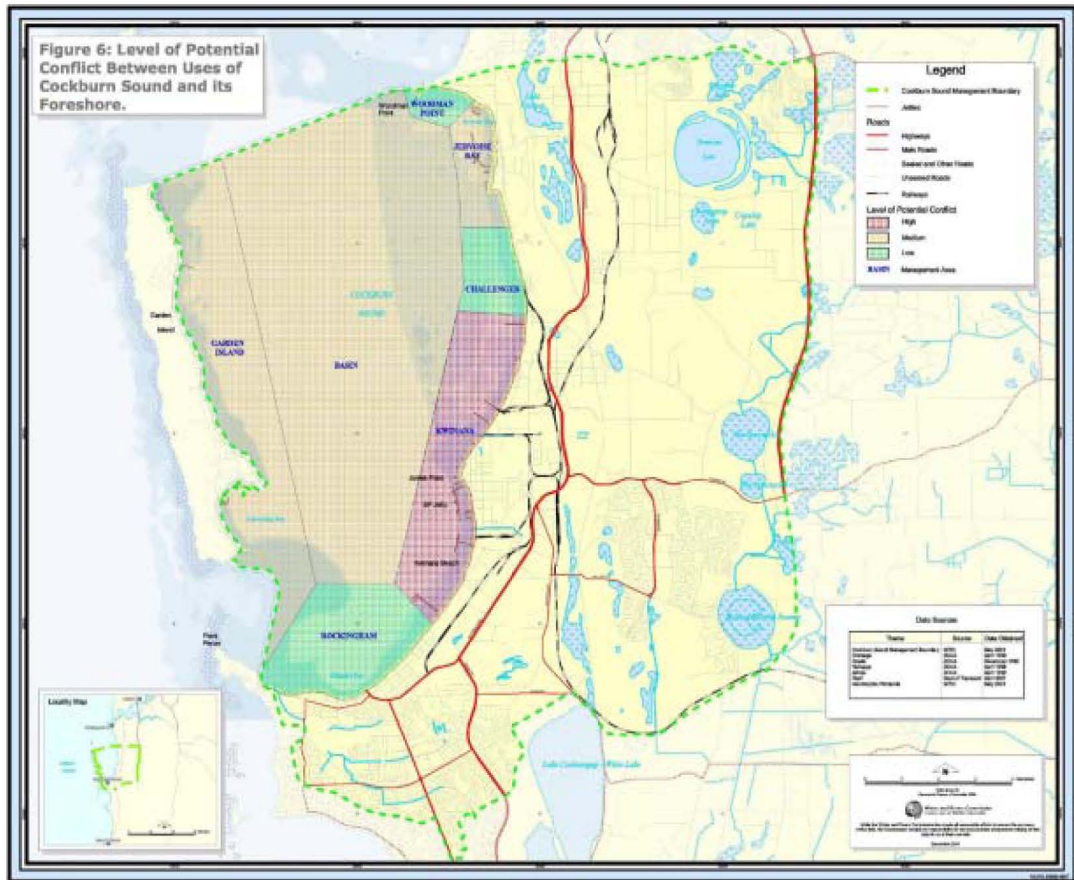
-  **Monitor** – Below guideline; continue monitoring.  – Below normal laboratory detection limits.
-  **Investigate** – Above guideline; investigate and, where necessary, take precautionary action.
-  **Action Required** – Above standard; initiate management response.
-  **Research** – Additional information required to establish state of the Sound and/or criteria.

Figure 10: The seven EMP management areas (Source: CSMC 2001)



The development of these multiple uses will be returned to later to illustrate the level of participation involved in the preparation of the EMP.

The draft EMP went on to make some recommendations for integrating management of the land catchment with management of the Sound, coordinating research, and monitoring and reporting on performance. It finished with a proposed format for an implementation strategy, to be completed for the final EMP.

Figure 11: Multiple uses proposed for each management area in the draft EMP (Source: CSMC 2001)

Table 9. Multiple Use Planning for Cockburn Sound and its Foreshores

Multiple Use	Management Areas							
	Garden Island	Rockingham	Kwinana	Challenger Beach / Cliffs	Jervoise Bay	Woodman Point	Central Basin	
Natural/Cultural	✓	✓	✓	✓✓ (Cliffs)	✓	✓✓	✓	
Recreational/Commercial	✓ ^R	✓✓	✓ ^R	✓✓ (Beach)	✓	✓	✓	
Industrial	✗	✗	✓✓	G	✓✓	✓	✓	
Defence	✓✓	N/A	N/A	N/A	✓	N/A	✓	

✓✓	Primary Use	<i>Priority use of a management area.</i>
✓	Secondary Use	<i>Use compatible with primary use and management area.</i>
✓ ^R	Restricted Use	<i>Use restricted within a management area by legal constraints.</i>
G	Gap in Knowledge	<i>Additional information required to assess compatibility with other uses and/or management area.</i>
✗	Incompatible	<i>Use incompatible with other uses and/or management area.</i>
N/A	Not Applicable	<i>Assessment of use is not relevant.</i>

The main issues raised in submissions on the draft were:

- Remediation of groundwater;
- The need for a social oral history;
- Public access to monitoring data;
- Strong support for independent monitoring and reporting;
- The boundary of Cockburn Sound should be extended to include Owen Anchorage;
- and
- The EMP should embrace a principle of no net loss.

The last matter created considerable debate within the CSMC and will be covered separately in the discussion on conflict and policy making in Cockburn Sound. The final EMP was released in 2005 with the key changes from the first draft being:

- Updated Report Cards (2004);
- The draft made reference to a principle of “no net loss of ecological or social functions in Cockburn Sound” for new developments, which was replaced in the final version with “Guidelines for Development Affecting the Shoreline and Seabed” (see discussion below);

- The recommendation in the draft that industry should ensure that marine fauna is not drawn into seawater intakes, or that if they are trapped they are removed before harm comes to them, was removed from the final EMP;
- The final EMP had the following additional recommendations –
 - a social and oral history be completed of Cockburn Sound,
 - industry be encouraged to develop best management practices for waste water discharges, and
 - remediation of contaminated sites be encouraged;
- A web-based system be developed to allow public easy access to monitoring data, report cards and related management strategies; and
- The implementation strategy was finalised including a description of the action, output, expected outcome, agency responsibility and timeframe for starting and completing the action.

The multiple uses allowed in each management area remained largely unchanged for the final EMP (see later discussion). The change to “no net loss of ecological or social functions in Cockburn Sound” is significant and discussed further below. The other changes can be considered minor, which suggests that the draft EMP was a very good representation of the existing community and agency views and concerns about the management of Cockburn Sound. This is reflected in debates that took place at the two community forums held during the public review period for both the draft EPP and EMP. The question and answer sessions were dominated by debate about the EPP and specific proposals affecting Cockburn Sound, with only one brief mention of the EMP. The most likely reason why the draft EMP required so few changes was the comprehensiveness of the participative process undertaken for its preparation, as discussed later.

The clauses in the EMP are a mixture of both command and control and adaptive. The EMP has many specific directives for action, for example:

14. Conduct site specific studies in the Mangles Bay and Kwinana area to determine sources of stress to seagrass meadows (CSMC, DoE, WRC, CoR, KIC: 2003 – 2005).

15. Specify mooring and anchorage types and locations which minimise seagrass damage.

(CSMC 2005:16)

This is typical of management plans where clear guidance to those actually managing and planning the Sound is required. The EMP (CSMC 2005) set a primarily cooperative process for its implementation:

In implementing the Plan, the Management Council will draw upon the skills, experience and legislative powers of its broad membership, which includes

representatives of the general community, recreation and conservation groups, industry, Defence and local, State and Commonwealth government agencies.

(CSMC 2005:5)

The key adaptive elements of the EMP relate to the implementation of the EQCs. The CSMC (2005) is to coordinate the monitoring of the EQCs, and compare the monitoring data against the EQCs to “determine if key biological, chemical and physical indicators are within limits” (P. 9). As mentioned earlier, where a guideline or standard is exceeded the CSMC would initiate an appropriate management response, especially where a standard is exceeded. Specific management actions are not included in the EMP and would be determined on a case by case basis depending on the extent of the exceedance and the nature of the source of the contamination. This, then, is the adaptive part of the EMP where the monitoring results determines the need for any action and, if so, what management response is needed.

Based on the model of adaptive management proposed in Chapter 2, the type of adaptive management used in Cockburn Sound is best described as passive adaptive where:

- There is an adequate and comprehensive amount of existing environmental data on Cockburn Sound (although it is important to note the earlier comments of the EPA in relation to uncertainty about the cumulative impacts of new proposals for the Sound);
- Actual modelling is not used, as the managers are of the view that Cockburn Sound is relatively well understood and there is a high level of confidence that the system will respond as predicted. There is limited expectation that management would need to change once implementation begins;
- Broad management options were drawn up and evaluated as part of the drafting of the EMP, and a preferred overall management approach agreed to, although the specific management actions where exceedances of EQCs are detected will be determined on a case by case basis;
- Monitoring is required, not because of any uncertainty over the likely impacts, but because the system is highly sensitive to change and has high environmental significance; and
- The level of conflict associated with Cockburn Sound is high (see later discussion), which is largely associated with issues of whether or not to proceed with the developments being considered for Cockburn Sound, and because the implications of failure of management are significant.

The fact that a comprehensive ecological model is not used as the basis for management decision making means that active adaptive management is not being used, which reflects the relative agreement about how Cockburn Sound operates as an ecosystem. The conflict

over the science was largely over what EQCs should be set, and not over how Cockburn Sound might respond to stress and change.

The nature and extent of conflict at Cockburn Sound

Cockburn Sound and resource scarcity

As noted in Chapter 2, conflict in environmental policy making emerges in situations of growing resource scarcity. It will be argued here that the most recent pressures on Cockburn Sound can be seen as a resource scarcity issue where Cockburn Sound (the marine water and the foreshore and beaches) can be seen as a useable resource, with the three resource scarcity issues identified in Chapter 2 present here: decreasing quantity of the resource (loss of some areas of Cockburn Sound for public use), increasing demand on a resource (growing number of users and competition for space) and loss of a good quality resource (mostly deteriorating water quality).

From the mid 1990s onwards, there were a number of new proposals that caused community concerns about the on-going management of Cockburn Sound, and the Sound's ability to continue to provide for the range of existing uses. Those proposed developments were:

- A new breakwater to provide sheltered waters for the Jervoise Bay ship building and marine support industries (1996);
- Short-term expansion to shellsand dredging in Owen Anchorage involving 3.7 million tonnes of shellsand over three years (1996);
- A significant expansion to Jervoise Bay ship building and marine support industries including significant land reclamation and additional breakwaters (1999);
- A long-term expansion of existing shellsands dredging in the Owen Anchorage involving 90 million tonnes of shellsand over about 35 years (2001);
- Stage 1 of a private port at James Point (2002); and
- A desalination plant to provide potable water for the Perth metropolitan area (2002).

As well as these formal proposals there were two other proposals that were in the later stages of planning but were yet to be formally proposed:

- A plan by the Fremantle Port Authority to construct a new harbour north of James Point to supplement the existing Fremantle port; and
- A new marina and associated residential and commercial developments at Mangles Bay.

As can be seen from Figure 7, over half of the foreshore and beach areas of the eastern shores of Cockburn Sound are within the industrial areas, and only the beaches in the south are readily available for public access. All of the beach areas within the northern industrial area (Jervoise Bay) have been removed to allow for shipbuilding infrastructure (see Plate 8), and many of the beaches in the Kwinana Industrial area cannot be easily accessed. Further, public access to the beaches adjacent to the larger industrial plants is discouraged because of concerns about public health and safety in the event of an accident (see Plates 10 and 11). This has not stopped people using these beaches for a range of uses, including fishing, horse and dog exercising and swimming.

An emerging problem is that many of these new developments will require land that is adjacent to the foreshore and beaches and, once constructed, would likely lead to a further loss of beaches that can be accessed by the public. The existing public foreshore and beaches in the south of Cockburn Sound are already heavily used and the removal of these industrial beaches will put added pressure on the non-industrial beaches. In effect, the beach resource in Cockburn Sound will become scarcer.

As well, these new and proposed developments compete with the existing users for the marine areas of Cockburn Sound. For example, many of these developments will bring increased boat and ship traffic to the Sound, increasing the risk of accidents between these larger vessels and the considerable recreational boating traffic. As one community representative of the CSMC noted:

There's the navigational issue. If shipping movements get too great in there, there will be some physical conflict, because people who use boats are not necessarily mariners. They don't know all the rules and that is actually one of the important factors I believe about Cockburn Sound and that is it is a training ground.

Reducing community access to areas of Cockburn Sound was a common theme raised by community members of the CSMC at their meetings. For example, at a CSMC meeting on 5 April 2002, a community member expressed anger over plans for a proposal to build a new port in Cockburn Sound which would include a boating exclusion zone not only within the port boundaries but also a buffer zone surrounding the proposed port, and that this would inevitably lead to the loss of recreational areas within the Sound. Another community member raised concerns that increased ship movements would likely lead to boating exclusion zones around the major shipping routes within the Sound.

Plate 8: The industrial area at Henderson in the north east corner of Cockburn Sound showing the reclaimed foreshore (Source: Garry Middle).



Plate 9: Kwinana Beach within the Kwinana industrial area (looking north) (Source: Garry Middle).



Plate 10: Sign at Wells Park adjacent to Kwinana beach, within the Kwinana industrial area (Source: Garry Middle).



On a similar theme, the southern public beaches are also subject to pressures, with a growing residential population, and increased tourism development adjacent to the foreshore bringing more visitors to the beaches (see Plate 11 showing new short-term apartment accommodation being built on the foreshore). By the late 1990s the EPA became concerned that the health of Cockburn Sound was further declining, and there was a significant potential for further incremental environmental loss with each of these new developments proposed for the Sound. To quote the EPA directly:

A series of such developments along the shallow margins of the Sound would clearly result in extensive habitat modification, and together, they may have the potential to affect water circulation, water quality and ecological function over a broader portion of Cockburn Sound ...

(EPA 1998:3)

The EPA was concerned that the natural habitat of Cockburn Sound would become both further degraded and scarcer. Reduced water quality would also have implications for other users of the Sound, including:

- It could reduce both the recreational and commercial fish take;

- Poor water quality, particularly involving environmental health aspects (bacteriological and viral) could lead to beach closures¹³; and
- Increased phytoplankton in the water (including full scale algal blooms) leading to reduced visibility affecting some of the tourism operations in the Sound (for example, swimming with the dolphins).

In summary, Cockburn Sound can be viewed as a scarce resource with some portions of the Sound being removed from the public domain (access to beaches), increasing competition (more users) for the existing space that is Cockburn Sound, and decreasing good quality resource (loss of environmental value and loss of water quality). As noted by one stakeholder

Whilst there have been some tensions between many of these different uses and interests, open conflict was minimal up until the mid 1990s, arguably because Cockburn Sound was not seen as a scarce resource and was able to provide adequately for these differing uses. The loss of seagrass was seen by many environmentalists and the EPA as a matter of concern, but Cockburn Sound was providing adequately for a range of human uses with many seeing the seagrass concerns as an inevitable outcome of increased social value of the Sound.

Plate 11: New short-term accommodation units on the foreshore of Rockingham beach, on the south-east shore of Cockburn Sound (Source: Garry Middle).



¹³ This occurred at Palm Beach during the data collection phase of this thesis (a beach to the south-east of the Sound within the Rockingham residential area).

Social conflict

Introduction

The following comments by two interviewees sum up the level of social conflict at work in Cockburn Sound.

The Sound as an entity or as a body of water, or coastal environment or whatever you want to call it, because there are so many competing issues or competing users or organisations that want to use it for so many different activities, there is bound to be conflict.

Because there are so many different interests in Cockburn Sound, each with their own objectives and agenda that realistically we could never set out to make everybody happy. It's just not going to happen, that's the reality of the situation. Unfortunately it's not a win, win, win situation; Cockburn Sound probably never could have been like that, and certainly the way it is now with industry and defences and ship building and commercial and recreational fishing and just general passive and active recreational activities, it can never be that way. There's always going to be winners and losers and there will be some people that are going to be losers and they won't be happy with their part.

As already noted, Cockburn Sound is the most intensively used marine embayment in WA and is subject to a diverse range of interests from ecological, commercial and recreational fishing, recreational boating, heavy industrial area, a backdrop for a rapidly growing coastal residential area and the home of an important Naval Base. Of course, the presence of this range of different values does not necessarily imply that conflict exists. The discussion below, drawing on the interviews, explores the extent of that conflict by focusing on four areas: the beach and public access; lack of trust towards industry in the Sound; a fundamental difference over what the long-term objective for the Sound should be; and differences of view over a no net loss principle for development in the Sound.

Beach and public access as a source of conflict

The EPA (1998) noted the significant community concern that future developments in Cockburn Sound could "further restrict access to beaches and coastal waters along the mainland coast of the Sound" (P. 3)

Here are the views of two community members of the CSMC in relation to beaches and access:

... and some people are angry because there won't be any beaches left in Cockburn Sound, so how do you fix and what do you do about that?

Beach access, yes, the primary one, but also boat access, and also access to parts of the Sound they want to get to. Certainly the community sees denial of access as

only exaggerating mistrust. If the access is there, even if it is not used, it will help the community to trust industry.

There is a view in both industry and government that reduced beach access is a simple reality as Cockburn Sound continues to develop. As noted by one industry person:

... and the biggest gripe from the community is that from Woodman Point to Kwinana Beach it's pretty much all going to be Industrial. Actually, that's pretty much the way it's going to turn out. There's not much that existing industry has had a role in: that's government policy. Those plans have been in place for a long time.

This suggests that there is recognition that reduced beach access is a source of conflict within Cockburn Sound. Interestingly, however, not all stakeholders recognised the importance of the issue for the community, as this exchange with one interviewee illustrates. The interviewee was exploring the five key issues from Cockburn Sound:

SUBJECT: I mean, everybody agrees on what the big five issues are. Everybody knows it is habitat loss, fishing pressure – what are the other ones?

GARRY MIDDLE: Beach access?

SUBJECT: No, not in Cockburn Sound. The big five for marine ecosystems in general, I'm pretty sure it is habitat loss, fishing pressure, eutrophication is one of them, contaminants inputs are another, introduced species, that's the other big one.

Whilst this lack of recognition of the beach access issue is a minority view amongst the key stakeholders, it does point out the on-going problem the community faces in having many of its concerns recognised by other stakeholders and policy makers.

A question of a lack of trust of industry in Cockburn Sound

The comments of the second community member in the previous section suggest that there is an underlying community mistrust of industry at Cockburn Sound. This is reflected in the following comments from an industry representative:

... a lot of the issues from the community groups were really issues that rise from a point of view that, "we don't trust the bastards." And so a lot of the issues that concerned the community people that were involved really came from a point of view of, "basically, we've got no trust, they said so many things over the years, it's never happened, we're outvoted, we haven't got enough representation.

The mistrust, for the most part, relates to industry being the primary cause of the loss of environmental quality in Cockburn Sound, mostly through the loss of seagrass and recorded spills and discharges into the Sound that have led to the closure of parts of the waters of Cockburn Sound. There is also a view of some recreational boat-owners and fishers that total fish take is reducing and that industry is the main cause of the declines by causing water quality problems. The following comments illustrate these concerns.

From an industry representative:

... but also take into account that there are a lot of people out there who will grizzle and say look at industry and raise the fist because they don't catch quite as many fish as they did 20 years ago.

From a government agency representative:

... but it's access to the foreshore and access to the water, because no doubt as the population grows and more people get boats it starts to get crowded out there. If you can get rid of BP and a few others then there's a little bit more water to be had. It doesn't mean you're going to catch any more fish, you actually catch less.

Conflict of the future vision for Cockburn Sound

The conflict over fishing and fish takes raises a significant and fundamental issue that is at the heart of the conflict over Cockburn Sound: conflicting visions as to what ecological state should Cockburn Sound be returned to in the long term. The following comments illustrate this:

I guess there are a few questions to ask. Is the seagrass actually able to recolonise? What time scale is that likely to occur? And the danger is that if you push the primary producers, which are now phytoplankton, too low your secondary production will suffer. And in my opinion, that is one of the key values that the community sees, is catching fish. You can go and swim anywhere, but they all want to catch fish in a sheltered waterway. It's not a prized area, really, for its swimming because there are plenty of magnificent swimming beaches. But what its real prize is that it is a sheltered waterway where you can get out there in a small boat.

The issue here is that the replacement of seagrass as the dominant primary producer has not necessarily reduced the net primary production of the Sound, with some experts expressing a view that it has actually increased. If this is the case then net secondary production (notably fish) should also have increased. The net result is that the species mix of marine fauna, especially fish, would have changed since 1954 (Hyndes 2004), but the sustainable catch of fish and other seafood may have increased as well. The implication for policy makers is that returning the Sound to water quality that favours the growth of seagrass rather than phytoplankton would achieve a conservation objective but could come at a cost to a social objective related to recreational and commercial fishing. Such an outcome would lead to further resource scarcity and an inevitably increased conflict.

These two differing objectives for the Sound are a source of conflict that has become central to policy making for Cockburn Sound, as reflected in these comments:

I think the opinion has been, certainly made public, that one of the objectives is to have the system in such a state that if the seagrass want to recolonise all that area

they can. Now, one of the questions is, “what is that magic number that would or wouldn’t allow the seagrass to recolonise?”

There are people around, in my opinion, that really no level of contamination, enrichment, eutrophication or whatever term that you want to use, is acceptable. There are some of them around the place who would prefer that it was 1954 again and the Sound is in that state.

The health of Cockburn Sound was raised at the annual community forums with some members of the community wanting the Sound returned to its conditions prior to the 1950s. A question from the floor asking why the impacts on Cockburn Sound cannot be reversed and why industry cannot be removed from the Sound received considerable applause at one meeting (meeting notes and observations from community forum held on 12 February 2002). This conflict over what the long-term environmental vision was particularly played out in the debate about EQCs, as discussed below, with those wanting a return to pre-development conditions pushing for tighter water quality criteria and industry wanting more relaxed criteria.

No net loss principle

Both the Consultative and draft EMPs made reference to a secondary principle¹⁴ of no net loss of ecological or social value. This issue was only discussed in passing at CSMC meetings prior to the release of the draft EMP, but was raised in some of the public submissions and created considerable debate at CSMC meetings following close of submissions. It is not clear why the matter went largely uncontested prior to consideration of public submissions, but a probable explanation was that members were focusing on the multiple uses part of the EMP (see later discussion).

The debate was triggered, in part, because of the EPA’s emerging policy on environmental offsets. This issue was first raised by the EPA in 1999 as an “overall environmental benefit” principle in relation to its policy on clearing of native vegetation (EPA 1999), which was modified two years later to include a wetland banking system (EPA 2001), and later developed as a broader offsets policy (EPA 2004, 2006, 2007).

The no net loss principle was meant to apply to new developments in Cockburn Sound that would inevitably cause a loss of environment quality, but could be approved subject to an off-setting benefit to the Sound. Examples could include the following:

- A proposal that would include some dredging and subsequent loss of seagrass could proceed if it funded seagrass rehabilitation in another area of the Sound (direct offset) or fund or carry out research into seagrass rehabilitation (contributing or indirect offset); and

¹⁴ Not one of the seven Principles referred to early on in the documents, but was labelled a ‘principle’ in the text i.e. “Ensure proponents of future development proposals are guided by the principle of no net loss of ecological or social function of Cockburn Sound.” (P16)

- A proposal that lead to a loss of beach could proceed subject to the proponent creating a new artificial beach as part of the proposal (direct offset) and doing rehabilitation and restoration works on a public beach subject to significant erosion (contributing offset).

The June 2002 CSMC meeting spent over an hour discussing the issue and of over two hours at its July meeting. It was the community members and those representing the NGOs who were most concerned about the EPA policy position and what the EMP might say about offsets. The following key issues were raised in those debates:

- Several members wanted the word net to be dropped and the principle should become a no more loss principle. Industry did not support this and believed they could operate within an offsets decision making environment.
- Concern was raised about how an appropriate offset could be defined and agreed to, as it would be difficult to actually get a like for like offset: for example what area of replanted seagrass should be required to offset the loss of an area of mature seagrass meadow?
- Should no net loss be interpreted as allowing a trade-off between the two values, for example could a loss of ecological value be offset by an increased social value?
- One view was that the principle needs to go beyond the general and be carefully and fully developed so that proponents of future developments cannot get around the intent of the principle by mis-interpreting it.
- An alternative view was that a detailed policy position could never be agreed upon and would waste a lot of the CSMC's time and energy so it was better to agree on some high level aims and allow case-by-case assessment.

After the second meeting, CSMC officers were asked to develop a draft set of Guidelines for achieving the no net loss principle, taking into account the issues raised in the discussions. A draft set of Guidelines was tabled at the September 2002 meeting (see Figure 12). The debate on these draft Guidelines was again lengthy and the community and NGO members reiterated their concerns raised at the previous meeting. In the end, an agreement was reached at that meeting. The notes I made from that meeting sum up the debate and final outcome succinctly:

Member 1 (*Conservation Council*) expressed concerns about no net loss. He doesn't want a trade-off thing but a no net loss thing i.e. it should not be that 9ha of bushland is lost to be offset by 9ha of degraded bushland within a regional park being rehabilitated – this is an environmental buy out. GK (*Chair*) did make it clear that CSMC was not a decision maker but provides advice, and that much progress has been made on this issue pushing some people's boundaries in CSMC but he recognized that it may not go as far as people like Phil would like to go.

The no net loss debate was an interesting test for the Council. There was a convergence of views between community members and industry/govt members about the issue in the end despite there being apparent differences at the start. Community members agreed and accepted impacts would occur if development did take place and that no loss was unreasonable. Industry/govt agreed that the CSMC needed a fairly high bar for this issue in the first place so that developers know they have to do a lot to get CSMC tick for it.

There was an obvious give and take from both sides of the debate which delivered the final agreement. As the debate unfolded, the members representing industry and government conceded that any offset had to be significant and meet a very high standard of accountability and transparency (the fairly high bar) which was met with the concession by the community and NGO members that it was unrealistic to expect a no loss outcome for development. This is an excellent example of social learning occurring, as referred to in Chapter 2 in the discussion on the collaborative policy making approach (see Poncelet 2001 for example).

As can be seen from Figure 12 and the resolution of the CSMC, the CSMC agreed to guidelines but allowed members to suggest some wording changes to staff and that, if on reflection and consultation with their groups or agencies, members found that the guidelines could not be supported, the matter could be raised again at the next meeting. A final draft EMP was presented to the November meeting with a slight re-worded set of Guidelines, and was accepted with only a minor change to the wording of the inside cover. The changes noted above relate to the multiple uses were also included. The final guidelines are shown in Figure 13 over the page. The final Guidelines have some differences compared to those agreed to at the November CSMC meeting, but they are insubstantial and minor wording changes, rather than changes to the intent of the Guidelines.

This issue created conflict at two levels. First, many community members opposed further development in the Sound in principle, and to discuss the idea of a no net loss principle was outright anathema — although in the end an agreement was reached. Second, because of the non-specific nature of the final Guidelines, there is likely to be considerable debate and likely conflict on a case-by-case basis as individual developments are discussed and what offsets should be required.

Figure 12: Copy of draft no net loss guidelines tabled at the September 2002 CSMC meeting.

DRAFT TEXT BOX

Guidelines for achieving no net loss of ecological or social values in Cockburn Sound

Guidelines that will be used by CSMC when providing advice on future developments :

- 1. Environmental impacts must be avoided where reasonably possible.**
- 2. Where this is not possible, offsets will be required which address those impacts on ecological or social values; without trading one value for another.**
- 3. Offsets must have the following characteristics:**
 - **Appropriate location:** preferably within the area affected, but must be within the management area.
 - **Enduring:** the off-set must be enduring and permanently offset the permanent impacts; temporary impacts must be rehabilitated as soon as practicable and offsets may be required during the period of the impact and beyond where management does not adequately mitigate the impacts.
 - **Targeted:** the offset should replace the loss of ecological or social values wherever possible on a like-for-like basis.

When providing comment on a proposal for development, the CSMC will consider:

- The extent to which the proposal includes measures that prevents and mitigates the environmental impacts of the development in order to achieve guideline No. 1.
- The offsets set out in the proposal and the extent to which they meet guidelines No. 2 and No. 3.

Unless the CSMC is satisfied that the guidelines are adequately met by the development proposal, the CSMC may be unable to support the development. In providing its advice, the Council recognises that defining suitable "off-sets" involves a degree of subjective judgement and may seek wide advice (including from the EPA) before coming to a view on the offsets contained in the proposal.

Resolution - 09CSM06/09/02
13/02

The CSMC

- 1. Agreed to the above wording subject to the Cockburn Sound Staff giving Members a final opportunity to provide comment on the wording.**
- 2. Provided Members were generally supportive of the amendments then the "No Net Loss" guidelines will be finalised for inclusion in the EPM, alternatively if further discussion is required, it will be discussed at the CSMC next Executive meeting.**

7

Summary

The above discussion illustrates that there was, and still is, considerable social conflict surrounding Cockburn Sound, with four significant examples discussed in detail: reducing beach access; significant community mistrust of industry; a fundamental difference over what the long term management vision for the Sound should be; and the no net loss principle. The next section examines the nature and extent of governance conflict.

Figure 13: Copy of final no net loss guidelines in the final EMP (Source: Cockburn Sound Management Council 2005:15).

COCKBURN SOUND MANAGEMENT COUNCIL

**GUIDELINES FOR DEVELOPMENTS
AFFECTING THE SHORELINE AND SEABED**

Guidelines that will be used by CSMC when providing advice on future developments :

1. Proponents should take all reasonable efforts to limit (minimise) the environmental impacts resulting from the proposed development.
2. If despite taking all reasonable efforts, significant impacts remain, offsets will be required which address those impacts on environmental values; without trade between ecological and social values.
3. Offsets should be:
 - **Appropriately located:** preferably within the area affected, but must be within the management area of the Council.
 - **Enduring:** the offset must be enduring in nature by permanently achieving a no net loss outcome in respect to permanent impacts, while temporary impacts must be rehabilitated as soon as practicable but within a defined period of time.
 - **Targeted:** the offset should replace the loss of ecological and/ or social value wherever possible on a like-for-like basis.

When providing comment on a proposal for development, the CSMC will consider:

- the extent to which the proposal includes measures that limit and mitigate the environmental impacts of the development in order to achieve guideline No. 1; and
- the offsets set out in the proposal and the extent to which they meet guidelines No. 2 and No. 3.

Unless the CSMC is satisfied that the guidelines are adequately met by the development proposal, the CSMC may be unable to support the development. In providing its advice, the Council recognises that defining suitable "offsets" involves a degree of subjective judgement and may seek wide advice (including from the EPA) before coming to a view on the offsets contained in the proposal.

Governance

Two areas of governance will be explored here: the historic arrangements and the governance proposed by the new decision making model (the EPP, EMP and the CSMC). Given that the health of Cockburn Sound deteriorated significantly from the 1950s to the early 1980s, it is reasonable to suggest that the environmental governance up until that time was unsatisfactory. Up until the mid 1980s the major industries that established on the shores of Cockburn Sound were controlled in large part by individual State Agreement Acts that gave little attention to environmental controls, although they were still subject to requirements of the existing legislation. These industries covered by State Agreement Acts were:

- Oil refinery — *Oil Refinery (Kwinana) Agreement Act 1952*;
- Steel production — *Broken Hill Proprietary Steel Industry Agreement Act 1952*, *Broken Hill Proprietary Company's Integrated Steel Works Agreement Act 1960*;
- The alumina refinery — *Alumina Refinery Agreement Act 1961* and *Alumina Refinery Agreements (Alcoa) Amendment Act 1987*;
- Nickel refinery — *Nickel Refinery (Western Mining Corporation Limited) Agreement Act 1968*;
- Cement works — *Cement Works (Cockburn Cement Limited) Agreement Act 1971*;
- Fertiliser and chemical works — *Industrial Lands (CSBP & Farmers Limited) Agreement Act 1976*.

The environmental management approach applied to these industries was to set restrictions on the concentrations of emissions that were discharged from the industrial plants through stacks (gaseous emissions) and outlet pipes into Cockburn Sound (for liquid waste) with no consideration given to total loads and impact on the receiving environment. Environmental controls involved end-of-pipe solutions rather than reducing emissions. Up until 1971, there was no overall environmental protection Act, with the various areas of environmental protection spread across various different Acts (for example, air quality was covered by the health Acts). In 1971, the first consolidated environment protection Act came into force, which allowed the environmental regulator to control discharges for the first time. The problem for regulators was the lack of science and understanding of the various environments which was the subject of significant discharges, in particular Cockburn Sound. What was missing according to the DEC (1979) was:

A set of guidelines to water quality objectives, properly developed and adopted, which define concentrations, load, or other characteristics for water quality parameters relevant to the protection of beneficial uses of the Sound.

(DCE 1979:25)

Put simply, there were no water quality standards set for Cockburn Sound and there was little if any control on what was being discharged into the Sound. As noted above, industries' discharges into Cockburn Sound reduced significantly during the 1980s, which was in response to an improved understanding of the Sound, a more active regulatory agency and more environmentally aware industries. Concerns about the governance in Cockburn Sound remain today. As one community representative of the CSMC noted:

Cockburn Sound is such a complex area. There are so many different departments and so many different laws that relate to it. And every department thinks that its stake is the most important one.

For the most part, stakeholders were supportive of the new overall approach to planning and managing the Sound, although concern was expressed that it had taken a long time to have these arrangements in place. Another community representative on the CSMC expressed these concerns:

I would be slightly embarrassed that it's taken this long to come up with some kind of mechanism or for them to suggest that there is a need to have some kind of coordinating entity which is, not so much safeguarding the environmental quality of Cockburn Sound, but is in a position to make recommendations to government as to the environmental state of Cockburn Sound, the activities that impact upon the environmental qualities of Cockburn Sound and what needs to be in place in order to manage, if you like, those competing climates. So, I think there may be a bit of an issue in terms of why hasn't it happened sooner, which they may take personally or they may not take personally, but that is the way I think I would be leaning if I was them.

Part of the concern is that many of the community stakeholders hold a view that the government held off putting these arrangements in place until after all the important development decisions had already been made. For example:

The critical time for the Cockburn Sound Management Council to have been formed would have been in the late 1970s. The fact that it hasn't been formed until the late 1990s into the 2000s, I think that a lot of the hard yards have already been done. It's (the CSMC) really there just to keep it on track.

There is a suggestion here that these new arrangements are tokenism and that with or without the EPP, EMP and the CSMC, Cockburn Sound would be managed in the same way.

The decision not to proceed with the EPP and to instead adopt a non-statutory SEP was of particular concern to the conservation movement. These concerns were raised as early as February 2002 at a community forum, and as peak conservation group, the Conservation Council of WA, reported at the time in its newsletter under the banner headline "State Environmental Policy on Cockburn Sound Lacks Teeth":

This is a vastly inferior document to the previously promised Environmental Protection Policy (EPP). It has none of the legal powers of an EPP.

It has been claimed that Drafting difficulties with the Cockburn Sound EPP ... meant that an alternative instrument was needed, one that is underpinned by the recently expanded powers of the *Environmental Protection Act*. The Council is seeking legal advice on the matter.

(Conservation Council of WA 2004:4)

As noted earlier, the community groups are considerably distrustful of industry and wanted a strong regulatory regime to ensure compliance with the agreed EQCs. The change to the SEP is seen by the conservation movement as a significant downgrading of the proposed regulatory regime, which suggests that conflict over governance issues will continue with the new decision making process.

Science and information — the contest over the EQCs

Setting the EVs and EQOs was relatively uncontentious, partly because much of the work had been done through the Perth Coastal Waters studies (EPA 2000), but also because the EVs and EQOs are narrative and descriptive rather than quantitative. The EQCs, on the other hand, are more prescriptive and are quantitative values that would have to be complied with had the EPP been finalised. In the event that a non-compliance with an EQC standard is detected, and had the EPA policy stayed as an EPP, it would have been mandatory for certain actions to be carried out. For example, an industry found to have caused the exceedance would have to carry out remedial actions to undo the exceedance. It is not surprising, therefore, that the EQCs became the main focus of debate and conflict during the policy making period for both policies, but most notably the EPP. As one stakeholder noted:

I think setting up the environmental quality objectives and the values was quite a good process. Quantifying it has been the problem because a lot of these levels for different pollutants and particularly the biological parameters have been very difficult to quantify because there just aren't any standards around. I think that has been one of the difficulties. It has been easy enough to identify what the objectives and values are that we want to protect or enhance, but then finding quantitative measures to be able to measure the achievements or otherwise has been a lot harder. How do you actually measure the success in maintaining the area as a fishing nursery for example, and what range of species do you have to look at, that sort of thing.

And another:

It's the criteria side that has been pretty blinkered.

It also explains why, once the decision was made to change the EPP into a non–statutory SEP, opposition from industry to the EQCs largely dissipated.

The debates around the EQCs began very early on in the process before a draft EPP was released. The EPA flagged the general approach it would take towards setting the EQCs in early briefings of the CSMC in late 2000, and many of the stakeholder groups expressed concerns about that approach. In response, the EPA and CSMC jointly organised a number of workshops in February 2001 to discuss some of the key technical issues associated with EQCs. These workshops mainly involved the key Cockburn Sound stakeholders, but independent scientists (including some from the CSIRO and the USA) were invited to provide input on the issues where there was disagreement. The debate continued during the four years it took to produce a final SEP.

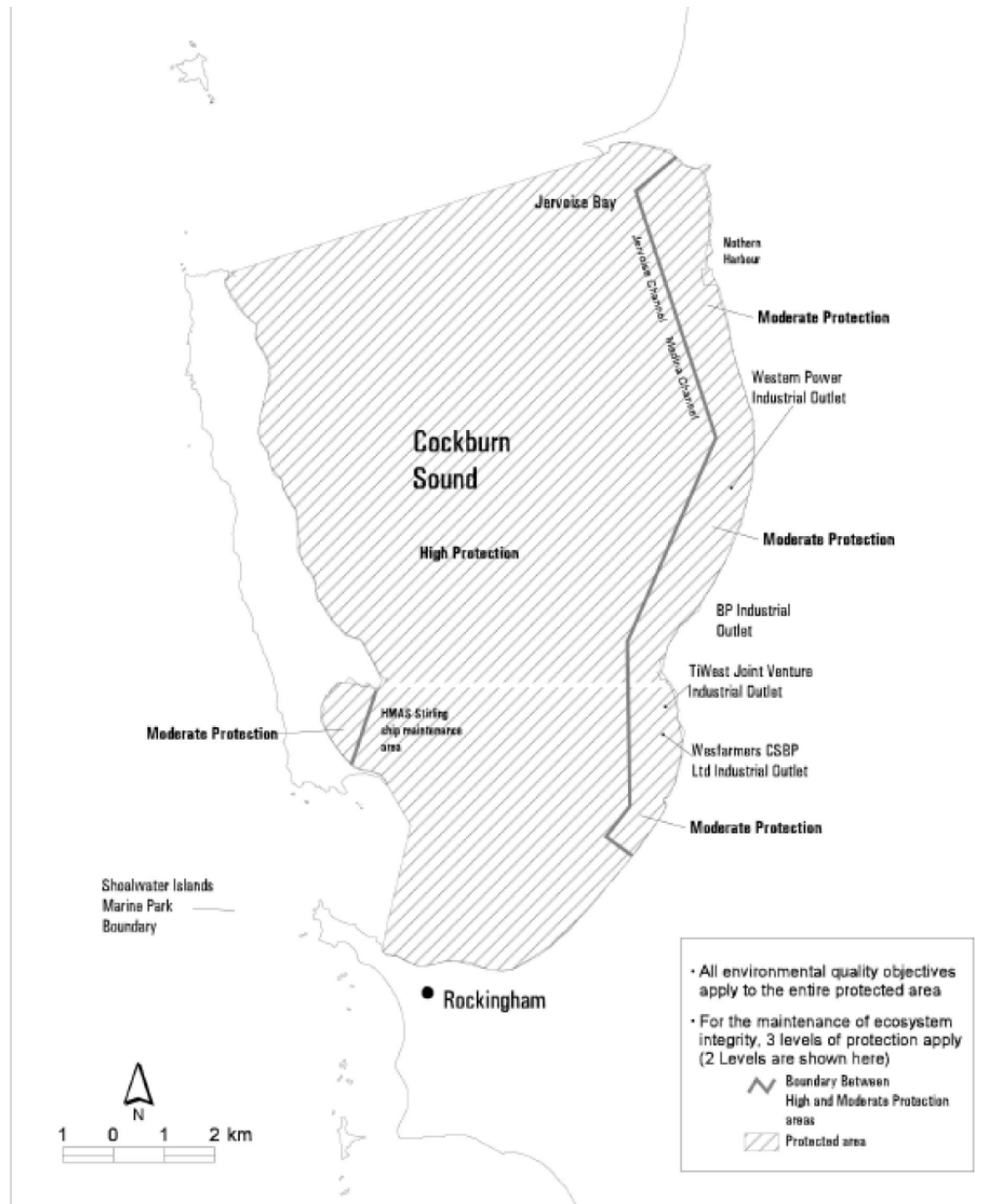
There were five inter–related elements to this debate, discussed in more detail below:

- The boundaries for the zones of protection;
- EQCs for potentially toxic substances;
- What should the reference site be for Cockburn Sound for nutrient levels;
- The *Chlorophyll a* guidelines for each zone; and
- The implications of a legally binding EPP and enforcement of EQCs.

The first four were clearly technical, but the debate over the legalities of the EPP was really the key driver of the debate. On the first of these elements, the draft EPP proposed that the waters of Cockburn Sound could be categorised into three levels of protection with different EQCs to apply — high, moderate and low. The EQC supporting document gave specific details of the proposed EQCs for both the high and moderate zones.

Figure 14 below shows the proposed boundaries between the high and moderate zones, with low zones around the point source discharges to be defined at some later time shown on the map. The degree of exemption given to the low zones from the criteria set for the moderate EQCs for social values, and the extent of the zones, were to be subject to case–by–case assessment.

Figure 14: Proposed high and moderate protection zones for the waters of Cockburn Sound in the 2001 draft EPP (Source EPA 2001).



Not surprisingly, the boundaries for the low protection zones were of particular interest to all stakeholders, especially industry. Industry wanted larger low protection zones to allow for a larger mixing zone for its discharges into the Sound. The Conservation Council of WA wanted the low protection zones restricted to 1% of the Sound (Siewert 2002), but some in the conservation movement wanted no low protection zones and for industry to treat effluent to at least moderate protection zone standards prior to discharge. Those concerned about beach access were concerned that low protection zones would be adjacent to some important beaches thus preventing swimming in those areas. Boat users, especially recreational fishers, and the aquaculture industry wanted to minimise the low protection zones to maximise the areas available for their use. As one stakeholder representing industry noted:

But even the mixing zones, that concept has caused some grief with some community activists. They just don't like the idea that there will be a contaminant coming out of the end of a pipe at concentrations above what might be acceptable for Cockburn Sound as a whole allowing for that, and they are pretty small mixing zones. So that's part of the EPP which has caused grief.

And, as one government agency (not environmental) representative noted:

The big area that we have talked about as a department in terms of changes to the policy has been the mixing zones, where we have said that we don't accept the way that the mixing zone process was done. We think that it should just be a simple case of accepting that if you put an effluent out, there has got to be a mixing zone and you manage that mixing zone. And the policy as it stands now actually can be anti-environmental because you could have a situation where it makes sense to put a pipeline out into the deeper waters of the Sound, and the way the policy is written now you can't. You have to put it in the near shore waters, which seems bit perverse.

Following consideration of the submissions on the draft EPP and supporting documents, the EPA made the following key changes to the EPP and EQC document in its 2002 revised draft EPP (EPA 2002):

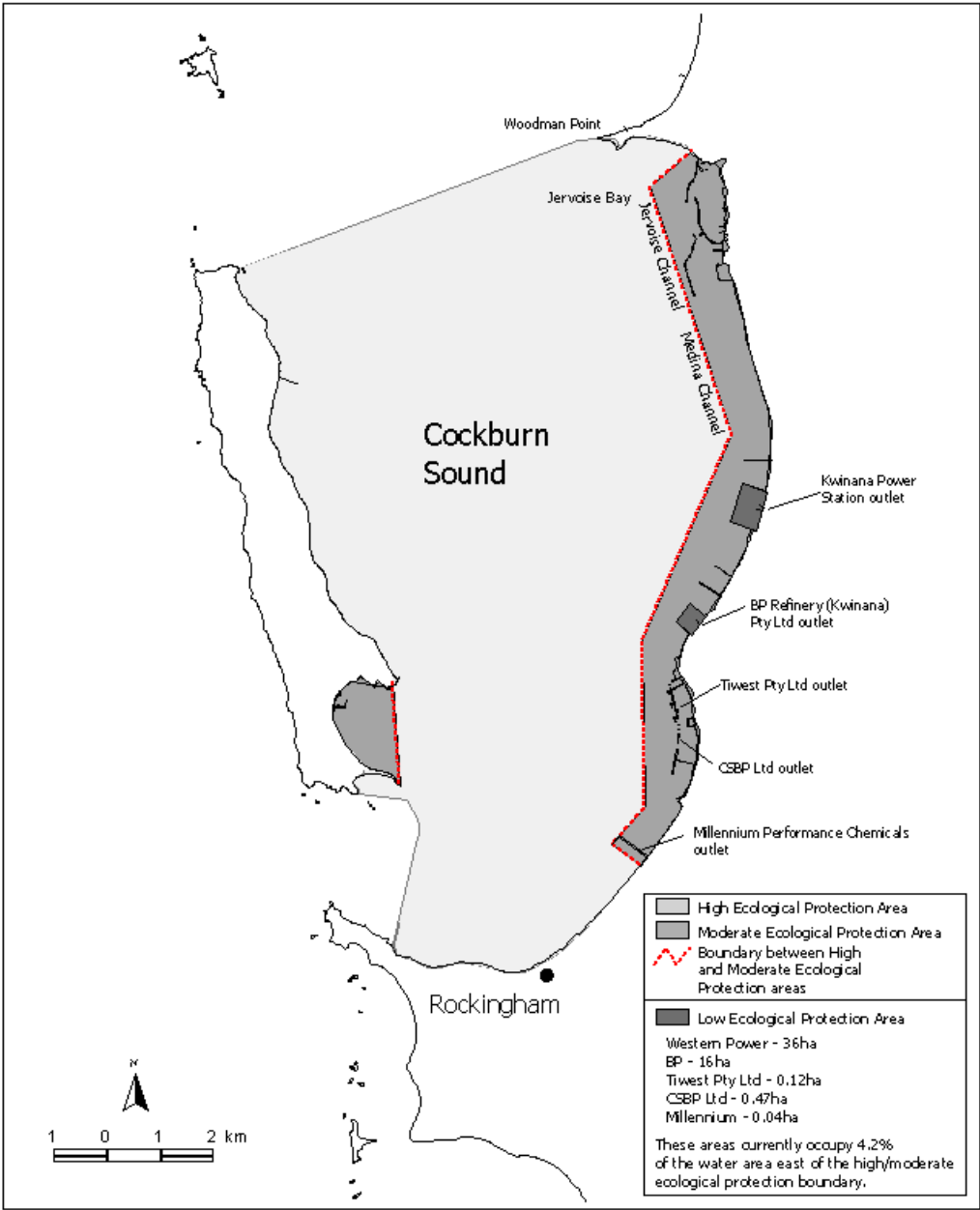
- The low Ecological Protection Areas were not specified but were to be limited to less than 5% of the total water area of Cockburn Sound. The exact boundaries were to be negotiated on a case-by-case basis;
- Case-by-case removal of certain social values in specific low Ecological Protection Areas; and
- Ports, harbours and marinas were to be categorised as a moderate protection area, although it was acknowledged that some EQCs could not be attained in these areas and variations from these EQC were to be assessed on a case-by-case basis.

The final SEP (Government of Western Australia 2005) identified five areas of Low Ecological Protection around discharge pipes, with a total area of 52.6 ha being only 4.2% of the total area of Cockburn Sound (see Figure 15). These Low Ecological Protection areas were to be reviewed by the EPA two years after the publishing of the SEP.

The second key element was the EQCs for potentially toxic substances. The key reference document for the EQCs was the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC and ARMCANZ 2000) published by Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ). The point of contention was what species protection values should apply — that is, what percentage of species would be expected to be protected given a certain level of a particular contaminant in the water. Four levels are proposed in the ANZECC and ARMCANZ Guidelines: 99%, 95%,

90% and 80%. The EPA originally proposed that the 99% should apply to all toxicants, whereas industry pushed for a combination of the 99% species protection values for substances with the potential to bioaccumulate and then 95% species protection values for the remaining contaminants. Not surprisingly, the EPA position was supported by the conservation and community groups.

Figure 15: High, moderate and low protection zones for the waters of Cockburn Sound in the final SEP for Cockburn Sound (Source: Government of Western Australia 2005)



Location, size and cumulative area of Authorised Low ecological protection areas in Cockburn Sound

After considerable debate, the SEP adopted the industry approach for guidelines for the potentially toxic substances, using a combination of the 99% and 95% species protection values rather than the DEC and conservation movement preferred 99% species protection values for all toxicants.

The third key element was where should the reference site for Cockburn Sound be — that is, what marine area should be considered to be the base–line target for water quality. The 2001 draft EPP proposed that the nearby Warnbro Sound be chosen. Opponents of this choice (mostly industry) pointed out that Warnbro Sound was mostly a Marine Park with a primary purpose of conservation and it was an unfair benchmark for Cockburn Sound, which could not be expected to ever reach these levels of nutrients because of the intense human uses of the water and surrounding catchment.

One of the scientists involved in the debate made the following comments on the use of Warnbro Sound as the reference site:

To this day I do not like it. I think it is completely inappropriate for water quality ... Water quality depends so much on flushing characteristics: it's pure physics. And to compare a completely open embayment and use that as your reference site to something that is really a semi–enclosed area, and to also apply guidelines derived from Warnbro Sound to semi–enclosed harbours within a semi enclosed embayment is just not appropriate ... To this day this position is causing on–going problems in managing the areas.

The community groups took a different view, wanting the water quality in Cockburn Sound to be returned to near pristine condition so as to facilitate the re–establishment of seagrass in the Sound. In the end, the final SEP kept Warnbro Sound as the reference site for Cockburn Sound.

The fourth key element was *Chlorophyll a* guidelines. The 2001 draft EPP proposed that the *Chlorophyll a* guidelines ($\mu\text{g L}^{-1}$) should be as follows:

- High protection – 0.802; and
- Moderate protection – 1.031.

Industry wanted 1.2 to apply to both the High and Moderate protection zones, whereas the conservation groups and Recfishwest (the peak recreational group in WA) supported the guidelines as proposed by the EPA (Recfishwest 2003).

The 2002 revised draft EPP proposed more relaxed *Chlorophyll a* guidelines of 0.9 for High protection zone and 1.2 for the Moderate protection zone. The *Chlorophyll a* guidelines in the final SEP were different again, reverting to 0.8 for the High protection zone but set an even more relaxed guideline for the Moderate protection zone of 1.3. The following comments from two of the stakeholders reflect the intensity of the debate over the *Chlorophyll a* guidelines:

There's been trenches dug too quickly with the EPP. The argument over the chlorophyll levels and the nitrogen targets in the EPP I really think is splitting hairs. You got a situation where the DEP people want 0.8. The industry people want 1.2 for chlorophyll because that's based on their understanding as to what's happening in Warnbro Sound. And then you got David Fox coming in and saying, "well, 1.0 is a pretty good number for these reasons based on Australia wide experience." The difference between 0.8 and 1.2 is 3/5 of 5/8 of a gnat's piss, when you think about it! When you talk about chlorophyll you're talking about the accuracy of the measurement and the spatial distribution of chlorophyll in a water body when you take samples. If I was in control I would have grabbed David Fox's 1.0 just like that and said, "that's what we'll go for", because there's a scientific basis for that which we all can agree to. But the DEP guys won't back off the 0.8, and so you got this standoff over that.

You've had industry looking at where they really find it unacceptable and so they get in a focus on the science of that bit. Chlorophyll is a good example. They wheeled in (a consultant) to demonstrate that 0.8 was a crock and it should be 1.2. They haven't really had a look at, if you like, the balance of the science across the whole EPP. They're just using it as a tool to get their own way.

The first stakeholder is clearly concerned that the debate over the *Chlorophyll a* guidelines is between duelling scientists, which, as noted in Chapter 2, can occur when the science is uncertain and, therefore, contested. The second stakeholder is concerned that industry, in pushing for the more relaxed 1.2 figure, had a particular agenda, notably, to allow discharge of nutrients at higher levels than would be allowed if the *Chlorophyll a* guideline was 0.8.

The final element was whether a statutory EPP could or should be legally drafted to provide protection for Cockburn Sound, and was touched on in the previous Governance section. This is directly related to the issue of science and the EQCs, as one stakeholder noted:

Yes I think that is one of the real challenges that's come out of this. It's identified the fact that the science is so lacking, and this is possibly the first time in WA at least if not in Australia we've tried such an ambitious type of EPP to measure the health of a marine ecosystem and to try to determine whether we are succeeding in maintaining or improving it. Scientifically it's quite challenging ... I guess, to some extent that is why the EPA and the Council step back from being too tough with the actual standards that they are setting because there is so much uncertainty in the standards and if you tried to take someone to Court and prosecute them for breaching a standard then it would be pretty hard for the government to prove in Court that that was a sensible standard or that it was based on good science at this stage.

As another stakeholder noted:

I think one of the problems the EPP is going to run into as well which I haven't mentioned yet in translating it into Crown law language. You've been involved in the process so you know what's happening now; they've only just got a workable draft now but I have heard that normally it takes 20 drafts to actually get something that everybody's happy with. And that's just the EPP, that's not the EQC reference document. They haven't even started on the EQC reference document and that's going to give the lawyers some extreme headaches. There are times when I even wonder if it's ever going to see the light of day.

The concern was that there are some significant implications for industry and government if the EQCs became legally enforceable through an EPP. First, the monitoring to date suggests that some of the EQCs were currently not being met and that the DEC would need to either tighten licences further or take action against industry irrespective of whether industries were complying with their licences. As one stakeholder noted of the nitrogen guideline:

You are aware for example that the national water quality management strategies marine guidelines are exceeded every winter completely naturally off Perth coastal waters for nitrogen, it's just dumb, that's the natural system giving signals, it's got nothing to do with anthropogenic influence, it's just because of algae and the composting of those in the surf zone, and nitrogen levels go through the bloody roof, it's all natural.

Second, there was concern that because there were so many potential contaminants requiring EQCs, considerable effort would go into monitoring to ensure compliance but some of these potential contaminants represent low risk to the Cockburn Sound environment. As one stakeholder noted:

Probably my biggest concern is that I can perceive there would be occasions where the standards would be exceeded and a great deal of management effort would have been expended trying to address them, possibly, when they are not real issues in the first place. Or, even if they are issues, probably not the key issues. I guess I perceive that a whole lot of money would be spent on things that are probably not the ones of primary importance.

This concern remained, and considerable debate over the next two years took place within the EPA and Government about how and when to use EPPs, whether one was appropriate to the protection of Cockburn Sound, and if not, what form should a policy take. The details of that debate and the associated legal technicalities are not relevant here.

A final concern was that the EPP would be constrained to dealing only with environmental matters and had limited scope to address broader socio-economic concerns. As noted

earlier, however, both the CSMC and the EMP would address these broader issues. The problem was that it was proposed to use the EPP to give legal standing to both the CSMC and the EMP, and advice emerged during the process that this could not be done.

In the end, because of these concerns about the legalities of the EPP, the EPA abandoned it in favour of a non-statutory SEP, and an alternative mechanism was used to give legal standing to the EMP and CSMC (through the *Water and Rivers Commission Act 1995*).

To sum up, the keys points of contention involving the EQCs were resolved in the SEP as follows:

- The 2001 draft EPP made reference to the need for some Low Ecological Protection Areas but did not identify any locations. The SEP showed the locations of five Low Ecological Protection Areas but the total area was below the 5% recommended in the 2002 draft EPP — a gain for industry.
- The 2001 draft EPP proposed that the 99% species protection value should apply to all toxicants, but the SEP used a combination of the 99% species protection values for substances with the potential to bioaccumulate and the 95% species protection values for the remaining contaminants — a gain for industry.
- The 2001 draft EPP proposed that the reference site for Cockburn Sound should be Warnbro Sound, and this was retained for the SEP — arguably a gain for the community and conservation groups but really represents a no change outcome.
- The 2001 draft EPP proposed that *Chlorophyll a* guidelines should be $0.802 \mu\text{g L}^{-1}$ in the High protection areas and 1.031 in the Moderate protection areas, whereas the SEP adopted 0.8 for the High protection area and 1.3 for the Moderate protection area — arguably a gain for the community, conservation groups and industry.
- In response to the legal concerns raised, the policy was changed from a statutory EPP to a non-statutory SEP — a clear gain for industry and a loss for the conservation movement and community groups.

On balance, it appears that industry did better out of the participation process on the EPP than did the community and conservation movement. The debate over the EQCs (the science) was both intense and lengthy and to some extent has not really been resolved. The implications for industry of the EQCs have been significantly reduced now because the final policy is non-statutory, but this has enhanced the concern of the community and environment groups that no matter how good the EQCs are, they are not legally binding.

Summary of conflict associated with Cockburn Sound policy making

The above discussion makes it clear that there is significant conflict associated with policy making for Cockburn Sound. The three resource scarcity issues identified in Chapter 2 are present with: the loss of some areas of Cockburn Sound for public use; increasing demand on resources with a growing number of users; and, competition for space and loss of good quality resource through the deterioration of water quality. There is still considerable social conflict surrounding Cockburn Sound, notably in regard to: reducing beach access; significant community mistrust of industry; a fundamental difference over what that long term management vision for the Sound should be; and the no net loss principle. There has been a history of contested and poor governance arrangements in the Sound leading to the environmental problems, and whilst the new governance arrangements are seen as an improvement, some concerns remain, notably the non–statutory nature of the SEP.

The science surrounding the draft EPP was fiercely contested, especially the EQCs, and whilst the change to a non–statutory SEP has relieved some of that conflict, the debate about what some of the EQCs should be remains.

The policy making approaches adopted

Introduction

In deciding the policy making approaches adopted for Cockburn Sound, the three key considerations are the descriptions of the two policies in the second section in this chapter, the level of participation achieved for each policy and the extent of any decision sharing that has occurred, which is described next.

EPP/SEP participation and decision sharing

The participation process the EPA applied for the development of the EPP was quite different from the other EPPs. Here, instead of drawing up a draft EPP for public review using the experts within the DEC and minimal external consultation, the EPA embarked on an extensive period of public consultation prior to the release of the first draft. As noted earlier, this involved discussions with the CSMC and holding a number of workshops to discuss some of the key technical issues associated with EQCs. During the four years it took to finalise the SEP, the EPA provided numerous briefings to the CSMC and the annual community forums.

It is likely, therefore, that the level of participation for the EPP/SEP is higher than the IAP2's (2007) Consult and is either Involve or Collaborate. The relevant parts of Table 2 of Chapter 2 summarising IAP2's spectrum are shown below showing three descriptors of the participation process.

Table 16: The portion of IAP2's participation spectrum summarising the Involve and Collaborate levels of participation (Source: International Association for Public Participation 2007).

Participation level	Aim of participation	Input into policy making	Follow up
Collaborate	Policy makers work directly with the public through a partnership approach to ensure that views are incorporated into all parts of the policy making process	Alternatives developed jointly with the policy makers and the views and recommendations of the public are included to the maximum extent possible	On-going involvement of the public. Where views and recommendations of the public are not included the reasons are clearly communicated to the public.
Involve	Work more directly and continuously with the public to ensure the views are understood and taken account of during the process. Policy makers and public work separately.	Participation happens much earlier in the policy making process and input used to help the policy makers develop options that reflect in part the views of the public. Final policy decision made by policy makers in isolation	Alternatives developed by the policy makers and interim decisions made that reflect the policy makers' understanding of community views.

On the first descriptor of participation level in Table 16, the Collaborate level of participation involves a partnership approach, and whilst the EPA engaged in a partnership with the CSMC, there were no partnerships with the stakeholders that make up the CSMC. In this case, the partnership approach was very limited. There is, however, clear evidence that the EPA committed to, and carried out, continuous engagement with the public and worked hard to understand and take into account the views of stakeholders through the process. This is evidenced by the key concessions given to some stakeholders involving the highly contested EQC issue, notably industry (level of species protection and low ecological protection areas), but did not give any ground on other key issues (the reference site and *Chlorophyll a* guidelines).

On the second descriptor, the EPA did not develop alternatives with stakeholders: instead it began the stakeholder engagement with a clear view about what the EQCs should be. The participation did, however, begin much earlier in the process than for other EPPs, and, consistent with the Involve level of participation, the final SEP was developed and agreed to by the EPA in isolation: it retained the sole discretion on the decision making for the final SEP prior to its final transmission to the Minister. One stakeholder summarised the process this way:

If you look at what's come out, and go back and look at the Southern Metropolitan Waters Study report, a lot of it was taken out to basically put into the EPP ... We were certainly allowed to comment on the numbers, but, as I said, the outcomes were pre-determined. There wasn't a blank piece of paper to start off with. What you need to come to the table with is a blank piece of paper and no baggage.

On the final descriptor, there is evidence that the EPA communicated its decisions to stakeholders throughout the process via attendance at CSMC meetings and public forums. The various drafts of the EPP/SEP reflected in part the EPA's understanding of stakeholders' views and concerns, which is typical of Involve level of participation.

In summary, the level of participation could not be described as Collaborate as partnerships were limited and policy alternatives were not initially developed jointly with the other stakeholders. The final SEP did, however, demonstrate that the EPA had taken into account stakeholders' views and there was on-going engagement with stakeholders throughout the process. On this basis, the level of participation was IAP2's (2007) Involve. Decision making for the SEP remained with the EPA and the Minister and was not shared with key stakeholders, not even the CSMC. This is consistent with the Involve level of participation.

EMP participation overview and key issues

The process of engaging the public in the preparation of the EMP was far more participative than the EPP/SEP in three ways. First, the CSMC is made up of individuals who represent various community and conservation groups as well as government agencies, whereas the EPA is made up of five individuals who are appointed by the government because of their expertise rather than because they represent an organisation or community group. Consequently, the CSMC has on-going two-way interaction between the board and the members' organisations, which are the key stakeholder groups for Cockburn Sound.

Second, the CSMC meetings were held in open sessions, although there was provision for a closed session for particularly sensitive matters. Interested members of the public could attend and track the progress of the EMP's development. The EPA meetings, on the other hand, were closed to the public. CSMC meetings also provided members of the public with the opportunity to find out about progress being made on the EPP and the CSMC received updates from the EPA at every meeting.

Finally, the overall process in developing the EMP had significant input from the members of the CSMC as well as the officers that support the CSMC, compared to the input of EPA members on the EPP/SEP. As the Acknowledgements section of the draft EMP noted:

This document was prepared by the Cockburn Sound Management Council. Members of the Management Council gathered information, identified the main issues and developed the objectives and recommendations.

(CSMC 2001:ii)

And, as one CSMC member noted:

We went through the Cockburn Sound Management Council, we had a couple of sub-groups, we went over and over and over it until we fine-tuned it.

The more hands off approach of the EPA was largely due to their higher work load and the need, therefore, to delegate the work to the officers of the DEC. The EPA, as the peak environmental agency, was involved in the development of several policies at this time as well as considering many major new proposals which were the subject of environmental assessment (EIA). The CSMC had as its chief focus for several years the development of the EMP and EPP.

It is evident that a more inclusive less expert-based process was used in the development of the EMP compared with the EPP/SEP. As well, the EMP was finalised well ahead of the EPP/SEP (late 2002), but the CSMC believed that it should not release the final EMP until the EPP/SEP was also finalised for pragmatic reasons. As one CSMC members noted in an interview in 2003:

Now we probably couldn't have done the EMP much quicker and we are in a position now where we ideally ... would be finalising it now and going out, but we can't finalise the EMP until the EPP is finalised. That hamstrings us a little bit but we have taken the approach, which I think is a pragmatic one, where we are putting out the, I forget what it's called but it has a prefix, the EMP. We were basically putting it out knowing that 95 percent of the EMP isn't going to be changed, no matter what the EPP is.

There were three issues of particular concern to many members which they wanted particular involvement in: managing the various multiple uses of Cockburn Sound; the principle of no net loss of ecological or social functions in Cockburn Sound; and the aesthetic criteria. The first two issues were addressed in detail by the members of the CSMC. The debate over the "no net loss" issue was covered earlier as an example of conflict. The debates and processes surrounding the multiple use issue are described in detail below as it provides a useful insight into the participation process for the EMP. The aesthetic criteria issue was addressed primarily through a specialist consultant and will not be discussed further here.

Participation in developing the EMP multiple uses

The officers supporting the CSMC began work on a draft EMP late in 2000 in consultation with officers of the EPA. The CSMC received its first briefing on progress at a meeting in December 2000. Managing potentially conflicting uses within the Sound was of particular concern to most CSMC members, so five working groups were established in early 2001, including CSMC members as well as officers, to work on the multiple use section of the EMP. The key task of the groups was to identify the multiple uses appropriate for each management area (see Figure 13). The working groups reported their findings to the April

meeting noting in particular where there was disagreement on whether a particular use should be allowed in a management area. These areas of disagreement were addressed at the next meeting in May, giving members the opportunity to consult with the agencies and groups they represented.

At the May meeting the officers presented an interim multiple uses table based on the outcomes of the working groups' deliberations — see Figure 16. This table dealt with the disagreements in two ways. First, in three cases, the CSMC formed a view that it had insufficient information to identify whether that multiple use should be allowed or not in an area and so these were marked in the table with a G. The decision on whether to allow that use or not was delayed until that information became available. The other approach was to give a multiple use a conditional approval by identifying it as a secondary use but include a 'c' indicating that level of use is conditional. What this really meant was that there was remaining disagreement between stakeholders about the level at which, if at all, that use should be allowed: for example, the Kwinana area (where the heavy industries are located) notes Recreation and Commercial as a conditional use because the industry groups would prefer the public not be allowed to use those beaches for public safety reasons, whereas the community were pushing for full access because these beaches are the closest ones to nearby residential areas.

The contents of the table were re-considered at the September meeting of the CSMC where officers presented a near complete version of the EMP titled a Consultative Draft (CSMC 2001). Two of the three areas where information gaps existed previously were resolved, and a minor change was made to some of the Defence Multiple Use, changing some of the Incompatible uses to Not Applicable (see Figure 17).

Figure 16: Copy of interim Multi Use and Management Areas Table for Cockburn Sound (Source: Minutes of the May Meeting of Executive of the CSMC).

Table 1: Multiple Use Planning for Cockburn Sound and its Foreshores – Existing Uses

		Management Areas							
		Garden Island	Point Peron	Rockingham	Kwinana	Challenger Beach/Cliffs	Jervoise Bay	Woodman Point	Cockburn Sound Basin
Multiple Use	Recreation and Commercial	✓ ^c	✓ ^c	✓✓	✓ ^c	✓✓	✓ ^c	✓ ^c	✓ ^c
	Natural and Cultural	✓	✓✓	✓	✓	✓	G	✓✓	G
	Industrial	✗	✗	✗	✓✓	G	✓✓	✓ ^c	✓
	Defence	✓✓	✓	✗	✗	✗	✗	✗	✓

- ✓✓ Primary Use
- ✓ Secondary Use
- ✓^c Conditional Use
- ✗ Incompatible or Not Applicable
- G Gap in knowledge

6

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The CSMC agreed to release the report for public comment subject to some minor changes. The key differences between the multiple uses tables of the consultative draft and the actual draft¹⁵ were:

- Cape Peron was removed as an area as it is outside the actual Cockburn Sound basin (to the west of the causeway);
- The Conditional uses have been dropped reflecting agreement of the CSMC of all these uses;
- Challenger Cliffs had Natural and Cultural use elevated from Secondary to Primary uses; and
- A new code was introduced for the Secondary uses for Recreational and Commercial within Garden Island and Kwinana industrial area where legal constraints apply to those uses.

The third change has a particular victory for the conservation movement and reflected the changed status of the area and inclusion into a conservation park (see Plate 12). The officers briefing note attached to the report recommended that:

¹⁵ Figure 13 shows the version of the table in the draft EMP.

It is proposed to establish a “working group” of the Council to deal with any issues that may arise from the September meeting or subsequent written comments. The “working group” would ultimately be responsible for the endorsement of the “Consultative Draft” Environmental Management Plan.

Figure 18 shows is a copy of the multiple use table from the final EMP which is unchanged from the table in the draft EMP (see Figure 11 earlier in this chapter).

Figure 17: Multi Use and Management Areas Table from “Consultative Draft” of the EMP (Source: CSMC 2001)

Table 8: Multiple Use Planning for Cockburn Sound and its Foreshores.

Multiple Use (See Table 1)	Management Areas							
	Garden Island	Point Peron	Rockingham	Kwinana	Challenger Beach/Cliffs	Jervoise Bay	Woodman Point	Central Basin
Recreational / Commercial	✓ ^c	✓ ^c	✓✓	✓ ^c	✓✓	✓ ^c	✓ ^c	✓ ^c
Natural / Cultural	✓	✓✓	✓	✓	✓	✓	✓✓	✓
Industrial	✗	✗	✗	✓✓	G	✓✓	✓ ^c	✓
Defence	✓✓	✓	N/A	N/A	N/A	✓	N/A	✓

✓✓	Primary Use	✗	Incompatible
✓	Secondary Use	G	Gap in knowledge
✓ ^c	Conditional Use	N/A	Not Applicable

Plate 12: Challenger Beach Cliffs with the Kwinana Industrial area in the background (looking south) (Source: Garry Middle).



Figure 18: Copy of Multi use and Management areas Table for Cockburn Sound from the final EMP (Source: CSMC 2005)

Table 9. Multiple Use Planning for Cockburn Sound and its Foreshores

Multiple Use	Management Areas						
	Garden Island	Rockingham	Kwinana	Challenger Beach /Cliffs	Jervoise Bay	Woodman Point	Central Basin
Natural/Cultural	✓	✓	✓	✓✓ (Cliffs)	✓	✓✓	✓
Recreational/Commercial	✓ ^R	✓✓	✓ ^R	✓✓ (Beach)	✓	✓	✓
Industrial	×	×	✓✓	G	✓✓	✓	✓
Defence	✓✓	N/A	N/A	N/A	✓	N/A	✓

✓✓	Primary Use	<i>Priority use of a management area.</i>
✓	Secondary Use	<i>Use compatible with primary use and management area.</i>
✓ ^R	Restricted Use	<i>Use restricted within a management area by legal constraints.</i>
G	Gap in Knowledge	<i>Additional information required to assess compatibility with other uses and/or management area.</i>
×	Incompatible	<i>Use incompatible with other uses and/or management area.</i>
N/A	Not Applicable	<i>Assessment of use is not relevant.</i>

Summing up — level of participation and decision sharing achieved with the EMP

Taken at face value, the process undertaken by the CSMC in developing the EMP could be seen as IAP2's (2007) Consult level. Table 17 shows the relevant row of Table 2 in Chapter 2 where IAP2's full spectrum is described. The CSMC did no formal external consultation in developing the draft EMP, prior to its release for public comment. The public was kept up to date on progress being made on the EMP through the forums, and only limited changes were made following the public comment period. This would, however, be a simplistic and inaccurate assessment of the actual level of participation.

Table 17: The portion of IAP2's participation spectrum summarising the Consult level of participation (Source: International Association for Public Participation 2007).

Participation level	Aim of participation	Input into policy making	Follow up
Consult	The policy makers seek feedback from the public on current analysis, alternatives or interim decisions already made before a final decision is made.	This process commences once some work has been done towards developing a policy especially policy options, and a preferred option is usually put forward. Views on the options will be considered and there is some flexibility to incorporate limited changes to the preferred option.	The public is kept up-to date on progress being made, and some effort is made to accommodate the views expressed by the public before final decision.

As noted earlier, the composition of the CSMC and the meeting process provided considerable opportunity for the key stakeholder groups to provide input into the development of the draft EMP. The establishment of the working groups developing the multiple uses, and the extensive discussion and ultimate agreement reached on the no net loss Guidelines reflects the level of participation by these groups. The extent of participation can accurately be called *implied* shared decision making, as described in Chapter 2. The fact that few changes were made to the draft EMP reflects the level of agreement reached through the drafting process between the stakeholders.

The process followed for the development of the multiple uses demonstrates that on a key issue, the stakeholders were involved in the development of alternatives prior to reaching agreement on the final table of multiple uses. As I observed the Chairman saying at the June 2002 CSMC meeting:

It's not our plan, it's the community's plan.

A possible concern could be that this participation process only involves the peak NGOs and would be, in fact, a corporatist approach to participation typical of ecological modern

policy making. There are two reasons why this conclusion is invalid. First, two of the members the CSMC are selected from the broader Cockburn Sound community and do not represent stakeholder groups. Secondly, the key issues raised by the community during the review period were either already of concern to the members, or were given considerable attention by the CSMC prior to finalising the EMP: for example, the no net loss issue and the need for a social oral history. Clearly, the way the members interacted with their groups and agencies, and the responses to issues raised in the forums and public submissions reflected a highly participative rather than a corporatist approach.

Based on the three descriptors of participation levels in Table 16 for the Collaborate level:

- Because the keys stakeholders were represented on the Council feed back to those groups and the community was ensured. This meant that the CSMC worked directly with the public through a partnership approach. In this way, the views of the stakeholders were incorporated into the EMP;
- Specific policy alternatives were developed jointly with the stakeholders and the views and recommendations of the public are included to the maximum extent possible, as the example of the multiple uses illustrates; and
- There was on-going involvement of, and communications with, the public throughout the process.

To sum up, the level of participation for the EMP was more typical of IAP2's (2007) Collaborate level where decision making is shared with the stakeholder groups.

Conclusion about the policy making approaches adopted

The policy mechanisms of the EPP/SEP are predominately highly prescriptive command and control measures with a level of participation best described as Involve, which is the highest level of participation achieved for any EPP. So whilst policy making is a reasonably participative approach involving significant early involvement of key stakeholders, in the end it must be seen as largely a traditional expert-driven policy approach, but with a much improved level of participation.

The policy making approach of the EMP is clearly more participative than the EPP/SEP and it is fair to conclude that it is collaborative in its overall approach. As described earlier, the policy mechanisms used in the EMP were a mixture of command and control and adaptive (passive), but the most significant and politically sensitive measures are those that related to the EQCs, which are adaptive. In summary, the policy making approach adopted for the EMP should be considered adaptive-collaborative.

It should be noted that in Chapter 5 in the discussion on the Swan Canning EPP and *Riverplan* it was argued that EPP and *Riverplan* should be seen as a policy package

because they are complementary and that implementation is dependent on both policies working together. Consistent with this argument, the Cockburn Sound SEP and EMP should also be considered as a policy package. Further, taking into account that the EPA policy ended up in a non-statutory form thus reducing its significance, and that the EMP has become the chief focus on the policy implementation phase, it is considered that the overall policy making approach for the package is dominated by the EMP, which makes the whole package predominantly an adaptive–collaborative approach.

It is worth noting that little emphasis is given by stakeholders to the adaptive part of the policy package and most of the focus is on the collaborative part. In the interviews, when asked to comment on the policy making approach adopted, only one stakeholder made reference to the adaptive component and all stakeholders made clear reference to the collaborative nature of the policy and policy making process. This is probably because passive adaptive approaches are used in cases where conflict over the science, whilst present, is not significant, and the problem is not seen as wicked. This is also aided because the overall policy is no longer statutory, transferring the conflict over the science to conflict over governance (i.e. compliance with the EQCs cannot be mandated and can only be achieved through cooperative actions). The significance of both social and governance conflicts means the focus for stakeholders will be on the collaborative components to address these conflicts.

Policy making evaluation

Introduction

Chapter 4 proposes four broad policy evaluation criteria:

- Policy–making performance;
- Political support;
- Content relevance; and
- Other socio–economic impacts.

The policy–making performance criterion recognises three types of policies: simple limited scoped policies that have been finalised where measurable environmental change would be expected in a short timeframe; more complex finalised policies where environmental improvement could only be expected in the medium to long term; and draft policies. It was proposed to use different measures of performance effectiveness depending on the type of policy, as follows:

- For simple limited scoped policies that have been finalised with simple implementation measures — quantitative environmental improvement consistent with the policy objectives will be used, and
- For complex policies, with long time frames for implementation and/or complex implementation mechanisms, and draft policies — downstream decision making is consistent with policy.

Based on the discussions above, the two policies for Cockburn Sound are highly complex with long time frames for implementation, and it is appropriate, therefore, to apply the latter performance effectiveness criterion. There will, however, be a discussion of the data available on the health of the Sound, given that a significant part of its management involves comprehensive on-going monitoring and annual reporting. This discussion will demonstrate the point made in Chapter 4 about the difficulty in achieving short-term environmental improvements in these circumstances.

In summary, the data used for evaluation include the following:

- For policy-making performance the subsequent decision making of the relevant agencies is examined for consistency with the policies;
- For political support length of time to finalise the policy is a consideration as well as documented opposition from key stakeholders, primarily during the policy making process but also as part of any implementation. As well, the views of the interviewees are also considered as they can all be considered key stakeholders;
- For content relevance the key considerations are the extent to which the policies required changes to their content during policy development, and the extent to which the content was criticised, especially, but not limited to, by the interviewees; and
- For other socio-economic impacts documented socio-economic impacts as well as the views of the interviewees.

Consistent with the position taken in the last section that both policies should be seen as a package, the policy making will be evaluated as a package. As noted by one stakeholder:

Look I think overall the EMP is probably better, but I don't think that one could exist without the other.

It is worth noting, however, that stakeholders held different views about the two policies, and each had different levels of political support. Some stakeholders had different views about the content relevance of each and there was greater concern raised about the socio-economic impacts of the then draft EPP than the EMP. As summed up by one stakeholder:

... I think the EMP could easily be successful. The EPP, we'll wait and see.

Consequently, whilst the evaluation will be of the two policies as a package, the differences of the two on each criterion will be noted as part of the discussion.

Policy–making performance

Measurable environmental change

The CSMC publishes the annual State of Cockburn Sound reports, and the most recent one makes the following conclusion:

Based on the best available information, expert advice and the analysis of 13 monitoring programs in 2006–07 we can report that there has been no significant deterioration in the overall health of Cockburn Sound since monitoring began in 2000. The CSMC’s initiation, coordination and management of remedial or preventative action have contributed to the continuing health of the Sound.

(CSMC 2007:3)

This conclusion raises two questions: does “there has been no significant deterioration” mean that there has been some deterioration; and does “the continuing health of the Sound” mean that the Sound is overall healthy? On the first question, Table 18 shows the exceedance of both EQC guidelines and standards for both the 2007 and 2005 State of Cockburn Sound reports. It should be noted that Table 18 only shows the EQCs where either a guideline or standard was exceeded in at least one of the two years covered. Of the 78 EQCs reported on for Cockburn Sound, only 15 had any exceedance.

Of the EQCs where a conclusion can be drawn¹⁶, six showed no change, two showed improvement and three showed deterioration. Taken on face value, it could be argued that overall there was a net deterioration in Cockburn Sound between 2005 and 2007; however, this requires some careful analysis. Of the three EQCs that showed deterioration, two of these were about TBT in three small areas outside of Jervoise Bay, all within the moderate protection zones (see Figure 19).

One of the key areas where improvement had been detected was in seagrass shoot density in the broader high protection area. Given the significance of seagrass to Cockburn Sound and the relatively localised areas where TBT was found to be a problem, the improvement in seagrass density far outweighs the problems with TBT. The conclusion of the 2007 report (CSMC 2007) that there has been no significant deterioration in the overall health of Cockburn Sound seems reasonable, then, and it also points out the difficulty of making these judgements when dealing with a large number of environmental indicators of ecosystem health and a relatively short time frame since policy implementation.

¹⁶ There were no data on 5 EQCs in one of the years referred to in Table 18.

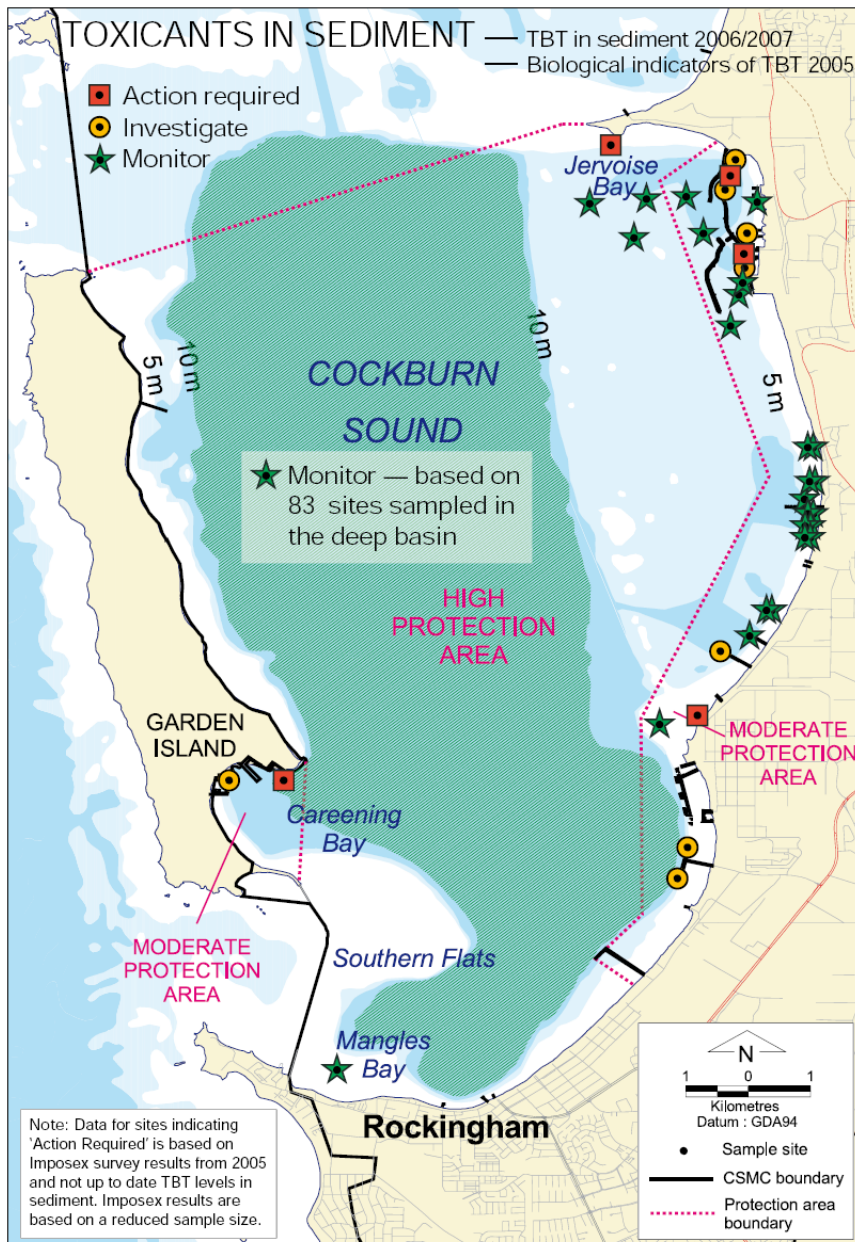
Table 18: Comparing exceedances of the EQC for Cockburn Sound for 2005 & 2007

EQC	Exceeded 2005	Exceeded 2007	Change
Ecosystem Health in Areas of a High Level of Protection (Broader area of Cockburn Sound)			
Seagrass Shoot density	Guideline	No exceedance – below Guideline	Improved
Organometallics (TBT)	No data – research needed	Standard	No conclusion can be drawn
Ecosystem Health in Areas of a Moderate Level of Protection outside Jervoise Bay Harbours			
Organometallics (TBT) in sediment	No exceedance – below Guideline	Guideline	Deteriorated
Organometallics (TBT) in snails	No exceedance – below Guideline	Standard	Deteriorated
Ecosystem Health in Areas of a Moderate Level of Protection at Jervoise Bay Harbours			
Chlorophyll 'a' – physical and chemical measure – north harbour	Guideline	Guideline	No change
Light Attenuation – physical and chemical measure – north harbour	Guideline	No data – research needed	No conclusion can be drawn
Light Attenuation – physical and chemical measure – south harbour	Guideline	No data – research needed	No conclusion can be drawn
Phytoplankton Biomass (Activity) – Chlorophyll 'a' – north harbour	Standard	Standard	No change
Organometallics (e.g. TBT) in sediment – north harbour	Guideline	Guideline	No change
Organometallics (e.g. TBT) in sediment – south harbour	Guideline	Guideline	No change
Organometallics (e.g. TBT) in snails – north harbour	Not reported	Standard	No conclusion can be drawn
Organometallics (e.g. TBT) in snails – south harbour	Not reported	Standard	No conclusion can be drawn
Safe Seafood for Eating			
Thermotolerant faecal coliform levels in water	Guideline	Standard	Deteriorated
Algal Biotoxins	Guideline	Guideline	No change
Clean Waters for Swimming and Boating			
Bacterial Enterococci	Standard	Guideline	Improved

On the second question, given that only 16 of the 78 EQCs reported on had any exceedance, the conclusion of the 2007 report that the Sound continues to be healthy

seems to be supported. Based on these monitoring data, it would not be possible to draw any conclusions within this small timeframe as to whether these policies had actually had any measurable effect on Cockburn Sound as a whole. Further, as noted in Chapter 3 (methodology) when discussing the use of effectiveness in highly complex contexts, both from an ecological perspective and a policy/political one, questions like “Would improvement have occurred if the policy had not been implemented?” need to be considered. This is particularly relevant here because as noted earlier in this chapter, some progress had been made prior to the establishment of the CSMC in better regulation of industry and a significant reduction of the amount of nutrient entering the Sound had already occurred.

Figure 19: Locations in Cockburn Sound where the EQC for TBT deteriorated between 2005 and 2007 (moderate protection zone) (Source: CSMC 2007)



Policy making performance – downstream decision making

There have been some significant achievements in relation to downstream decision making related to the EMP and SEP. First, one of the recommendations of the draft EMP was that the three affected local governments each develop a local land use policy to apply to the catchment. Work began on this in 2000, but a formal joint working group was not established in 2002, and little progress was made until 2003 when the CSMC took a more active role. It was proposed that these local governments work cooperatively to develop a single policy that would then be endorsed separately by each Council. The first step was the signing of a memorandum of understanding (MOU) between the three Councils agreeing to develop a single policy document. The MOU was formally agreed in August 2003 with a final local policy endorsed by all three Councils in August 2004 (CSMC et al. 2004). The policy applies to all new and changes to land use within the Cockburn Sound catchment that has the potential to export nutrients to the Sound. The policy identifies a range of land use with the potential to export nutrient, sets management requirements for that land use and has recommended land use controls (conditions of approval)¹⁷.

Another matter relates to the exceedance for bacterial Enterococci EQC in 2005 at Rockingham and Palm beaches. In response to a direct request from the CSMC, the State Department of Health and the City of Rockingham undertook a survey to identify the likely sources of this contamination. Two initiatives followed. First the two agencies agreed to combine and coordinate their beach monitoring programs, to provide better and more effective coverage of possible trouble spots. Second, the City of Rockingham spent \$150,000 in 2006–07 to improve stormwater management in the sub-catchments that were the likely sources of this contamination by reducing direct outflows of stormwater to the Sound (see Plate 13).

A third decision making initiative related to unregulated boat moorings in Cockburn Sound. There are many boats moored in the shallow and protected waters of Cockburn Sound, notable Mangles Bay in the south east of Cockburn Sound, with many of these located over remaining seagrass meadows. The anchors can scrape across the seabed removing seagrass (see Plates 14 and 15).

In 2005, consistent with the EMP, officers of the CSMC began working with the Department for Planning and Infrastructure (DPI) to introduce controls on mooring in these sensitive areas. On 17 August 2007 the Minister for Planning and Infrastructure declared Cockburn Sound a Mooring Control Area which included a temporary ban on new moorings in the Mangles Bay area. Existing moorings are now better regulated to improve the standard of moorings so as to reduce the impact on seagrass.

¹⁷ It should be noted that as part of the more active role of the CSMC in the development of this policy, I was asked to be involved in the process and the working party meetings to facilitate a cooperative approach to the development of the policy.

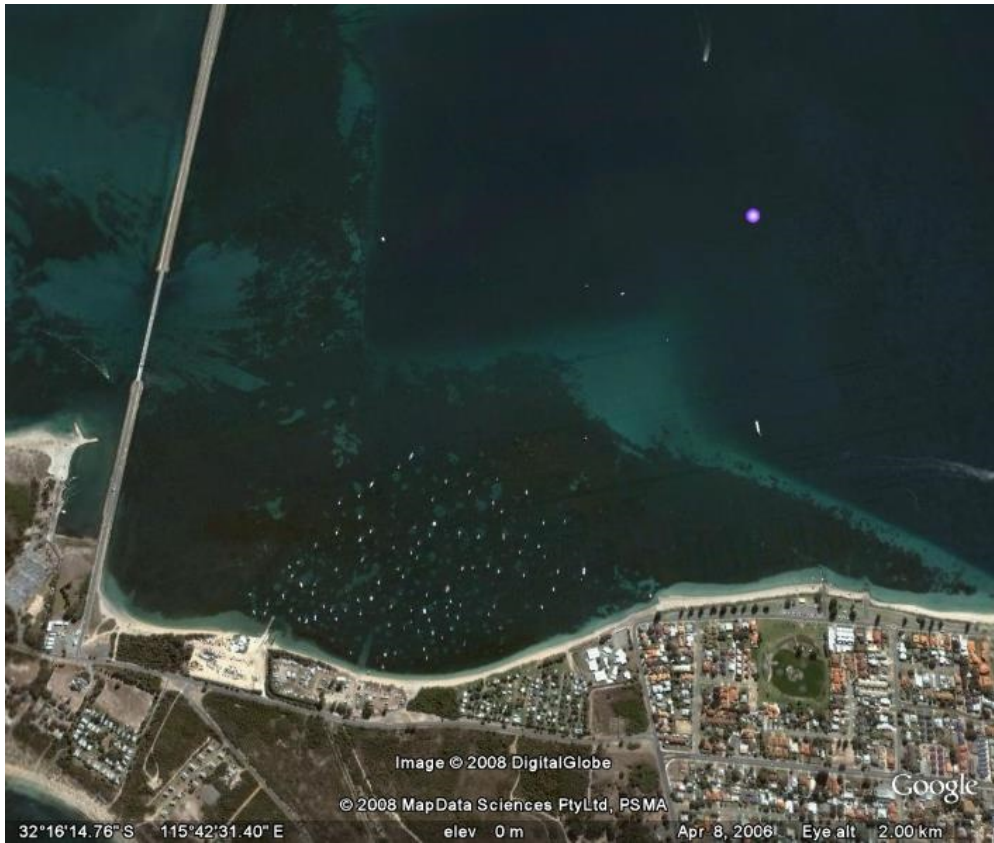
Plate 13: Stormwater drainage outlet at Rockingham Beach discharging directly into Cockburn Sound (Source: Garry Middle).



Plate 14: Boats moored in Mangles Bay, south-eastern end of Cockburn Sound. The darker water areas are seagrass meadows (Source: Garry Middle).



Plate 15: Aerial photograph of Mangles Bay clearly showing boat moorings and associated loss of seagrass (Source: Google Earth)



Next, in response to the exceedance of the TBT EQC in and surrounding Jervoise Bay, the CSMC requested that the DEC investigate the likely sources of TBT and take any action appropriate. The DEC responded by carrying out an unannounced audit of the boat maintenance industries at Jervoise Bay (TBT is a boat antifouling agent). The use of TBT is not completely banned in WA, but its use on vessels less than 25m is banned and a licence is required to use it on larger boats. Whilst it was found that all industries were using TBT free agents, there were several inappropriate management practices being carried out, including poor management of wash-down water that could potentially contain TBT. The DEC organised a workshop for these industries to identify better management practices, and indicated that in the future action against poor management practices would be taken. Finally, the DEC and industry continue to work together to ensure licensed discharges into the Sound do not cause breaches to the EQCs. These examples show that downstream decision making is consistent with the EMP/SEP. Further, all of the CSMC members interviewed indicated that they would cooperate to implement the EMP and ensure their own agency's decision making would be consistent with the EMP. This suggests that the policy making of these policies can be evaluated as being successful on the performance effectiveness criterion.

Political support

As noted earlier in this chapter, both policies were finalised at the same time, January 2005, over four years after the first draft was released in December 2001. Table 19 provides the information on the time it took to finalise the other EPPs covered in Chapter 5 and compares this to the time taken to finalise these Cockburn Sound policies.

The policies with successful policy making were completed relatively quickly, less than two years, with the Swan–Canning EPP taking three years, one year less than the Cockburn Sound policies. The evaluation of the policy making of the Swan–Canning EPP concluded that the length of time taken to finalise the EPP combined with the views of interviewees meant that the policy making of this EPP was unsuccessful on this criterion. However, in relation to the Cockburn Sound policies, it was noted that it was the EPP that caused the delay in the finalisation of both policies, with the EMP ready to be finalised around two years ahead of the EPP. A further complicating issue is that once the decision was made to change the EPP to a non statutory SEP, opposition to the SEP largely disappeared and the SEP was finalised relatively quickly, some four months after the draft was published.

Table 19: Time taken to finalise the policies covered in Chapter 5 and the Cockburn Sound policies

Policy	Evaluation on political support criterion	Time taken to finalise policy
Draft Western Swamp Tortoise EPP	Unsuccessful.	10 years
Kalgoorlie air quality EPPs – 1989, 1992	Successful.	1–2 years
Ozone EPPs (1989 & 1992)	Successful.	1–2 years
1992 Kwinana air quality EPP	Successful.	1–2 years
1999 Kwinana air quality EPP	Unsuccessful.	Review incomplete – 1992 EPP rolled over.
1992 Lakes EPP	Successful.	1–2 years
1999 draft Wetlands EPP	Unsuccessful.	Review incomplete – 1992 EPP rolled over.
Swan Canning EPP	Unsuccessful.	Three years
Cockburn Sound SEP/EPP and EMP	(see later in chapter)	Four years

These differential views are reflected in the views of stakeholders, where there was unanimous view that the EMP would be successful, but the EPP received a largely sceptical evaluation. Here are some of the views typical of the stakeholders:

The EMP was actually put together by the practitioners, if you like: the people who have to make it work. ... We all thought generally that that's probably a pretty good

way to go. ... I think the EMP could easily be successful. The EPP, we'll wait and see.

I think the EMP is likely to be successful. Essentially, the EMP is a management plan and it wouldn't matter whether it was attached to an EPP or not ... It's a doing document that sets out everybody's role in meeting the objectives of the EPP ... The EPP, my perception of it, and it is a perception, is that's it's probably been delivered a bit too much from the top down, and there probably hasn't been as much consultation as there might have been.

I think the EMP has a better chance of working because there was more involvement by all stakeholders right up front. There wasn't an EMP produced in 1996. I wouldn't say it was a blank sheet of paper but it was a more inclusive process and all the stakeholders were given a chance to help direct the outcome ... Whereas I think the EMP wasn't a blank piece of paper but it certainly had a lot less paragraphs on it in terms of how much was already locked before you got into the process. I think that with the EPP more was locked in than with the EMP.

The EPP, I'm not convinced it will work. I think it's too complicated in terms of the targets and standards, if you like, the EQCs. I think they are way too comprehensive for any ordinary group of people to even get their heads around much less measure and monitor them.

Finally, as already noted above, there was considerable opposition to the draft EPP, largely because of the EQCs and the legally binding nature of an EPP.

It follows from this discussion that the EMP has considerably more political support than the draft EPP and that in isolation the policy making of the EMP could be considered successful on this criterion and the policy making of the draft EPP unsuccessful. The change to the SEP may not necessarily increase its political support because, whilst industry opposition to the policy largely disappeared with the change, the conservation and community groups expressed considerable concerns about the SEP's non-statutory nature. In considering whether the policy making of these two policies as a package has been successful on this criterion, and given the mixed success of each individually, it is important to identify which policy is the most significant to the stakeholders and as an implementation tool. As already noted in the previous section on the policy making approach, it is compliance with the EQCs (the health of the Sound) and the implementation of the EMP that is of most concern to the broader community and the key stakeholders. The EMP has as its focus ensuring the EQCs are met and it covers the broader socio-economic issues of concern to stakeholders not able to be covered by the EPP. On balance then, the EMP is of greater significance to stakeholders than the SEP, and, therefore, because the EMP can be considered to have

political support, the policy making of the policy package can be considered to be successful on the political support criterion.

Content relevance

The key area where the content of the two policies was contested was the EQCs, and whilst industry still oppose some of the aspects of the EQCs in the final SEP, there has been broad support for the implementation of the EMP and the reporting against the EQCs. Whilst there were some general concerns raised by stakeholders regarding the EPP, they were not widespread: for example:

Yeah well I guess my view is that the EPP is a bit old style regulation, I think we could have been more progressive and more forward looking, you know at the very least maybe not making it a criminal penalty but just setting up some system of social contracts for the sort of things we are talking about ... and I think the scope and if you like governance models driving out of the EPP, are the thing that I would have liked to have seen changed: a bit of innovation there.

The EPP, I'm not convinced it will work. I think it's too complicated in terms of the targets and standards, if you like, the EQCs. I think they are way too comprehensive for any ordinary group of people to even get their heads around much less measure and monitor them.

The content of the EMP, because of the more participative way it was developed, has the broad support of the Cockburn Sound community and received only passing criticism from a few stakeholders. Overall, then, it can be concluded that the policy making of the policy package is successful on the criterion of "content relevance".

Other socio-economic impacts

The implementation of the SEP and EMP has, and will continue to, impose additional burdens on some of the key players, notably: industry will be expected to continue to contribute to the monitoring of Cockburn Sound; where breaches of EQC standards are detected, the responsible industry will have to improve management to ensure compliance; and, resources will need to be allocated to deal with diffuse sources of contamination (for example, stormwater) where problems are identified. As well, the implementation of the no net loss principle will impose additional cost for proponents of new developments in the Sound.

These policies will impose additional socio-economic costs to some key players, but this needs to be weighed against the net benefits to the community of having a better managed and healthier Cockburn Sound. Based on the responses from the community and NGO

representatives on the CSMC, and responses at community forums, these additional costs are part of doing business in the Sound, and Industry and Local Government have also accepted this. This is similar to observations made in relation to the Kalgoorlie and Kwinana air quality EPPs in Chapter 5, where the increased cost to industry of complying with the EPP was not seen as being excessive or of significant concern. As well, the benefits of improved air quality for the broader community were seen as out–weighing these additional costs to industry.

Overall, then, it can be concluded that this policy making of the policy package is successful on the criterion other socio–economic impacts.

Discussion

Summing up the above analysis, the policy making of the policy package of the SEP/EMP can be considered successful on all four criteria — although of the two policies, the EMP has more political support than the SEP. The success of this policy package is consistent with the hypothesis in this thesis that the adaptive–collaborative approach to environmental policy making is the approach that is most likely to be successful in contexts where conflict is deeply embedded as part of policy making. As was argued above, there are all three types of conflict present associated with policy making in Cockburn Sound, and the Cockburn Sound resource is becoming scarcer. The policy making approach was shown to be adaptive–collaborative (passive adaptive), based predominately on the EMP’s approach. The policy evaluation found that the package was successful on all four criteria.

Consideration of the draft EPP in isolation provides further support for the hypothesis. The policy making approach of the draft EPP was shown to be a traditional expert–driven policy approach, it met significant opposition from some key stakeholders, and the evaluation above shows that it would have not been successful on at least one criterion — political support. Had the EPA pursued the statutory EPP approach, all subsequent decision making, including the EMP itself, would likely not have followed (Performance effectiveness criterion). The change to a SEP is recognition of this.

It was argued in Chapter 5 that, preceding the Cockburn Sound policy making exercise, the EPA was beginning to do policy making more collaboratively, but it had yet to embrace a fully collaborative approach. The predominance of the science–focused view of the key players within the EPA, and the success the EPA has had using the traditional expert–driven and ecological modern policy making approaches encouraged to the EPA to be risk averse and stick largely to traditional expert–driven and ecological modern policy making approaches. It was concluded from this that the EPA still had some institutional learning to do in respect of policy making in these highly contested contexts. The Cockburn Sound example shows that the EPA has progressed in this regard: it adopted a higher level of participation for this policy than for any other previous policy making exercise, at IAP2’s

(2007) involve; and, the decision to change from a statutory EPP to a non-statutory SEP enabled most of the conflict over the EQCs to be diffused, although the conservation and community groups had some concerns over this move. This is an encouraging development.

Summary

This chapter discussed at length a specific case study of environmental policy making in a highly contested policy making context — Cockburn Sound. This was done to further test the hypothesis of this thesis that the adaptive-collaborative approach to environmental policy making is the approach that is most likely to be successful in these contexts. A policy package was developed for Cockburn Sound which involved an overall SEP (it was originally proposed to be an EPP), which set the environmental values and objectives for the on-going management of the Sound and set specific EQCs, and an EMP which set out how the EQCs were to be achieved. The CSMC was also established to provide a collaborative forum policy development and the ongoing management of Cockburn Sound.

It was shown that there is significant conflict associated with policy making for Cockburn Sound with the three resource scarcity issues identified in Chapter 2 being present (loss of some areas of Cockburn Sound for public use, increasing demand on resources with a growing number of users and competition for space and loss of good quality resource through the deterioration of water quality). Four significant examples of social conflict were provided (reducing beach access, significant community mistrust of industry, a fundamental difference over what the long term management vision for the Sound should be and the no net loss principle) to demonstrate that the level of social conflict at Cockburn Sound was, and still is, significant. It was argued that there has been a history of contested and poor environmental governance of the Sound leading to the environmental problems, notably the loss of sea grass, and whilst the new governance arrangements are seen as an improvement, some concerns remain, notably the non-statutory nature of the SEP. It was shown that the science surrounding the draft EPP was fiercely contested, especially the EQCs, and the debate about some of them continues.

It was shown that the overall policy package adopted an adaptive-collaborative approach and, consistent with the thesis hypothesis, the policy making was evaluated as being successful on the four criteria established in Chapter 4. As further support to this hypothesis, it was noted that the draft EPP (the precursor to the SEP) was a traditional expert-driven policy approach (although with a much improved level of participation) and that, if evaluated as a separate policy making exercise from the EMP, the policy making would have been unsuccessful on two of the criteria — performance effectiveness and political support.

Finally, it was argued that the EPA, the peak environmental agency in WA, has continued its institutional learning in its policy making in highly contested contexts by moving towards fully embracing a collaborative approach to its policy making.

Chapter 7 – Implications of the study

Overview

This study started with perhaps a none too surprising proposition that some policy making approaches are better suited to highly contested contexts than others, and went on to propose that an adaptive–collaborative approach would most likely succeed where conflict is both intense and broad. Whilst the environmental policy making of the Western Australia’s peak environmental agency (the EPA) was the focus of this work, it was always intended that this study would have something to say about environmental policy making more generally. This is possible because environmental governance and the key issues in WA are typical of most of the developed world.

Improving the understanding of environmental policy making in highly contested contexts

This thesis proposed a theoretical perspective for studying environmental policy making and conflict consisting of two elements. The first was an examination of the nature and extent of conflict in policy making and, based in part on work by Jackson and Pradubraj (2004) and McKinney and Harmon (2007), three broad themes with one key trigger were identified. The three themes were social; governance; and science and information. Resource scarcity was defined as having three possible components: decreasing quantity of that resource (e.g. loss of bushland); increasing demand on the resource (e.g. more users); and reduced quality of an existing resource (e.g. loss of water quality).

The second component was to propose that environmental policy making can be categorised into one of four broad approaches: traditional expert–driven, ecological modern, collaborative and adaptive–collaborative. It was argued, and then demonstrated through an analysis of the policy making of the EPA, that these four broad policy making approaches had different degrees of success depending on the level of conflict present, with the collaborative and adaptive–collaborative approaches shown to be the most successful in these contexts. In contrast, where either traditional expert–driven or ecological modern approaches were attempted in cases of significant conflict, policy failure occurred — although in one case where a traditional expert–driven approach was applied and the level of conflict was relatively significant, policy success occurred; this exception will be returned to later.

This analysis drew on the international literature and should prove to be a useful model for studying environmental policy making in highly contested contexts in developed countries other than Australia.

Understanding of an agency's learning through its on-going policy making

A key part of this thesis was to study the policy making of a single environmental agency (the WA EPA) as part of testing the thesis hypothesis. The results of that analysis could be typical of environmental agencies throughout the developed world.

There is a chronological order associated with the EPA's policy success and failure, with the early policy making largely successful and the more recent ones largely unsuccessful. The early EPPs were either traditional expert-driven or ecological modern, and whilst they were shown to be successful, the level of conflict was relatively low in these cases. This success reinforced the view of many of the policy makers within the EPA that a process described as science-focused would continue to be successful which led to continued use of traditional expert-driven and ecological modern approaches, even though the more recent contexts involved significant levels of conflict. Whilst it was clear that significant technical learning had occurred to match the complexity of the environmental issues at stake, agency institutional (social) learning did not keep up. It was clear that the EPA did not pay enough attention to the growing conflict associated with these newer policies, and the continued preference for traditional expert-driven and ecological modern approaches to policy making led to policy failure.

There was an emerging counter view to the science-focused view that science was not as significant to policy making and more participative processes were required. This view was held by stakeholders who were mostly outside the EPA, and encouraged the EPA to adjust its policy making. By the late 1990s and early 2000s the EPA was developing a new policy making model for these more contested contexts involving two complementary policies: an overarching EPP; and a subsidiary implementation policy. This was called a concurrent-complementary model. In the two examples where this model was applied, the subsidiary policies were developed using a collaborative approach but the EPA adhered to an expert-driven approach, although it was noted that in the case of Cockburn Sound the EPA was more participative in the policy development phase. Clearly, institutional learning occurred.

This new model of policy making does not seem to have been reported elsewhere in the literature and could prove to be a useful model for other agencies. The process whereby the EPA arrived at this new model should also be of broader interest. The tension between the two views about how policy should be developed (science-focused and participative-focused) led to important institutional learning and improved policy making by the EPA.

Understanding a key barrier to successful policy making

One of the key barriers to social learning by the EPA was that it did not have an adequate policy evaluation methodology, which meant that it was largely unaware of the success or otherwise of its policy making. Where the EPA carried out policy evaluation it was on performance effectiveness, which, as argued in this thesis, is not only extremely problematic for complex policies with long time frames for implementation where actual environmental improvement or degradation may take many years to become apparent, but is too narrow a focus and avoids consideration of broader issues — for example, unintended socio-economic effects. As well, the EPA policy evaluation was carried out internally and may be viewed as not being completely objective.

Robust and objective policy evaluation is an important feedback tool for policy making agencies and this study proposed a flexible, relatively simple and robust policy evaluation methodology that was used to evaluate the policies of the EPA.

Understanding adaptive management

The adaptive–collaborative policy making approach is a particular focus of this study, and it was noted that the notion of adaptive management, the critical policy tool for this approach, had a range of meanings in the literature. This study developed a model of adaptive management, based in part on work by Pagan and Crase (2005), which involved: a matrix involving level of conflict; implications of failed management; level of understanding of the system in question; and the need for mathematical modelling and monitoring (see Figure 1). The model is well suited to most environmental policy making contexts and should be a useful tool for decision makers when planning a policy making exercise.

Against the trend — successful policy making in contested contexts using the traditional expert–driven approach

It was noted earlier in this chapter that there was one example of EPA policy making where a traditional expert–driven approach was used successfully in a context with relatively high levels of conflict: this was the Lakes EPP. It was noted that there was a high profile and active policy champion, and that this person was able to overcome the lack of an adequate participative process and push the policy through to approval. Whilst this is a useful lesson

in policy making, it needs to be interpreted with some caution. When the policy was to be reviewed in the early 2000s, the revised policy received considerably more opposition than the original EPP (developed in the early 1990s). This was largely because the revised policy was planned to be more comprehensive and cover many more wetlands. It is unlikely, therefore, that a policy champion could have possibly overcome this level of opposition and conflict without a more collaborative approach with the key stakeholders and starting with a policy blank sheet. It was argued in this thesis that the fact that the EPA adopted a less participative traditional expert-driven approach was the reason for policy failure. The best we can conclude from this is that a policy champion can facilitate an easier policy making process, but cannot be expected to crash through entrenched conflict without adopting a collaborative approach. A policy champion may crash through low-to-moderate levels of conflict only.

Understanding policy making scenarios involving highly contested contexts

Introduction

A key message that can be taken from this research is that the policy making approach should match the nature and extent of conflict associated with the exercise. Based on the results and analysis of this thesis it is possible to identify five policy making scenarios and matching policy making approaches, as described below.

Minimal conflict

This is where there are minimal levels of social, governance of science and information conflict. It may be that there are few competing stakeholders, there is relative agreement amongst the stakeholders, and/or the resource in question is not scarce. Governance arrangements are relatively simple, usually involving one or only a few agencies within a single level of government. Where several agencies are involved across more than one level of government, the existing governance arrangements are well integrated. The resource or ecosystem subject to policy making is well understood with little debate about the nature of the problem and how to address it.

In these cases, both traditional expert-driven and ecological modern approaches would likely be successful. A collaborative approach would be excessive, given the resources involved. Passive adaptive management may be appropriate in support of the command and control or market mechanisms applied if the system is highly sensitive to change.

Social conflict dominates

This is where there are significant levels of social conflict but conflict in relation to governance of science and information is minimal. Here, there would be many competing stakeholders and strong disagreement about how the resource should be used and managed. As well, the resource in question is considered scarce. Governance arrangements are relatively simple as described above, and whilst the resource or ecosystem subject to policy making and the problem would be well understood, there is considerable debate about how to address the problem based on the different values the stakeholders hold for the resource/ecosystem.

In these cases, a collaborative approach would be required, with a particular emphasis on involving the key stakeholders in the decision making process. The aim of the participative process is to address the conflict between stakeholders and to seek solutions and policy measures that address the problem but have a level of support from stakeholders. The role of the governance agencies would be to provide advice on the types of policy mechanism available to address the problem. A range of policy measures could be applied, including command and control or market mechanism, and passive adaptive management may be appropriate if the system is highly sensitive to change.

Governance conflict dominates

Here the levels of social and science and information conflict are relatively low, but conflict over the governance of the resource or ecosystem is significant. There would be few competing stakeholders and relative agreement about the nature of the problem, largely because the resource or ecosystem subject to policy making is well understood and not considered scarce (although the poor governance arrangements could be a threat to the resource).

Governance arrangements, however, are relatively complex involving several agencies and/or more than one level of government. Typically, the existing governance arrangements are not well integrated, and consequently there is poor management of the resource or ecosystem.

In these cases, a collaborative approach would be required, with a particular emphasis on involving the key agencies rather than community stakeholders. The aim of the participative process is to work through the competing and overlapping jurisdictions, and to seek policy measures that address the problem and facilitate integrated decision making. Again, a range of measures could be applied including command and control or market mechanism. Passive adaptive management may be appropriate if the system is highly sensitive to change.

Social and governance conflict dominates

These situations involve a combination of the last two scenarios. The critical point is that whilst the resource or ecosystem in question is usually well understood, there is considerable debate about how to address the problem, based on the different values the stakeholders hold for the resource/ecosystem and there is confusion about the governance arrangements for any of the chosen policy mechanisms.

In these cases, a collaborative approach would be required to address both the conflicts over the competing values held by stakeholders and the competing and overlapping governance jurisdictions. The aim of the participative process is not only to address these conflicts but is also to seek solutions and policy measures that address the problem, to obtain a level of support from stakeholders and to facilitate integrated decision making. The collaborative approach would involve both the key stakeholders and the agencies responsible for governance working together to seek agreed policy outcomes. Again, a range of measure could be applied including command and control or market mechanism, and passive adaptive management may be appropriate if the system is highly sensitive to change.

Social, governance and science and information conflict

This scenario differs from the last in that the resource or ecosystem subject to policy making and the nature of the problem are both poorly understood. There is not only considerable debate about how to address the problem based on the different values the stakeholders hold for the resource/ecosystem and confusion about the governance arrangements for any the chosen policy mechanisms, but there is considerable debate, uncertainty and disagreement about how the system would respond to any policy or management measure. These are the truly wicked problems.

In these cases, not only is the collaborative approach described in the last scenario required, the technical experts and those with local knowledge must be part of the participative process. Active adaptive management would likely be required to address the uncertainty, which makes the overall policy making approach adaptive–collaborative.

Final word

This thesis started with Neil Young and an observation about the way we plan and manage the environment. It's fitting to finish with another quotation from the legend himself:

'In the field of opportunity

It's plowin' time again.

There ain't no way of telling

Where these seeds will rise or when

I'll just wait around 'til springtime

And then, I'll find a friend

In the field of opportunity

It's plowin' time again.'

Field Of Opportunity – Neil Young.

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Appendix 1 — Details of the policy evaluations reviewed in Chapter 4.

1. Introduction

This Appendix provides the details of the analysis carried out on the policy evaluation literature which is the basis of the discussion in the first part of Chapter 4.

Section 2 describes the assessment methods used by agencies, both government and non government to evaluated policies or projects with environmental impacts. Section 3 describes methods used by independent researchers in the policy assessment. Two tables are used to present the information in Sections 2 and 3. The first table summarises the references and the area of policy evaluation each is applied to. The second table describes the evaluation criteria applied using the following headings:

- Evaluation criterion name used in the work;
- A description of each criterion;
- A suggested generic descriptor of the criterion (i.e. type) to be used later in summarising the various evaluation approaches; and
- Criterion category (i.e. the stage of the policy making process being evaluated).

The generic evaluation criteria were derived after analysis of all of these studies. It is proposed here that the evaluation criteria can be typed as either:

- Performance effectiveness – how well the implementation of the policy delivers on environmental objectives;
- Political support – whether the policy gains support from the community, key stakeholders and the political process;
- Performance efficiency – related to the cost effectiveness of the policy;
- Content relevance – whether the policy actually addresses the environmental issues at stake;
- Other socio-economic impacts – whether the policy has impacts (positive and negative) other than environmental (i.e. social and/or economic);
- Social equity – related to how the costs and benefits of the policy are distributed throughout the community;

- Legal effectiveness/enforceability – related to the legality and practicality of the actions proposed in the policy;
- Measurability – whether the policy contains mechanism that allow for impacts to be measured;
- Innovation – whether the policy encourages new and innovative solutions to the environmental problems;
- Flexibility – whether the policy mechanisms can adapt to changing circumstances.; and
- Other – miscellaneous criteria used not applied in more than one study.

2. Agency evaluation

A total of six policy evaluation methods are covered from agencies that are both government bodies and non government organisations. Table 1 summarises the agency assessment methods and Table 2 is a summary of the criteria applied.

Table 1: Summary of international policy evaluation methods

Agency name	Agency type	Reference	Name used in Table 2	Year	Application
International Union for Conservation of Nature and Natural Resources, World Resources Institute, Conservation International, World Wildlife Fund (USA) and World Bank	NGO	Conserving the World's Biological Diversity"(McNeely et al. 1990)	IUCN 1990	1990	Evaluate biodiversity strategies and actions plans.
USA Environmental Protection Agency	Govt	Policy Planning to Reduce Greenhouse Gas Emissions (USEPA 1998)	USEPA Greenhouse 1998	1998	Evaluate policy measures to reduce Greenhouse Gas emissions.
European Union (EU)	Govt	Defining Criteria for Evaluating the Effectiveness of EU Environmental Measures (Anon 1999)	EU 1999(1)	1999	Evaluate the measures undertaken by member States to implement the EU's environmental legislation
EU	Govt	An Evaluation of Phare-financed Energy and	EU 1999(2)	1999	Evaluation of environmental programmes

		Environmental Programmes (Evaluation Unit of the Joint External Relations Service of the European Commission 1999).			supported by the EU in its Easter Block members.
Agency name	Agency type	Reference	Name used in Table 2	Year	Application
IUCN	NGO	Draft IUCN Evaluation Policy (Monitoring and Evaluation Division of the IUCN 2001)	IUCN 2001	2001	Evaluation of policies, plans and programmes aimed at conserving biological diversity.
The World Bank	Govt	Guidelines and Criteria for OED Project Evaluations (Operations Evaluation Department of the World Bank 2002, 2001).	WB 2001/2	2001 & 2002	Evaluation of its lending programmes and its environmental policies and programmes.

Table 2: Evaluation criteria used in the international studies summarised in Table 1.

Assessment Name (Table 1)	Criteria name	Description	Suggested generic descriptor(s)	Criteria type
ICUN 1990	Not specified	The degree to which the policies are prepared by those responsible for implementation	Content relevance	Policy making process
	Not specified	Degree of political support	Political support	Policy performance – direct
	Not specified	Degree of financial support	Political support	Policy performance – direct
	Not specified	Extent to which policy addresses real needs of the affected area or the mandate of the involved institutions	Content relevance	Policy content

	Not specified	Effectiveness of implementation mechanisms in policy to ensure actions are followed up	Measurability	Policy performance – direct
	Not specified	Degree to which policy contains actions which address the problems the subject of the policy	Content relevance	Policy content
Assessment Name (Table 1)	Criteria name	Description	Suggested generic descriptor(s)	Criteria type
USEPA Greenhouse 1998	Effectiveness in reducing Greenhouse Gas Emissions	Measurable changes in Greenhouse Gas Emissions	Performance Effectiveness	Policy performance – direct
	Private sector costs and savings	Cost to, and saving for, the private sector because of implementation of the policy	Other socio-economic impacts	Policy performance – ancillary
	Public Sector Costs	Costs (and benefits) of implementing the policy for the relevant Government agencies	Performance Efficiency	Policy performance – direct
USEPA Greenhouse 1998 (cont)	Institutional capacity	Are the targeted institutions capable of carrying out policy measures	Institutional capacity	Policy content
	Enforceability	Relevance and practicality of any enforceability measures	Legal effectiveness/ Enforceability	Policy content
	Economic efficiency	Cost effectiveness of policy measures	Performance efficiency	Policy performance – direct
	Social equity	Are costs and benefits shared equally	Social equity	Policy performance – direct and ancillary
	Political support	Degree to which policy measures are supported politically and by the community	Political support	Policy content
	Legal constraints to its operation	Are they legal impediments to any of the policy measures	Legal effectiveness/ Enforceability	Policy – content
	Ancillary benefits and costs	Unforeseen benefits and costs	Other socio-economic impacts	Policy performance – ancillary
USEPA	Measurability	Does the policy contain	Measurability	Policy

Greenhouse 1998 – cont		measures to enable policy performance to be evaluated		content
	Flexibility	Is the policy able to easily adapt over time as circumstances change?	Flexibility	Policy content
Assessment Name (Table 1)	Criteria name	Description	Suggested generic descriptor(s)	Criteria type
EU 1999	Effectiveness	Achievement of policy objectives in both environmental impacts and changing behaviour of the target agencies	Performance Effectiveness	Policy performance – direct
	Relevance	Extent to which objectives address the issue or problem	Content relevance	Policy content
	Efficiency	Achieving objectives at lowest cost	Performance efficiency	Policy performance – direct
	Utility	Changes to net social welfare, both intended and unintended	Other socio–economic impacts	Policy performance – direct and ancillary
EU 1999 (2)	Efficiency	Relates to the level of inputs to achieve outputs. Includes cost benefits analysis and other qualitative measures	Performance efficiency	Policy performance – direct
	Effectiveness	In achieving specific environmental objectives, in changing subsequent measures, and in changing target organisation's	Performance effectiveness	Policy performance – direct
	Impact	Of programme in other non–targeted areas	Other socio–economic impacts	Policy performance – ancillary
	Sustainability	The degree to which the general working environment is supportive of the programme's continuity	Political support	Policy performance – direct
EU 1999 (2) – Cont	Relevance	The extent to which the policy should meet its objectives	Content relevance	Policy content
IUCN 2001	Relevance	Relevance of the policy to the organisation's goals	Content relevance	Policy content

	Effectiveness	Extent that the policy is meeting objectives and is performing well	Performance Effectiveness	Policy performance – direct
	Efficiency	Using resources cost-effectively	Performance Efficiency	Policy performance – direct
Assessment Name (Table 1)	Criteria name	Description	Suggested generic descriptor(s)	Criteria type
	Impact	The additional changes that occur because of the implementation of the policy, on target agencies and non-target agencies, additional effects – environment & socioeconomic	Other socio-economic impacts	Policy performance – ancillary
	Sustainability	The degree to which the general working environment is supportive of the policy's continuity	Political support	Policy performance – direct
WB 2001/2	Relevance of objectives	The extent to which the objectives are consistent with the needs of the programme and the institutions applying the programme	Content relevance	Policy content
	Efficacy	The extent to which objectives are achieved	Performance Effectiveness	Policy performance – direct
	Efficiency	The extent to which the programme delivers on its objectives with cost and benefits compared to alternatives	Performance efficiency	Policy performance – direct
	Sustainability	The likelihood that the programme will deliver benefits given the general working environment (political and social) the programme has to operate within	Political support	Policy content
	Institutional Development Impact	The extent to which the programme leads to a more efficient, equitable and sustainable use of institutional human, financial, and natural resources – intended and unintended	Performance Efficiency Other socio-economic impacts	Policy performance – direct and ancillary

	Outcome	The extent to which the major objectives were achieved efficiently. This is an overall evaluation taking into account relevance, efficacy and efficiency.	Performance efficiency	Policy performance – direct and ancillary
Assessment Name (Table 1)	Criteria name	Description	Suggested generic descriptor(s)	Criteria type
WB 2001/2 – cont	Bank and Borrower Performance	Relates to procedural and process performance of both the Bank and the borrower	N/A	N/A

3. Policy assessment by Researchers

Table 3 summarises the assessment methods used by researchers reviewed and Table 4 is a summary of criteria used.

Table 3: Summary of environmental policy evaluation methods in the academic literature

Reference	Application
Economou (1992)	Evaluation of environmental policy making at the national level in Australia.
Janicke and Weidner (1995)	Evaluation of 24 case studied in environmental policy world-wide
Barron and Ng (1996)	Evaluation of various solid waste management policy instruments
Barde and Smith (1997)	Evaluating the economic instrument used by the OECD countries to deal with environmental protection.
Hughey (2000)	Evaluation of the operation of a Dolphin wildlife sanctuary in New Zealand
Fullerton (2001)	Evaluation of environmental policy in general
Cabugueira (2001)	Evaluating voluntary agreements in environmental policies.
Enzensberger, Wietschel et al (2002)	Evaluating policy instruments to apply in selecting to encourage the use of wind energy.
Alberini and Segerson (2002)	Evaluating voluntary environmental programmes

Table 4: Evaluation criteria used in the international studies summarised in Table 3.

Reference (Table 3)	Criteria name	Description	Suggested generic descriptor(s)	Criteria type
Economou (1992)	Stakeholder agreement	Were all the stakeholders in the policy making process are satisfied with the outcome	Political support	Policy making process
	Real environmental improvement	Where real environmental improvement can be shown quantitatively	Performance Effectiveness	Policy performance – direct
Janicke and Weidner (1995)	Lasting effect	Are the environmental gains short, medium or long term	Performance effectiveness	Policy performance – direct
	Bonus effects	Are the environmental gains a direct result of the policy or as result of other initiatives	Performance effectiveness	Policy performance – direct
	Problem shifting	Are the environmental gains achieved by shifting problems to other sectors	Other socio–economic impacts	Policy performance – ancillary
	Innovation	Are the policy measures about resource saving or end of pipe solutions	Innovation	Policy content
	Efficiency	Are the environment gains accompanied with economic benefits as well	Performance efficiency	Policy performance – direct
Barron and Ng (1996)	Perception of effectiveness	In dealing with the problem or meeting objectives	Content relevance	Policy content
	Compliance monitoring/enforcement	Are there Policy measures which measures/monitor outcomes reliably and cost effectively	Measurability	Policy content
	Ease of implementation	Using existing technologies and management systems	Content relevance	Policy content
	Least financial cost	Lowest cost option chosen	Performance efficiency	Policy performance – direct

	Robustness/Flexibility	Policy contains measures which retain effectiveness under a range of economic and technical conditions	Flexibility	Policy content
Reference (Table 3)	Criteria name	Description	Suggested generic descriptor(s)	Criteria type
Barron and Ng (1996) – cont	Broader Macroeconomic Impacts	Adopting policy measures that are compatible with fostering growth and containing inflation	Other socio-economic impacts	Policy performance – ancillary
	Equity	Does the policy address the distributing cost and benefits fairly	Social equity	Policy content
	Ecological impacts	Policy implementation would lead to the least impact on affected ecosystems through the implementation of waste management measures	Performance effectiveness	Policy performance – direct
	Economic efficiency	Using full cost benefit analysis	Performance efficiency	Policy performance – direct
Barde and Smith (1997)	Environmental effectiveness	Delivery of a positive environmental outcome	Performance Effectiveness	Policy performance – direct
	Economic efficiency	Cost effectiveness of policy compared to alternatives	Performance efficiency	Policy performance – direct
	Administration and compliance costs	For both government and industry	Performance efficiency	Policy performance – direct
	Taxation benefits	If policy measures require new taxation measures then other taxes could be reduced	Other socio-economic impacts	Policy content
	Wider economic effects	Including employment, trade and distributional effects	Other socio-economic impacts	Policy performance – ancillary
	Dynamic effects and innovation	Ability of policy measures to deliver innovative solutions	Innovation	Policy content
	Soft effects	A broad category of difficult to measure effects like attitude changes, capacity building etc	Other socio-economic impacts	Policy performance – ancillary
Hughey	Equity and	Does the policy address	Social equity	Policy

(2000)	fairness	distributing cost and benefits fairly		performance – ancillary
	Impact minimisation	Reducing impacts on those negatively affected by policy measures	Other socio-economic impacts	Policy performance – ancillary
Reference (Table 3)	Criteria name	Description	Suggested generic descriptor(s)	Criteria type
Hughey (2000) – cont	Achieving short-term environmental gains	Does the policy deliver environmental benefits in the short term?	Performance Effectiveness	Policy performance – direct
	Achieving longer-term environmental gains	Does the policy deliver environmental benefits in the longer term?	Performance Effectiveness	Policy performance – direct
	Positive benefits to other environmental programmes	Will the policy measures lead to other environmental benefits, including capacity building	Performance Effectiveness	Policy performance – ancillary
	Cost implications for other programmes	Do the policy measures pull resources away from other areas of the environment?	Performance Effectiveness	Policy performance – ancillary
Fullerton (2001)	Economic efficiency	Related to cost benefit analysis	Performance efficiency	Policy performance – direct
	Administrative efficiency	Government costs to administer the policy and industry compliance costs	Other socio-economic impacts	Policy performance – ancillary
	Monitoring and enforcement	Policy needs to ensure that evasion of any policy measures are avoided through appropriate monitoring, readily measurable outputs as well as adopting measures that deal with avoidance and evasion.	Measurability Legal effectiveness/ Enforceability	Policy content
	Political and ethical considerations	The policy must be politically feasible and fit within the beliefs and ethics if the community to which it is to apply	Political support	Policy performance – direct
	Equity and distributional effects	Costs and benefits to be shared in an equitable manner	Social equity	Policy performance – ancillary
	Other distortions	To the operations of the market economy need to be identified and considered	Other socio-economic impacts	Policy performance – ancillary

	Flexibility and dynamic adjustments	Policy measures should be flexible enough to respond to changing circumstances without the need for actual policy changes	Flexibility	Policy content
Reference (Table 3)	Criteria name	Description	Suggested generic descriptor(s)	Criteria type
Cabugueira (2001)	Static efficiency	Capacity of policy to minimise short term costs	Performance efficiency	Policy performance – direct
	Dynamic efficiency	Capacity to promote appropriate technological changes as well as flexibility, creating a co-operative approach and increasing environmental awareness	Other	Policy content
	Effectiveness	Ability to meet environmental objectives	Performance Effectiveness	Policy performance – direct
	Equity	In terms of distributing costs and benefits	Social equity	Policy performance – ancillary
Enzensberger, Wietschel et al (2002)	Effectiveness	Degree to which policy objectives are met	Performance Effectiveness	Policy performance – direct
	Static Efficiency	Highest outcome per capital involved in the implementation. Transaction cost need to be considered as well.	Performance efficiency	Policy performance – direct
	Dynamic Efficiency	Policy measures which promote innovative efficient outcomes rather than favouring existing efficient solutions	Innovation	Policy content
	System conformity	Policy instruments should comply with the existing market and legal systems.	Legal effectiveness/ Enforceability	Policy content
	Practicability	Dealing with regulation and control requirements	Legal effectiveness/ Enforceability	Policy content
	Flexibility	This is applicable when the existing technical and/or regulatory and/or political environment is not known or uncertain	Flexibility	Policy content

	Impact on economic development	Additional economic benefits or impacts of the affected region	Other socio-economic impacts	Policy performance – ancillary
Reference (Table 3)	Criteria name	Description	Suggested generic descriptor(s)	Criteria type
Alberini and Segerson (2002)	Effectiveness	In providing environmental protection	Performance effectiveness	Policy performance – direct
	Efficiency	Does the measure achieve an outcome more efficient than an alternative measure	Performance efficiency	Policy performance – direct

Appendix 2 — Details of policy evaluation from Western Australian policy makers and interviews

Table 1: Summary of interview information on which policies were perceived to have been successful and unsuccessful

Environmental Policy	No Interviewees who perceived policy succeeded	No Interviewees who perceived policy failed	No Interviewees who did not refer to policy
Lakes EPP	8	1	6
EPA Land clearing Guidance	4	0	11
Kwinana air quality EPP	9	0	5
System 6	1	1	13
Guidance 33	2	0	13
Leeuwin–Naturaliste SPP	7	0	8
Bush Forever	3	1	11
Kalgoorlie EPP	4	0	11
Peel–Harvey SPP	7	2	6
FRIARS	1	0	14
Gas pipeline guidance	1	0	14
Greenhouse gas guidance	1	0	14
Cockburn Sound EPP	4	0	11
Western Swamp tortoise EPP	1	2	12
Ozone EPP	1	0	14
Gnangara Crown EPP	2	1	12
Odours Guidance	3	0	12
Risk guidance	1	0	14
Noise guidance (stationary)	2	0	13
Jandakot SPP	4	2	9
Wetlands EPP	1	2	12
Transport Noise guidance	1	1	13
Minerals and petroleum MOU	1	0	14
All EPA Guidances	1	0	14
Air quality	1	1	13
ERN SPP	2	0	13
Coastal SPP	1	0	14
Basic raw materials SPP	1	0	14
Poultry SPP	1	0	14

Environmental Policy	No Interviewees who perceived policy succeeded	No Interviewees who perceived policy failed	No Interviewees who did not refer to policy
WSUD policy	1	0	14
Shark Bay Strategy	2	0	13
Gascoyne	1	2	12
Gnangara SPP	1	2	12
Peel Harvey EPP	1	4	10
SW Ag EPP	0	6	9
Southern River Structure Plan	0	1	14
Industrial Buffers SPP	1	7	7
All coastal policies	0	2	13
Swan Canning EPP	0	6	9
Salinity	0	3	12
Kimberley Region Plan	0	1	14

Table 2: Summary of reasons given as to why the Lakes EPP was successful

Subject No	Quote	Paraphrased reason(s)
1	if we didn't have that policy there would be a lot less wetlands now and certainly the level of awareness about wetlands beyond just the EPP ones may not have grown either	Effective in protecting wetlands Raised awareness
2	No reason given	
3	Where they (EPPs) have been coupled to a normal on-going resourced activity within a Department, for example, the air ones and the Ozone one, and indeed the Lakes one because that was coupled with EIA, the EPPs have delivered.	Where a clear implementation process has been identified.
5	And the reason why it worked was because it was draconian, at a time where although there was a lot of sympathy for wetlands no one was really protecting wetlands... by far the majority of wetlands on the EPP have been protected because no one is prepared to touch them	A statutory policy with clear controls. Effective in protecting wetlands
7	The Swan Coastal Plain Lakes EPP was both a policy and a plan in a sense because it identified the areas that were to be protected, and that's way it was successful. But for its time, it set a benchmark, and this was what the review of it and upgrade to wetland was meant to be. You image doing the wetlands EPP back when the Lakes EPP was done. When you talking about things that weren't in the mindset of the broader community about what a wetland was, you've still got arguments about underground wetlands, or damplands as they call them	Clear policy in that areas to be protected were clearly identified. It was politically acceptable – it didn't go too far.
12	But at least it provides a framework within which the EPA can assess other wetlands initiatives	Provides a broader framework for wetland protection

Subject No	Quote	Paraphrased reason(s)
	It's put wetlands on the critical path in that they are a factor to be considered, and there is an analysis which must take place and you can't pass to the next step until you've finished that. So it's brought them up into the agenda.	Raised awareness about wetlands; Wetland protection part of decision making process
15	I think in terms of raising awareness and the need to consult over wetlands, that's been a really useful policy	Raised awareness about wetlands; Wetland protection part of decision making process

Table 3: Summary of reasons given as to why the Kwinana EPP was successful

Subject No	Quote	Paraphrased reason(s)
1	In term of improving air quality, when you look at what we had in the late 80s or the early 80s to what we have now the policy has been tremendously successful. I think the regime that it set up and the approach to licencing has been really successful in improving air quality is very measurable	Effective in improving air quality Clear regulatory process established
2	because they are precise and directed	Clear and targeted regulatory process established
3	Where they have been coupled to a normal on-going resourced activity within a Department, for example, the air ones and the Ozone one ... the EPPs have delivered	Where a clear implementation process has been identified
4	because I think there has probably been strong community support for it a strong political will to have something happen	Politically acceptable
5	Now that you have got the Kwinana industries through KIC relatively organised internally, it (the policy) works by itself. The industry negotiates, so really that's a relatively easy way for governments to manage things.	Clear implementation process has been identified that is industry self regulated
6	It's a policy which only affects a relatively limited number of proponents, the people inside the area and they've accepted it, whether they like it is another matter, but they've acceptable it, they work with it and it manages the situation	Limited in extent and scope – targeted.
9	because they were based on clear science and lines on the map	Good science and targeted scope.
12	I think when you look at the way that tried to protect a very complex buffer to a very large industrial area, the biggest in the State, I think is actually quite significant. The outcome has been that the State is now moved through, originating in the late 1980s, an area that obviously has had environmental problems associated with it, and the land use response has been to basically move residential land out of it. It took 10 years to get to that point, with a separate piece of legislation, but the origin was actually the EPP. I think that's been very successful	Caused a downstream decision making authority to make decisions that protected the environment.
14	You asked me did I think air quality in Kwinana has got better worse or unchanged, I would have thought that it has got better.	Effective in improving air quality

Table 4: Summary of reasons given as to why the Leeuwin-Naturaliste SPP was successful

Subject No	Quote	Paraphrased reason(s)
1	overall the framework and approach it set up will be viewed in the long term as being really good	Provides an overall framework for decision making
7	I think it has avoided a lot of future controversy. At the broad level across the whole region it said, “these areas need to be preserved for the following purposes, these are the limits of development in these areas, special rural in these areas because we want to preserve the character of the area”, that was its overall thing. And there was also additional lands bought into the National Park	Dealt with conflict. Provided clear prescriptions for land use
9	It showed a plan, and on that plan it’s got land uses where you can and cannot do things	Provided clear prescriptions for land use
10	An incredible amount of consultation. I mean, Leeuwin–Naturaliste started in 1994, if I remember rightly, with a workshop, or better described as a gathering, as I remember, upstairs in the Margaret River Hotel, with all and sundry. That was something that was very much driven by David Carr and the South–west regional Planning Committee at the time. And, it developed from there. The SPP wasn’t finalised until 1999. So, it was a 5–year process which is long by even the standard of some of our regional planning documents. But it took that length of time because of the amount of consultation. I think there was consultation before the draft. There was consultation on the draft and then there was more consultation before the final version. Because it, sort of, got converted from, what you might describe as a normal strategic planning document into a Statement of Planning Policy. Of course, Statements of Planning Policy have their own requirements for consultation. So, there was consultation all over the place. There were 3 or 4 periods formal periods of public consultation. The guys from up here as well as the Bunbury office they just spent hundreds of hours consulting. And I think because of that, and obviously because that consultation involved lots of stakeholders both at a group and in individual situations, they managed to get hold of the vast majority of the issues that needed to be addressed.	Adequate participation; A policy champion; Adequate time; Incremental policy development; Adequate resources.
11	It has bought some form, some consistency, and whilst there are difficulties in its application because of clashes in time with other planning instruments, it never the less has been effective	Guide to decision making and consistency of that decision making
12	it tries to reconcile all the various interests, identifies areas that should have a viticulture focus, identifies areas that have got a horticulture focus, identifies areas that have a conservation focus, and then areas where you can actually put development within certain guidelines. People talk a lot about a balanced approach towards Planning and development, but I think it’s an area where there was a legitimate attempt to do that, and I think it’s been pretty successful, as an overall framework. There is pressure on individual places within it, but I guess at a regional level you’re never going to solve all the local problems.	Provided clear prescriptions for land use; Balance approach
15	But I think they were quite genuinely trying to come up with an approach, an overall planning approach for that area because they saw that is turning into a dog’s breakfast. There was heaps of development pressure down there. I don’t necessarily agree with all of the outcomes but I think that that was a fairly genuine attempt. That overarching thing was not a bad attempt	Provided clear overall framework for land use decision making.

Table 5: Summary of reasons given as to why the Peel–Harvey SPP was successful

Subject No	Quote	Paraphrased reason(s)
2	It is the thing against which it will all be tested and that happened to be through an SPP ... which I think was quite a good blueprint for future action	Provides an overall framework for decision making
3	<p>I think they have certainly worked in a Planning sense, they have certainly had an influence and set directions in a Planning sense. How have they worked in terms of environmental outcomes, which is the probably behind your question?</p> <p>I don't know. Furthermore, I don't know if anyone can tell you. It's a bit disheartening, but I don't know anyone who can tell you the answer.</p> <p>... it has certainly worked in influencing lots sizes and lot density and the number of septic tanks per hectare etc, and it certainly has help influence land clearing and other things</p>	Provides an overall framework for decision making
8	That's partly because they were a response to an issue at the time, so there was a real need and purpose for them. But, also they were fairly clear in their objectives and policy measures, so there was a fair degree of clarity which meant that they were fairly readily capable of implementation	Responded to a real need. Provides a clear overall framework for decision making
9	It addressed the mechanism to take account of the environmental objectives. The environmental objectives were set out in the EPP and the SPP didn't have to detail all the environmental objectives, but it cross-referred to them and was a mechanism to take them into account.	Provides an overall framework for decision making that took into account the environmental objectives.
10	because by their nature, we have been quite deliberate in choosing what we have SPPs for	Targeted to a real need.
11	I presume by the length of time that is has been there and the reference I see to it in different publications or strategies that have unfolded over the years, such as the Peel Region Scheme, and you read the studies done in the 1990s in the South West development strategies or SWOT, those sorts of things you get a reference to it, so obviously people who are preparing things think it is sufficiently important to quote in recognition of the authorities they have had to consult	Referred to in other planning documents – influenced down–stream decision making.
12	I think the debate on the management of the Peel–Harvey catchment became more sophisticated after that particular SPP came out. And, it was probably a product of its time, I suspect. It probably needs to be looked out again in light of the Planning initiatives that have occurred the construction of the Dawesville cut, which the SPP actually predated. I think overall that was probably successful	Appropriate for the time.

Table 6: Summary of reasons given as to why the Peel–Harvey EPP was unsuccessful

Subject No	Quote	Paraphrased reason(s)
1	It is very hard for an EPP to force land use changes, particularly where the land uses changes that are trying to be implemented ... are not supported by private land owners. Forcing land use changes and conservation on private land is really hard	Tried to force land use changes on private land without political support
2	... it suffered from the implementation of it being so, by its very nature, diffuse it got a little bit difficult or the community wasn't involved enough or there wasn't ownership enough and I think the fact that Agriculture wasn't able to give it ongoing consideration with total amount of support from higher up the line because they saw it as not part of their core business eventually and it lead to difficulties	Imprecise. Lacked political support.
3	Anything that requires behavioural change at the landscape level is tough... The best examples are is where you have people out there working with the community on a personal basis, and they're the ones where we've had some quite good success.	Wasn't supported by resources of the relevant agencies.
5	Peel–Harvey started with very good intentions but has been completely, I think, undermined, probably by ignorance and being ignored. If the objectives of the EPP have been achieved it has been more by co–incidence, I believe, than making sure that all of the decision making authorities within the catchment are heading in the same direction. The other thing for Peel–Harvey is that there has been no investment by government. In fact, any investment they had has been largely withdrawn. The local presence through the Pinjarra catchment centre has gone, the centre has gone, and, in fact, the local people are saying that there is no support	Wasn't supported by relevant decision makers and lacked resources for implementation.

Table 7: Summary of reasons given as to why the SW Wetlands EPP was unsuccessful

Subject No	Quote	Paraphrased reason(s)
1	<p>It is very hard for an EPP to force land use changes, particularly where the land uses changes that are trying to be implemented ... are not supported by private land owners. Forcing land use changes and conservation on private land is really hard</p> <p>A minister that wasn't going to force a policy through unless there was land owner veto. You also had turf war happening between the agencies, and the whole thing is so watered down that in the end of the day you get one wetland in it, which I think is a nature reserve anyway. It's it going to sit on the shelf and be useless</p>	Tried to force land use changes on private land without political support.
2	<p>In so far as it again relies upon really nominations to produce an outcome, and it's not even seen by CALM as to be necessarily a way to go which provides greater protection, environmental protection, for their wetlands in their reserves in the area that's covered by the EPP.</p> <p>those that are diffuse, that don't have community and Government ownership as the piece of legislation required to give effect to a problem you're unlikely to get successful outcome</p>	Lacked agency and political support.
3	Where they haven't been directly coupled with another programme that's been resourced they haven't	Not supported by an implementation programme or appropriate resources.
4	But I don't think there is a strong community expectation or desire with it and I don't think there is any political support for it at all	Lacked agency and political support.
7	And all that was really presented to Government to sign off on the day was the problem not the solution ... And you've got the private land owners and developers out there saying, "you're going for my farm dam, you're going for my whole property, you're going for all the cleared palusplain – you can't do that. ... But the frustration I have always experienced is that when you get the case-by-case assessments, or the subdivision that comes in, you've no context within to ask, "well, how important is this?"	Lacked agency and political support and does not give clear guidance to decision makers.

Table 8: Summary of reasons given as to why the Industrial Buffers SPP was unsuccessful

Subject No	Quote	Paraphrased reason(s)
1	It doesn't work well for existing situations where all the difficult ones are it's a bit problematic.	Doesn't deal with the difficult problems especially existing land uses
4	It's so general. I think sometimes they avoid confronting the conflicting issues, which comes back to my other point about no processes for getting resolution between conflicting community requirements	Not specific and too general. Doesn't deal with the difficult problems, especially existing land uses
7	Obviously, there's problems there with efficiency of land use, as well as equity – who's paying for the buffer? Not such a big issue in a Greenfield situation because you are not impacting on what the range of uses are. Once you get into built up areas, then sometimes the spill over effects of someone's operation on someone else's land is at the cost of that adjoining land owner. A lot of those issues weren't teased out very well in the SPP, and, again, it didn't come up with solutions. It just said, "these are issues	Doesn't deal with the difficult problems, especially existing land uses
8	It is unclear both in its form and content and it. In many ways it attempted to be too broad, too far reaching by including not only industry but a whole range of infrastructure and activities that could have off-site impacts. By attempting to be too broad it became too general and of limited value	Not specific and too general.
9	Nobody understands what's in it. Everything is in it, because people said, "put in that, put in that". It's almost so difficult to know yourself what's in it even if you're close to it, you can use it for everything but on the hand that can be its undoing as well. It's got to be far more precise So, it needs to be fairly simple so they know where they stand. They can't be in a situation where basically they've got to read through 100s of pages of policy every time they come up with an application, they've got too much work to do	Too complicated
10	I think it's a bit unclear as to what it's trying to do	Unclear
11	it was pretty hard to arrive at anything which could be implemented reasonably	Implementation unclear

Table 9: Summary of reasons given as to why the Swan–Canning EPP was unsuccessful

Subject No	Quote	Paraphrased reason(s)
3	<p>Anything that requires behavioural change at the landscape level is tough</p> <p>... The best examples are is where you have people out there working with the community on a personal basis, and they're the ones where we've had some quite good success.</p>	<p>Wasn't supported by resources of the relevant agencies.</p>
5	<p>I wouldn't have a clue what it is. I think I know what it is trying to do but I cannot see that there is any programme in place to do anything about it ...</p> <p>Is just too broad, too general and isn't targeted in a way which tries to influence behaviour of particular decision makers, for instance. I'm not sure where the Planners see it, and yet they are a fundamental driver in terms of achieving your outcomes</p>	<p>Unclear.</p> <p>No implementation strategy</p> <p>Too general</p> <p>Lacks political support</p>
7	<p>If you look at the Swan–Canning, statement by statement, you can't disagree with it. What does it mean? How do you translate it? It's one of those problems that that policy is that it is meant to something that a whole lot of other Planners and people that do things take into account. But that ownership and recognition of EPPs being a tool for these people to use is not there.</p>	<p>Unclear</p> <p>No political support</p>
8	<p>Is very general. It relied, in terms of the implementation mechanism, on the preparation of a programme of actions which has not eventuated</p>	<p>Too general</p> <p>No implementation strategy</p>
14	<p>Probably that government hasn't implemented it. Without having it in front of me, the policy on its own doesn't, as I understand it, compel a programme of works, and the programme of works is the critical thing and that to me should come first</p>	<p>Lacks political support.</p> <p>No implementation strategy</p>
15	<p>I think that they haven't implemented that as much as they could do. I think that they are now getting the River Plan which was announced yesterday, they are taking that more seriously, but that hasn't been taken as seriously as it should have been.</p> <p>the Swan River one, there are so many agencies that are involved in the management of the Swan, and the Swan River Trust's jurisdictional area is really only the foreshore, and it has made it quite hard for them. I think, to really coordinate management.</p>	<p>Lacks political support</p> <p>No implementation strategy</p> <p>Lack of coordination between agencies</p>

Appendix 3 — A description of the Western Australian and Perth environment, as a background to a consideration of the relevant environmental policies (Chapter 5)

1. Introduction

This Appendix is a background to the discussion of environmental policy evaluation in the Western Australia given in Chapter 5. In that Chapter five EPPs, two SPPs and one Regional Strategy currently being reviewed or recently reviewed were analysed, being:

- Environmental Protection (Goldfields Residential Areas) (Sulphur Dioxide) Policy and Regulations 2003, which replaced the original EPP Gazetted in 1988;
- Environmental Protection (Kwinana) (Atmospheric Wastes) Policy and Regulations 1999, which replaced the original EPP Gazetted in 1992;
- Environmental Protection (Ozone Protection) Policy 2000, which replaced the original EPP Gazetted in 1992;
- Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 now to be called the Environmental Protection (Swan Coastal Plain Wetlands) Policy;
- Environmental Protection (Peel Inlet – Harvey Estuary) Policy 1992;
- Gnamagara Groundwater Protection SPP;
- State Industrial Buffer SPP; and
- The Gascoyne Coast Regional Strategy.

It was noted in Chapter 5 that some readers may be unaware of the nature of the environment in Western Australia and Perth, and a detailed description would be useful to help understanding. This Appendix provides that background. As well, this Appendix contains some background information for each of these eight policies.

2. Geology and geomorphology

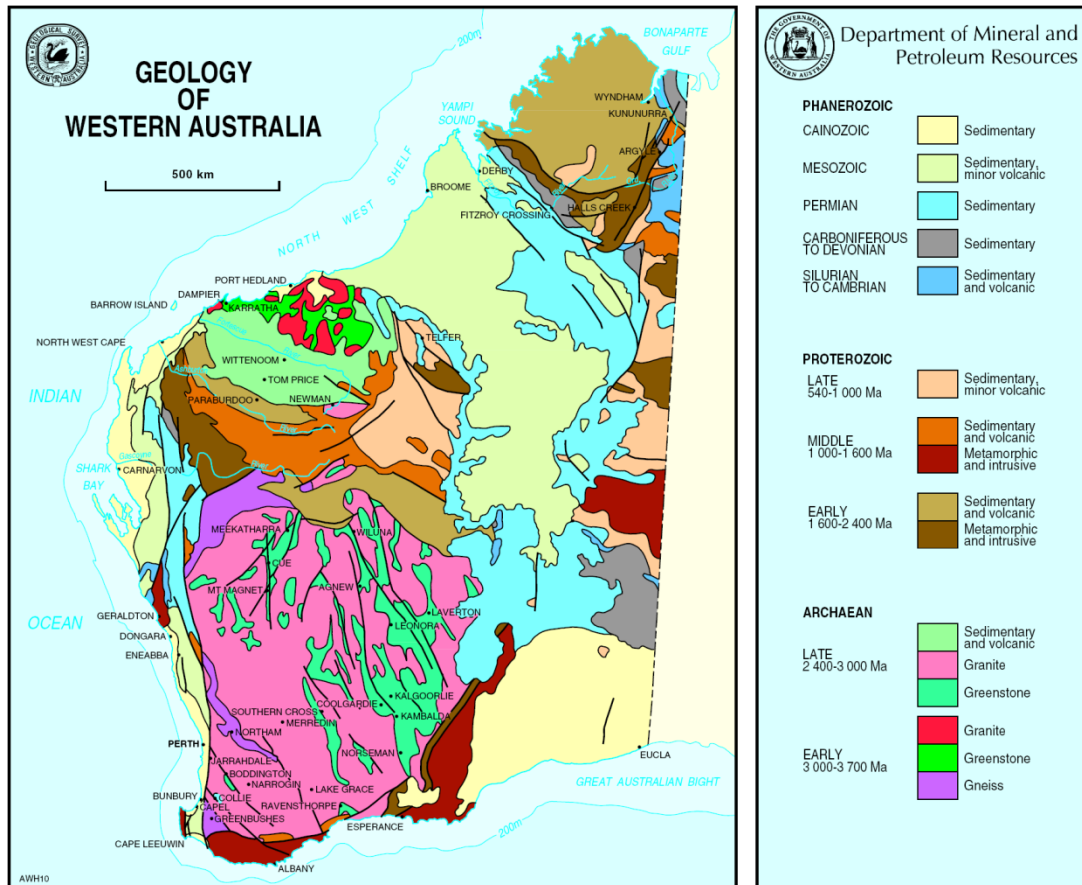
The geology of WA can be summarised as consisting of two very old granite based blocks (over 2.6 billion years) found in the east and central areas, overlain in places with coastal sedimentary basins of more recent age (440 to 150 million years): some of these sedimentary have been metamorphosed. In the coast zone there are a series of recent coastal dunes overlaying these dominant features. The majority of WA's population lives in the coastal region on the west and south–west coastal areas, which is the focus of the remainder of this discussion.

The western and southern edges of the granite blocks have been highly active shear zones with many fault lines, the most notable being the Darling Fault. The Darling Fault runs for about 1,000 kilometres, from just north of Shark Bay, east of the Perth metropolitan area to south of Cape Leeuwin generally parallel to, and several kilometres inland from, the existing coastline in the north (Figure 9). It is considered to be one of the largest geological structures in Australia.

The Darling Fault line became active about 200 million years ago when significant vertical movement occurred. Sea level changed several times since that time which contributed to the build up of sediments west of the Scarp and a changing coastline growing gradually westwards. This sedimentary basin is called the Perth Basin, which is about 1000 km long, 65 km wide and up to 15 km deep. This basin extends out to the sea beyond the current coastline, and has been covered by more recent sediments at and near the existing coastline. Another sedimentary basin, the Carnarvon basin, adjoins the Perth basin at its northern extension.

About 3 million years ago, a new era of coastal sedimentation occurred resulting in a series of coastal plains overlying the sedimentary basins and the granite blocks. The most significant of these coastal plains is the Swan Coastal Plain which lies over the top of the Perth Basin. The Swan Coastal Plain is a combination of sand and sediment that has been washed down from the granite land forms to the east or deposited from the ocean. The Plain in its entirety extends from near Geraldton in the north to Dunsborough in the south (Figure 9). Most of the Perth metropolitan area and the outer urban areas are located on the Swan Coastal Plain. In the near Perth Region, the Swan Coastal Plain's eastern boundary is the Darling Scarp, approximately 25kms from the coast.

Figure 9: General geology of WA. Source: Geological Survey of Western Australia website.

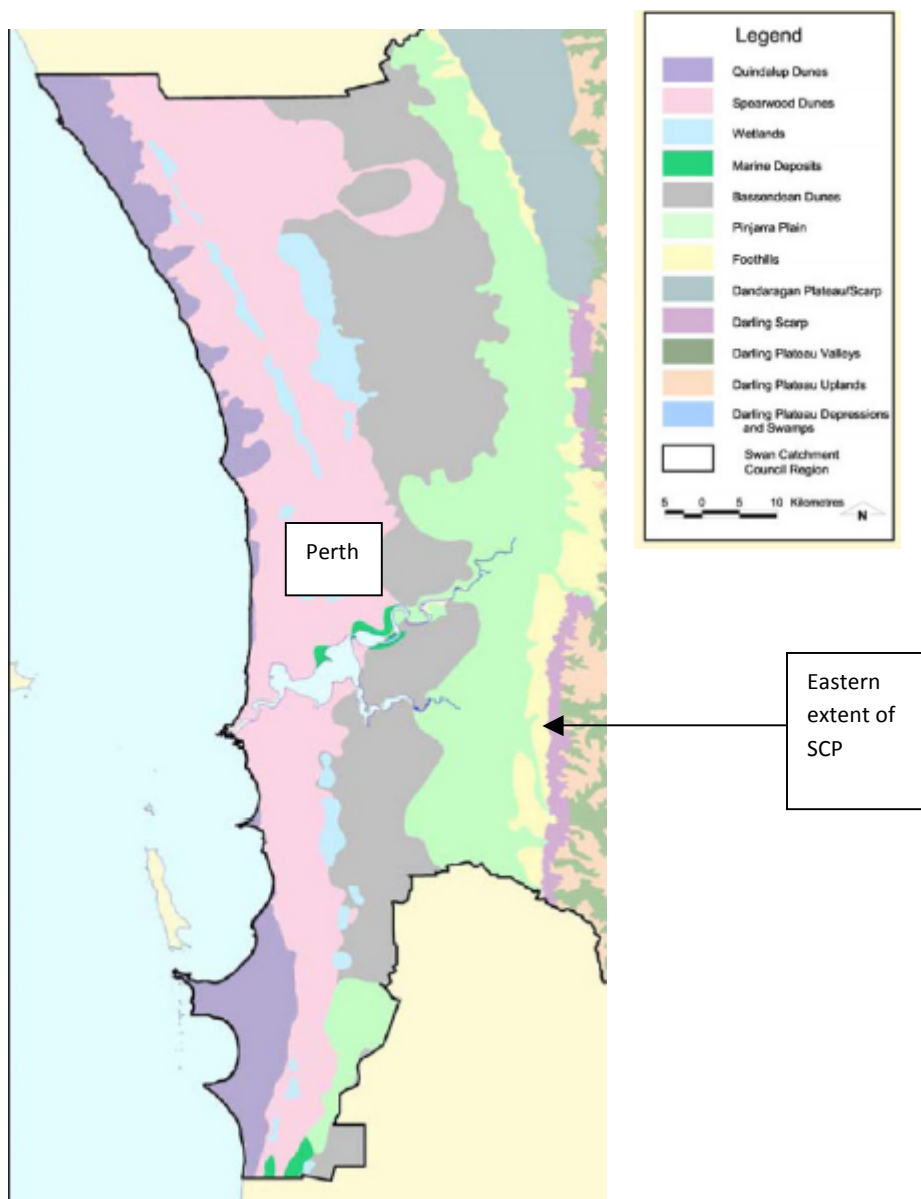


The Swan Coastal Plain has four geomorphic units running roughly parallel to the existing coastline, increasing in age from the coast (Figure 10). They are:

- Quindalup Dunal system – 0–10,000 years old (Holocene Era) made up of cream coloured calcareous sands. There is a significant Quindalup dunal system in Rockingham area is called the Becher Plain and tends to be a low lying series of dunes parallel to the coast;
- Spearwood Dunal system – 10,000–2 million years old (Pliocene Era), made up of yellow brown sands or varying thickness over Tamala limestone. Where there has been no recent accretion (i.e. forming Quindalup dunes) the limestone is at the coast (e.g. Burns Beach). This system extends several km off shore and forms chains of islands and reefs running parallel to the coast. The limestone point at Cape Peron is also part of that chain. (Note: as discussed above, this is similar to the limestone landform at Leeuwin–Naturaliste).

- Bassendean Dunal System – likely to have been formed in the late Pliocene Era (2 million years ago). The dunes tend to be gently undulating made up of well bleached white–grey sands; and
- Guilford Formation or Pinjarra Plain – this is a lowing lying, flat area made up of a mixture of sand and clay which is a combination of material washed off the Darling Scarp to the east and material blown inland from the dunes in the west. The clay nature of these soils and the generally low relief means that they are naturally poorly drained and hold surface water for most of winter.

Figure 10: Geomorphology of the Swan Coastal Plain in the Perth Region (Source: Swan Catchment Council 2004)



Most of the rain that falls on the sandy Quindalup, Spearwood and Bassendean dunes infiltrates through the soil structure rather than runs off the surface. The presence of clay and other impervious material close to the surface traps the water infiltrating through the soil close to the surface and produces a series of superficial groundwater aquifer that underlays these dunes. This groundwater discharges to the ocean to the west or to one of only a few watercourses that dissect the Swan Coastal Plain. In winter, the rate of recharge is greater than the rate of discharge causing the aquifers to mound in several places, the most important being the Gnangara (just north of Perth) and the Jandakot (just south of Perth) mounds. These aquifers are also exploited for a range of commercial uses (e.g. horticulture) and public water supply.

The water table of the superficial aquifer is very high in many places, particularly in winter, and many of the swales between the dunes are low enough to have the water table at or near the surface for all or part of the year causing the formation of many freshwater wetlands.

Whilst most of the rain that falls on the Swan Coastal Plain infiltrates through the soil, there are a number of significant seasonal water courses (rivers) that cut across the plain. The majority of the catchments of these rivers are from the granite based landforms to the east of the Darling Scarp. These rivers act as discharge features for the superficial ground water. Two significant rivers pass the Perth area – the Swan and Canning. These join into one wide tidal estuary near the CBD.

3. Climate

The vast size of WA means there are four distinct climate zones: tropical summer monsoon zone in the very north (Kimberley); cyclone prone areas that are otherwise hot and dry in the coastal areas south of the Kimberley (Pilbara and Gascoyne); temperate climate with dry summers and winter rain (South West and south coastal); and hot dry arid interior (State of the Environment Reporting Unit 1998). Over two thirds of the State receives less than 250mm annually.

4. Conclusion

The majority of WA's population lives on the Swan Coastal Plain in the south west of the State: consequently, most of the environmental problems occur in this region. The sandy nature of the soils, the presence of superficial groundwater, the seasonally rainfall and a range of inappropriate land uses have lead to a range environmental problems. These problems have driven many of the environment policy making initiatives in WA. Other environmental problems have arisen as a result of modern industrialisation, mostly pollution related. Many of these environment policies are the subject of discussion in the following sections.

5. Background to the Environmental Protection (Goldfields Residential Areas) (Sulphur Dioxide) Policy and Regulations 2003

The Goldfields residential area cover the Kalgoorlie–Boulder area, some 600km east of Perth, the capital City of WA (Figure 11), with a population of around 30,000 (WAPC 2002). The Goldfields area refers to the land surrounding and including the Kalgoorlie–Boulder residential area, which is rich in gold deposits. Gold mining in the area dates back to the late 1890s. Today the Kalgoorlie–Boulder area is the centre of gold roasting for the area. Nickel is also mined and roasted in the area. Kalgoorlie–Boulder has one large gold roaster and one nickel roaster.

The gold and nickel ores contain high levels of sulphur, and the roasting process (essentially heating ores concentrates to 600 °C in air) produces sulphur dioxide (SO₂). SO₂ acts directly on the human respiratory system causing coughing, wheezing and shortness of breath, and can also cause damage to buildings and natural ecosystems (Department of Environment 2003). The levels of SO₂ in Kalgoorlie–Boulder’s atmosphere became a concern in the 1980s leading ultimately to statutory controls over emission levels through the EPP.

6. Background to the Environmental Protection (Kwinana) (Atmospheric Wastes) Policy and Regulations 1999

A full history of the environmental problems at Kwinana is described in Chapter 5, and only a brief overview is provided here. Kwinana is the major heavy industrial area in WA, and is located some 35kms south of Perth. As with many heavy industrial areas throughout the world, air quality in and near the industrial area can be poor and below acceptable standards. At Kwinana, SO₂ has been the most significant air quality issue. In the late 1970s Government agencies began to raise concerns about SO₂ levels, with the main sources being a power station and an alumina refinery burning heavy oil with high levels of sulphur, and an oil refinery (WAPC 2002).

Two scientific studies were initiated in the 1970s and early 1980s to look at air quality in Kwinana and two of the industries that were the source of SO₂ emissions significantly reduced their emissions by changing fuel source to natural gas (the power station) and by installing sulphur recovery technology (the oil refinery). Despite these changes and initial improvements in SO₂ levels, the concentrations of SO₂ experienced in nearby residential areas began to rise again in the late 1980s (EPA 1999). The EPA responded to this by initiating an EPP for Kwinana, which was finally Gazetted in 1992.

7. Background to the Environmental Protection (Ozone Protection) Policy 2000

Ozone (O₃) gas is found in the upper levels of the atmosphere and has an important role to play in controlling the levels of ultraviolet (UV) radiation reaching the Earth’s surface. Ozone

absorbs the ultraviolet radiation producing oxygen gas and a free radical oxygen atom. The free radical oxygen usually finds another free radical atom producing another oxygen molecule. In this way, the amount of UV radiation striking the Earth's surface is minimised. Increased UV radiation reaching the Earth can cause a range of impacts including increased rates of skin cancer and cataracts, impaired immune systems in humans, damage to forests and aquatic species, and to a decrease in crop yield (De Winter-Sorkina 2001).

Certain industrial chemicals when released into the atmosphere also react with ozone, reducing the amount of ozone available to absorb UV radiation. The most notable of these chemicals are Chlorofluorocarbons (CFCs), which were extensively used in refrigerators until the late 1980s. Whilst concerns were raised by some scientists in the 1960s about the impact human activities were having on the ozone layer, it wasn't until the mid 1970s that the scientific community as a whole supported these concerns and sought political action to halt the decline (Rowlands 1993). In the early 1980s, some countries took unilateral action to reduce the release of CFCs, and in 1985 the first international agreement was drawn up – the Vienna Convention for the Protection of the Ozone layer. This was a voluntary agreement, but in 1987 the first binding agreement was signed by 27 countries, including Australia – the Montreal Protocol. This was a limited agreement based on the science of the day and was restricted to reducing the release of certain CFCs by 50% by 1999. By 1992, it was clear that more rapid action was required and that other substances had to be controlled. This led to significant review of the Treaty, including a 100% reduction of CFCs by 2000, and this time 80 nations signed up.

In 1989 the (then) Australia Environment Council adopted a national strategy for Ozone protection providing a timetable for the phasing out of ozone-depleting substances in Australia. WA was the first State to ban use of ozone-depleting substances through a ban on CFCs in certain aerosols through the Environmental Amendment Regulation, 1988. This was followed by an EPP in 1989, originally titled Environment Protection (Ozone-Depleting Substances) Policy, which was reviewed in 1993 and then again in 2000.

8. Background to the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 now to be called the Environmental Protection (Swan Coastal Plain Wetlands) Policy

Protection of wetlands has been a high priority for the EPA since its inception in 1971 (EPA 1993). Up until the early 1990s, the EPA adopted an informal approach to wetland protection through the adoption of non-statutory policies. However, in 1991, in response to the continued loss of wetlands, the EPA decided to produce an EPP to ensure that:

No more filling in, mining, excavation, pollution or changes in drainage capable of reducing or destroying the values of wetlands on the Swan Coastal Plain will take place than is absolutely necessary.” (EPA 1991:1)

The EPP was finalised in December 1992 and was titled “Environmental Protection (Swan Coastal Plain Lakes) Policy”. The use of the word lakes in the title reflects the type of wetland that was protected under the EPP. Wetlands (lakes) covered by the policy were selected

for inclusion in this policy on the basis that they consisted of areas of standing water of 1 000 square metres or more as at 1 December 1991. (Government of Western Australia 1992:100)

Wetlands that have a full or nearly complete coverage of vegetation (swamps) were not picked up by this EPP.

9. Background to the Environmental Protection (Peel Inlet – Harvey Estuary) Policy 1992

The Peel–Harvey estuary is situated on the Swan Coastal Plain approximately 75 kms south of Perth, and is important for a range of ecological and human purposes. It is a significant habitat for waterbirds and is listed under the Ramsar Convention. Most of the Swan Coastal Plain portion of the estuary is flat lowlying land with the high watertable at or near the surface. Consequently, development of the catchment for agricultural purposes required a significant drainage network. There are now some 1,400 km of drains in the catchment on the Swan Coastal Plain (Kinhill Engineers Limited 1988). The drainage system substantially increased the volume of water entering the estuary. In addition, the sandy nature of these soils on the Swan Coastal Plain meant that much of the fertilizer applied to the soils to enhance crop growth was not easily assimilated into the soil structure and ended up in the groundwater, and subsequently in the estuary via the drainage system. The poor flushing in the estuary meant that nutrients began to accumulate in the sediment and water column.

It wasn't long, therefore, before the estuary began to show the signs of nutrient enrichment – excessive algal growth. The earliest recording of excessive algal growth was probably in 1946 and was likely to have been a “macro–algae” species (Hodgkin et al. 1980). This algae was mostly of nuisance value as it tended to float on the surface and clog fishing nets and boat propellers.

By the late 1960s macro–algae became less dominant and a *Cladophra* species became more prevalent. This species provide more than nuisance value as it washed up on the beaches and created a foul smell as it decomposed. During the 1970s another algae species began to be observed in greater quantities: *Nodularia*. This is a green–blue algae species which is known to be toxic. The occurrence of this species and the community concern it generated, forced government agencies to recognise that the estuary's health was in poor shape.

From the 1980s onwards, the EPA became involved in the management of the estuary and its catchment and the development of a range of policy responses, including the

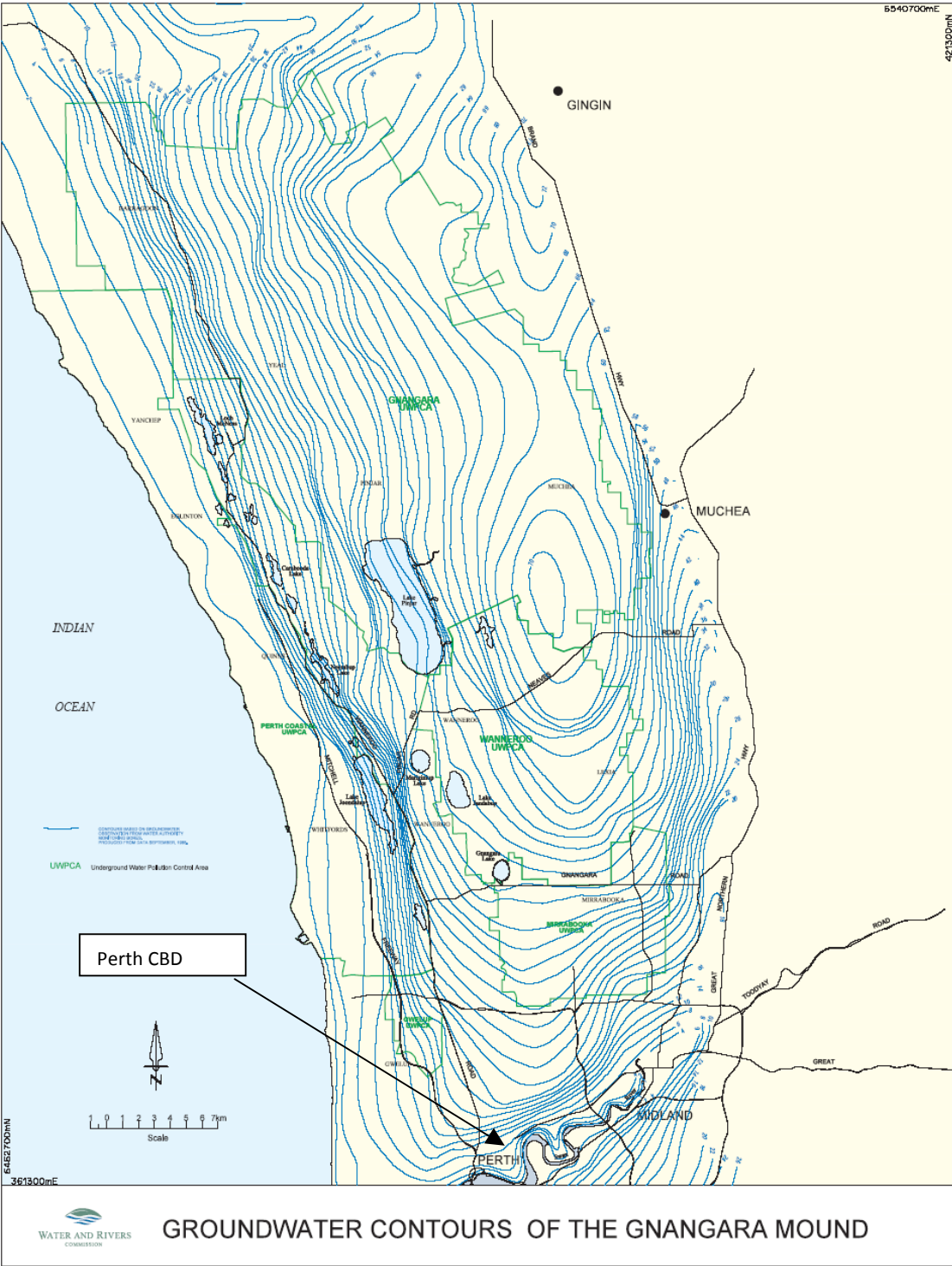
development of an EPP in 1992. The EPP was part of a range of statutory measures affecting both private land owners and Government agencies in the catchment. The main other statutory mechanism was a comprehensive set of Environment Conditions set by the Minister for the Environment in 1989 on the advice of the EPA to apply to relevant Government Ministers and their Departments to ensure the protection of the estuary.

10. Background to the Gnangara Groundwater SPP

As noted in Section 5.2.2, most of Perth is located on the sandy Swan Coastal Plain. Underlying the plain is a series of superficial groundwater aquifers that mound in certain places when the rate of recharge through infiltration from rainfall is greater than the rate of discharge to the ocean and major watercourses. Groundwater makes up over 50% of Perth's water needs, both private and public water supply (Water and Rivers Commission 2001). The most significant of these is the Gnangara mound, in the northern Perth region (Figure 11). The Gnangara mound covers 2,200 square kilometres, contains an estimated 25.6 billion kL of water, and receives around 320 million kL of recharge each year, of which 200 million kL is used privately and 79 million kL used for public water supply (WAPC 2001).

Figure 11: Location of the Gnangara Mound. (Source: Water and Rivers Commission Website)

www.wrc.wa.gov.au/protect/Gnangara/gnan_gwcont.pdf



These aquifers are extremely vulnerable to pollution because of the sandy nature of the spoils that make up the Swan Coastal Plain. These soils do not easily retain any chemicals that end up in the soil (e.g. through fertiliser and herbicide application). Consequently, when

water falls on the soils through rain or irrigation, these chemical are readily carried through the soil structure, ending up in the aquifer.

The majority of the land over the central part of the mound is government owned (Crown land), whereas most of the land on the fringes of the mound is privately owned. The main land uses are forestry and conservation. The original SPP that applied to the Gngangara mound was titled "Statement of Planning Policy No 3 – Gngangara Mound Crown Land" and was Gazetted in 1992 to apply, as the name suggested, to Crown land only. It was produced to complement the EPA's Gngangara Crown Land EPP, in recognition that there were many significant and use planning the implications associated with the EPP.

Controls are also needed on the private land areas of the mound that would also be used for abstraction of groundwater, either now or in the future. As mentioned earlier, the EPA initiated an EPP for private land, but was never finalised (EPA 1992). Protection of groundwater in Perth became a significant political issue during the 1990s, culminating in a Parliamentary Select Committee report released in late 1994 (Western Australian Legislative Assembly 1994). Among other things, the Select Committee recommended that:

A Land Use and Water Management Strategy be produced for the Gngangara Mound. This strategy should be produced through a 'whole-of-government' coordinated approach... (Western Australian Legislative Assembly 1994:286).

The government endorsed this approach which effectively put an end to the need for an EPP on private land. Instead, the WAPC released a draft Gngangara Land Use and Water Management Strategy (GLUWMS) in 1999 (WAPC 1999), which was finalised in 2001 (WAPC 2001).

11. Background to the State Industrial Buffer Policy

A buffer around an industrial area can be defined as:

all the land between the boundary of the area that may potentially be used by an industrial land use, and the boundary of the area within which unacceptable adverse impacts due to industrial emissions on the amenity of sensitive land use are possible. (EPA 2004:12)

It is the area of land around and industrial plant or estate where impacts could be unacceptable for sensitive land uses, including residential. The first formally declared buffer was for the Kwinana industrial area, which was reflected in the Kwinana EPP (above). There were a number of other land uses that were of concern to the EPA because they were producing impacts beyond the boundary of the operations, notably poultry farms, market gardens, wastewater treatment plants and rendering works plants. In the early 1990s, the, then, Department of Environmental Protection began work for the EPA defining recommended separation distances between a range of these types of land uses and residential areas. The purpose of this work was to avoid situations where residential areas and located near potentially polluting land uses, and was to be in the form of advice to the

planning agencies, notably the WAPC, when making land use planning decisions around these types of land uses.

Not surprising, the WAPC became interested in this work and decided to produce a SPP to provide a policy framework for its own decision making and that of local government. This SPP (titled State Industrial Buffer Policy) was Gazetted in May 1997 (WAPC 1997), which was followed by the release of a draft EPA Guidance Statement (titled Industrial–Residential Buffer Areas, Separation Distances) (EPA 1997).

12. Background to the Gascoyne Coast Region

The Gascoyne coast is in the far north–west of WA. It extends around 400 km from Exmouth to Carnarvon (Figure 12). This coastline is a nationally significant tourism area (Ministry for Planning 1996), because of the variety and quality of the natural features found there. The significant natural feature is the Ningaloo reef, a coral reef around 270 km in length in the northern section of the Gascoyne coastal region, and is the largest fringing coral reef in Australia (EPA 1999). Ningaloo reef is particularly important because it is located relatively close to the shore forming an enclosed, narrow and relatively shallow lagoon varying in width from 200 m to 6 km and with an average depth of only 4 m (Preen et al. 1997).

Figure 12: Gascoyne coastal region. (Source: Department for Planning and Infrastructure 2003)



The area has a number of significant coastal environmental planning issues, including:

- Impacts from illegal and uncontrolled camping;

- Sustainable fishing takes from both recreational and commercial fishing;
- Management of existing settlements and provision of infrastructure (water, power and treatment of human effluent) because of growing tourism numbers;
- Protection of high conservation areas including terrestrial national parks and Ningaloo reef;
- Roads;
- Sustainable agriculture on pastoral stations; and
- Cyclones and flooding.

The WAPC produced its first regional strategy for the area in 1996 (Ministry for Planning 1996) titled "Gascoyne Coast Regional Strategy". In the late 1990s, the Shires of Carnarvon and Exmouth received funds from the Commonwealth Government to review the southern portion of the 1996 strategy: a draft strategy was released for public comment in 2001 (SMEC Australia P/L 2001). This draft strategy proved to be highly contentious with over 1200 submissions received made up of 296 individualized submissions, 6 different form letters signed by from 343 different people and 4 petitions signed by 605 people. In response the WAPC intervened and took over the review, which became the Carnarvon–Ningaloo Coast Regional Strategy and covered the entire area of the 1996 strategy (Department for Planning and Infrastructure 2004). A discussion paper titled "Future Directions: Sustainable Tourism and Land Use Scenarios for the Carnarvon–Ningaloo Coast" preceded the draft strategy (Department for Planning and Infrastructure 2003).

As one of the policy makers involved in the reviews noted:

I think the Gascoyne Coast strategy ... as it happens, that's to all intents and purposes being reviewed at the moment through what started off as the Carnarvon Coastal strategy, but that's really now transforming itself into what it, for all intents and purposes, a review of the Gascoyne Coast strategy

Appendix 4 — Details of the criteria interviewees identified for good policies and policy making

Policy/subject	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
Good science/information	1	1	1	1	1	1	1	1	1	1		1		1		12
Policy champions	1	1		1				1		1		1		1	1	8
Resources	1		1	1	1		1		1	1		1			1	9
Political Stakeholder acceptance/support of issue	1	1	1	1		1	1		1			1	1		1	10
Appropriate trade-offs	1															1
Doesn't dominate agenda	1															1
Conflict management/not avoidance	1			1				1			1	1		1		6
Clear & limited scope precision		1			1		1	1	1	1	1	1		1		9
Contradiction between Government policies		1														1
Timing			1		1			1		1					1	5
Consultation			1	1	1	1	1	1	1	1	1	1	1	1	1	13
Negotiated outcomes			1			1		1								3
Economic stability not threatened			1													1
Clear and simple methods of measuring effectiveness			1													1
Right tools for policy (content)			1					1	1							3
Interagency and stakeholder cooperation				1			1	1			1				1	5
Equity for all stakeholder					1				1			1		1		4
Crisis					1	1										2
Ownership by stakeholder					1		1			1						3
Implementation thought through					1	1	1	1	1	1		1		1	1	9
Education					1							1				2

Policy/subject	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
Actions prioritised					1					1						2
Incremental approach						1	1	1	1	1	1			1		7
Skilled policy makers						1										1
Trust						1	1								1	3
Capacity building						1									1	2
Learning						1		1							1	3
Policy agency controls implementation							1									1
Incentives							1									1
Relationship to higher order policy								1							1	2
Readability								1								1
Influences decision making								1				1			1	3
Consistent structure									1							1
Prescriptive										1		1				2
Clear reason for doing it										1		1				2
Actions measurable										1						1
Action orientated										1						1
Tiered approach											1					1
Manageable size of steering group											1					1
Representativeness of steering group											1				1	2
Local office												1				1
Within mandate												1				1
Flexible													1	1		2
Encourages innovation													1	1		2
Thought through													1			1
Takes into account development processes													1			1
Not fixed at start of policy making process													1			1
Consistent application and interpretation														1		1
Clarity														1		1

Policy/subject	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
Transparent process														1		1
Monitoring														1		1
Reporting structure – accountability														1		1
Simplicity														1		1
Innovation encouraged														1		1
Cooperative approach														1	1	2
Fun														1		1
Intellectual														1		1
Relevant to ordinary person														1		1
Draw on similar examples														1		1
Adaptive approach														1		1
Crisis															1	1
Decision sharing															1	1
Technical help for community															1	1

Appendix 5 — Discussion of the remaining attributes of successful policy making noted in Table 12, Chapter 5 not discussed.

Political & stakeholder acceptance/support for issue

Overview – linking political and stakeholder support as a single issue

It could be argued that this attribute is really two separate attributes of political support and stakeholder support, and a couple of interviewees made that clear distinction, as reflected in the comments below, where the first interviewee refers to the policy stakeholders whereas the second clearly refer to the politicians who have to approve the policy at the end of the process.

Probably the reality is that unless you get reasonable acceptance often the policies don't deliver, or that they get so cut down that they can't deliver on what their original objectives were ... And I guess the more we think and talk about it probably that stakeholder acceptability is pretty critical. The more I think about it the more important that is going to be.

That you've got political commitment to it ... If you look at the Public Drinking water (policy), it was highly important and influential. What we did in implementing the recommendations was pretty easy really. We didn't have to worry about policy commitment at the top end of government, because it was given down from there.

Most, however, used both stakeholder and political support as a single attribute and did not make a clear distinction, for example

I think for policies to be effective it's difficult if you don't have strong community expectations or desires and you don't have strong political support. I think that they're fairly important things upfront.

One of the key reasons why stakeholder and political support were seen as strongly linked was that political support is often predicated on stakeholders providing their support. The politicians are usually the final decision makers for a policy and will be very sensitive to community views, usually expressed as the views of key stakeholders.

Differences between professional policy makers and community views

Many of the interviewees who identified political and stakeholder support as being linked were professional policy makers, and can be seen as primarily about getting the policy finally agreed to, for example:

And so it has to have Ministerial backing. It has to really have community and government backing, because, you know as well as I do, that an EPP is like a piece of legislation it has to go through, well the normal practice is that the Minister will take to Cabinet. And you know the way Cabinet works, it almost works on the power of veto, and if somebody says “no no, not on your life” then it goes back again and it will sit there, not necessarily rejected, but just simply sits on the shelf, and so on and so forth.

The other key element is the ability of the policy makers to deal with the conflict. Conflict management came up in my work as being really, really critical. If you don't deal well with the conflict, you can have policy that avoids, that has low conflict it's a lot easier to be successful. But you generally find that the low conflict policies are the motherhood ones that are arguably not that effective anyway. Dealing with the conflict I think is, and it gets back to stakeholder acceptance.

The community however, tended to put as much focus on the getting support for the policy once operational (as well as getting agreed to in the first place), for example:

I think one of the key things is political commitment to the outcomes through the allocation of resources but meaningful commitment. So that people are confident that if they are in place they will be enforced.

This difference in view is probably not surprising because many of the professional policy makers are not involved in implementation whereas the community has an interest in both policy making and implementation.

Policy implementation and policy failure

Some interviewees saw the lack of stakeholder support for policy implementation, mostly from key agencies, as a key reason for policy failure, despite there being some initial agreement that the policy should proceed, for example:

this is part of the reason for the failure, divided responsibility for it. I think that's probably the simplest explanation for the failure of it. You've had different agencies responsible for different bits of it, and you haven't had a willingness for the agencies to cede ground to the other agencies. “Blow the Ag Department, we won't help them, we're in charge of this.” Turf war sort of stuff.

This turf war issue was raised several times by the community interviewees. It was also evident that there was tension between the EPA policy makers and those from the WAPC, particularly where there was an overlap between environmental policies and planning. This was evident in both the Western Swamp Tortoise and Wetlands EPPs cases. The South–West Agricultural Wetlands EPP was singled out by several interviewees as a particular example of turf wars preventing successful policy making. For example:

with the Ag wetlands one, there is a jurisdictional competition or conflict between agencies as well. And I know that over the Agricultural one there was a heap of discussion between agencies about it.

You also had turf war happening between the agencies, and the whole thing is so watered down that in the end of the day you get one wetland in it, which I think is a nature reserve anyway. It's it going to sit on the shelf and be useless

The fact that these tensions emerged at the implementation stage suggests that inter–agency conflict had not actually been dealt with, but had been put to one side so as to get the policy approved, suggesting an on–going governance conflict.

Ignoring the political context

A couple of interviewees expressed concerns that some professional policy makers tended to work in isolation and either ignored, or were unresponsive to, the socio–political context within which the policy is being formulated. For example:

I'm all for the view that things will be done in orderly fashion if indeed it has the direction from the political masters rather than bureaucrats trying to decide their own agendas. That's not to say the fact that political people have to do everything but things will work if indeed the whole of government wants it to work. If in fact you simply have it being a view down the line somewhere that thing should work, then it's more difficult.

This suggests that some interviewees see some policy makers as focusing too much on the environmental aspects of a policy and avoiding the broader socio–political context within which the policy is being formulated. This view was typically expressed by interviewees who were not the professional policy makers or were policy makers from another agency. It may be that this view is a criticism of the policy making practices of the EPA.

Conflict management and getting stakeholders support

This criticism of ignoring the political context could also be interpreted as policy makers not addressing the conflict that arises as part of the policy making process. This focus on the environmental aspects by policy makers means that broader concerns raised by other stakeholders are not given adequate attention. This is a refinement of the observations made in the previous section (science and information). It was noted there that some policy

makers are of the view that science is the key to good policy making and that all that is needed is a better informed public and any existing conflict will disappear. For example:

The other key element is the ability of the policy makers to deal with the conflict. Conflict management came up in my work as being really, really critical. If you don't deal well with the conflict, you can have policy that avoids, that has low conflict it's a lot easier to be successful. But you generally find that the low conflict policies are the motherhood ones that are arguably not that effective anyway. Dealing with the conflict I think is, and it gets back to stakeholder acceptance

Here, the environment is seen in scientific terms with minimal consideration to any of the social values or interpretation of science or the environment.

Enlisting agency support

Several interviewees argued that it was important that the agencies that will have to implement the policy as downstream decision makers support the policy. For example:

maximise your ownership, particularly of those people who are either going to be positively or negatively affected by the policy. I mean, if they can own it, then you'll get a much better compliance and implementation of it.

And of course that includes the consumers, but also the people who are going to perhaps make it happen if there is a development involved, the people who are going to make the development happen and work.

Local government was identified by some interviewees as being particularly important as downstream decision makers for SPPs, for example:

... then making sure that the local authorities are directly involved and support it. I mean, they don't have to support every last letter of it ... but you would like to think that through their involvement in the preparation of the SPP that they have a high degree of ownership to help to implement and interpret it.

It was generally accepted that enlisting these agencies' support was critical in getting a policy implemented.

Resources

The nine interviewees who raised the resource issue represented both the policy making approach views ('schools'), and there was very little to differentiate the responses. The resource issue was raised in relation to why policies fail (i.e. a lack of resources) and why others succeeded (i.e. adequate resources given to them). For example:

I think you got to resource policy development reasonably. One of the best ways you can set yourself up for failure is to come out with a grand plan for policy and not resource it because it will soon unravel.

And, at the end of the day, the hard questions will come back to government and saying, “one of the reasons why is because we haven’t got the resources to do it”, or “we haven’t got the information to deal with it”, which is another resources question.

So it’s resources to develop them in the first place, resources to implement and commitment to implement.

As the last interviewee noted, the resources issue is about two aspects: policy development and implementation. For the most part, interviewees noted that the resource issue for policy development was about resourcing participation, for example:

And you have also have got to very strongly support the community’s participation. I mean actively support. I don’t mean just have consultative committees and meet once every quarter. You have got to actually involve the community in a real sense, which might mean that you actually fund something. You fund their participation

So, there was consultation all over the place. There were 3 or 4 periods formal periods of public consultation. The guys from up here as well as the Bunbury office they just spent hundreds of hours consulting. And I think because of that, and obviously because that consultation involved lots of stakeholders both at a group and in individual situations, they managed to get hold of the vast majority of the issues that needed to be addressed.

Overall, there was a generally accepted view that adequate resources were need to enable policy success.

Clear & limited scope

This attribute covers two broad topics: successful policies tend to be those which are written in a very clear and precise way (the policy document is clearly written); and, the policy scope has clear limitations, either in relation to the issues covered or the geographic extent it is applied to. Again, the nine interviewees were from both policy making approach schools. Typical responses were, on successful policies:

Clarity and precision: they’re very important considerations. You have to spell out clearly what you mean and what the policy is about.

you actually have to have a policy which is clear and targeted ... And so you need to have a very clear problem which is very targeted in terms of solutions with a set of deliverables which you can be confident of doing.

They have been successful because there is a degree of precision about the outcomes. They are more than United Nations Statements. They've actually got with them a requirement to work and a sufficient identification of how they're going to work, and sufficiently focused for them to work.

Whereas comments on unsuccessful policies were typically:

And, in many ways (a failed policy) attempted to be too broad, too far reaching by including not only industry but a whole range of infrastructure and activities that could have off-site impacts. And, by attempting to be too broad it became too general and of limited value.

It's almost so difficult to know yourself what's in (a failed policy) even if you're close to it, you can use it for everything but on the hand that can be its undoing as well. It's got to be far more precise ... So it became a monster. And it's become a monster that nobody understands what's in it.

One of the key reasons given why policies need to be clear and precise with limited scopes is to provide clarity to all the stakeholders involved in the policy making process: for example –

Well I think you have to set up the terms of reference which are particularly clear and relate to the community's perception of the issues at stake and the problems to be solved, so that the team that is gathered to consider those terms and respond to them comes back with equally clear solutions and recommendations.

Once you clearly identify the issues, then at least you can focus on what sort of prescriptions might be appropriate to address those issues. Unless you do that upfront, I find that you just start to wander all over the place and end up with a very unfocused document. Which actually leads me to make the remark that some of our documents have been a bit too unfocused and as a consequence come up with lots of recommendations, lots of actions that a whole myriad of agencies or stakeholders are responsible for implementing and they are just impossible to monitor. And because there are so many, you also find difficulty with prioritising and that sort of stuff, and eventually people just, sort of, flop and run out of steam, and the whole thing just tends to become rather unsatisfactory in terms of how it is being handled.

The arguments put in support of greater clarity can be summarised as follows: clarity makes it easier for the stakeholders and the broader community to understand the policy making

and makes it easier to identify and deal with their concerns. Limiting the scope also limits the number and type of stakeholder who needs to be involved in the process.

The other key reason given as to why policies need to be clear and precise with limited scopes is to do with implementation, so that managers and downstream decision makers have clear guidance as to how to operate and implement the policy:

But, also they were fairly clear in their objectives and policy measures, so there was a fair degree of clarity which meant that they were fairly readily capable of implementation.

Many interviewees were of the view that a clearly written policy with a limited scope was a critical factor in determining policy success.

Implementation thought through

This attribute covers the general view that a policy should not just focus on the agreed objectives but addresses the means of achieving those objectives, which means giving consideration to how the policy is to be implemented. To some extent, this relates to the policy being properly resourced and having a clear focus and scope so that downstream decision makers and managers are clear about what they need to do (the previous two attributes). Typical responses here are:

I guess any of these policies are only as good as their implementation.

You've got to have some clear mechanism of implementation. You need to create that mechanism and define that mechanism as you are going through the development of the policy. So part of the solution to the problem is in fact the process of implementing an outcome.

I think you really do (have to address implementation). It doesn't mean that you have to solve it, but you've got to be aware of what's required to give effect to this ... The bit about being aware of the implementation realities and requirements, I mean, I think is important.

As with the previous two attributes, these concerns were raised by both policy making schools, and the concerns related to whether implementation was thought about and not about which particular implementation measures are being proposed.

Policy champions

Interviewees saw a policy champion is an individual (or individuals) who continue to lobby and argue for the need to have a policy.

I think that in terms of preparation as opposed to implementation you do need someone who is prepared to push it.

It was probably to the credit of some people like (*names given*) and some of those who really understood the issue (*banning agricultural clearing*). And people in the broader conservation group of the farmers, who continued to push the issue which drove it to the position we got to.

When you get committed, passionate people in development, patient capital, intelligent capital, ethical capital, passionate consultants, designers, whatever, you can create great outcomes whatever the rules are.

The idea that policy champions are important further emphasizes the political nature of environmental policy making. It suggest that in some cases having good science and having all stakeholders supporting it may not be enough to get that final political support, and that someone needs to champion the policy at that high level. It may also be that a champion is needed to get an issue on the policy making agenda in the first place.

Appendix 6 — Final SEP for Cockburn Sound



State Environmental (Cockburn Sound) Policy 2005



Government of Western Australia
Perth, Western Australia

January 2005

Recommended reference

The recommended reference for this publication is: Government of Western Australia (2005), *State Environmental (Cockburn Sound) Policy 2005*, Western Australia, State Environmental Policy Series 01, 30p.

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Foreword



I am pleased to release Western Australia's first State Environment Policy and delighted that this first policy is for the protection of the environmental quality of Cockburn Sound.

The Policy will be implemented through existing statutory powers under the *Environmental Protection Act 1986*.

It takes a precautionary approach to environmental management, where early warning levels will help trigger preventative action rather than wait for environmental incidents to occur.

This Policy will be backed by the full force of recently expanded powers under the *Environmental Protection Act 1986*, including environmental harm, clearing controls, licensing and unauthorised discharge regulations to prevent environmental impacts that might threaten the long-term ecological sustainability of the Sound.

For example, for premises licensed under the *Environmental Protection Act 1986*, licence conditions will ensure that the environmental values are protected and environmental quality objectives are being met.

For diffuse sources of emissions which find their way to the waters of Cockburn Sound, the Cockburn Sound Management Council plays a role in ensuring that land use practices within the catchment of Cockburn Sound are addressed.

As well, this Policy empowers the Cockburn Sound Management Council to report annually to the Minister on the 'State of the Sound' and for the Minister to table that report in the Parliament.

The State Environmental Policy raises the Government's level of commitment to the protection of water quality in Cockburn Sound, supported by the expanded powers of the Environmental Protection Act.

This Policy will be reviewed in seven years unless reviewed earlier by Government.

Judy Edwards

Dr Judy Edwards MLA
Minister for the Environment
January 2005

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Draft State Environmental (Cockburn Sound) Policy

1. Preamble

The Government of Western Australia –

- (a) *recognises that Cockburn Sound, situated within Perth's coastal waters, is highly valued by the community for its ecological, economic and recreational attributes;*
- (b) *is conscious of the need to protect the intrinsic value of biological diversity and the ecological, genetic, social, economic, scientific, educational, cultural, recreational, aesthetic, and natural values of biological diversity and its components;*
- (c) *recognises the importance of not unnecessarily restricting public access to the foreshore and waters of Cockburn Sound;*
- (d) *recognises the importance of Cockburn Sound for activities such as fisheries, aquaculture and tourism which require a high level of marine water quality and for uses such as industry, shipping, harbours and marinas (even though they can lower environmental quality in localised areas), provided that all reasonable and practicable measures are taken to prevent or minimise waste discharge and contamination;*
- (e) *recognises the Intergovernmental Agreement on the Environment made between the Commonwealth, the States and Territories, and the Australian Local Government Association on 1 May 1992; in particular the four principles of ecologically sustainable development pertaining to management of ecosystems, biodiversity, intergenerational equity, and the precautionary principle;*
- (f) *recognises that all the uses of Cockburn Sound and its catchment, as they affect the Cockburn Sound, need to be managed in accordance with the above-mentioned principles of ecologically sustainable development;*
- (g) *recognises the policy's linkages with other Commonwealth and State legislation, policies, strategies and action plans concerning Cleaner Production, Best Practice and Waste Minimisation, Continual Improvement and sustainability;*
- (h) *recognises that the policy strives for best environmental quality throughout Cockburn Sound;*
- (i) *recognises that events and activities outside the policy area may adversely affect the environmental values established in the policy from time to time; and*
- (j) *recognises the importance of Cockburn Sound and Naval Waters to the Australian Defence Force and acknowledges the Commonwealth environmental, legislative and policy framework by which it abides.*

2. Citation

This policy may be cited as the *State Environmental (Cockburn Sound) Policy 2005*.

3. Purpose of policy

- (1) This policy establishes the basis on which Cockburn Sound and the environment of adjacent land is to be protected.
- (2) The purposes of this policy are –
 - (a) to declare, protect and maintain the environmental values of Cockburn Sound;
 - (b) to abate pollutants and restrict activities that diminish the environmental values of Cockburn Sound;

- (c) to establish a program to protect and enhance environmental quality to support the environmental values of Cockburn Sound;
- (d) to give effect to the environmental quality objectives and the environmental quality criteria for Cockburn Sound; and
- (e) to give effect to the Environmental Management Plan for Cockburn Sound.

4. Definitions

“background level” means the level of an indicator (measured in a manner and at a location specified by the Environmental Protection Authority) in marine waters outside the influence of any discharges containing a measurable level of that indicator;

“biodiversity” means the variety and types of naturally occurring marine life. This encompasses genetic, species and ecosystem levels at the local and regional scale;

“Cockburn Sound Management Council” means the Cockburn Sound Management Council as established under clause 15 of schedule 1 of the *Water and Rivers Commission Act 1995*;

“decision scheme” specifies the way monitoring data are to be assessed against the environmental quality criteria in order to determine whether or not a management response is required;

“diffuse source” means multiple non-point sources spread over a wide area;

“environmental management plan” means the Environmental Management Plan referred to in clause 10(1)(a);

“ecological integrity” means the state of an ecosystem being whole and unimpaired, which is usually determined by reference to appropriate ecosystem indicators and criteria;

“ecological value” means the intrinsic natural values of ecosystems which require protection from the effects of pollution, environmental harm, waste discharges and deposits;

“environmental quality criteria” means the numerical values (e.g. cadmium 0.7 µg/L) or narrative statements (e.g. the 95th percentile of the bioavailable contaminant concentration in the test samples should not exceed the environmental quality guideline value) that serve as benchmarks to determine whether a more detailed assessment of environmental quality is required (these criteria are termed environmental quality guidelines), or whether a management response is required (termed environmental quality standards);

“environmental quality guideline” means a numerical value or narrative statement which if met indicates there is a high probability that the associated environmental quality objective identified in clause 7(2) has been achieved;

“environmental quality objective” means a specific management goal for a part of the environment and is either ecologically based by describing the desired level of health of the ecosystem or socially based by describing the environmental quality required to maintain specific human uses;

“environmental quality standard” means a numerical value or narrative statement beyond which the associated environmental quality objective identified in 7(2) has not been achieved and a management response is triggered;

“environmental value” means a particular value or use of the marine environment that is important for a healthy ecosystem or for public benefit, welfare, safety or health and which requires protection from the effects of pollution, environmental harm, waste discharges and deposits. Two types of environmental value are considered: ecological value and social value;

- “high level of ecological protection”** means to allow small changes in the quality of water, sediment or biota (i.e. small changes in contaminant concentrations with no resultant detectable changes beyond natural variation in the diversity of species and biological communities, ecosystem processes and abundance/biomass of marine life);
- “licensed premises”** means a residential, industrial or other premises of any kind whatsoever (including land, water and equipment), licensed by any regulating agency operating in the policy area;
- “low level of ecological protection”** means to allow for large changes in the quality of water, sediment and biota (i.e. large changes in contaminant concentrations that could cause large changes beyond natural variation in the natural diversity of species and biological communities, rates of ecosystem processes and abundance/biomass of marine life, but which do not result in bioaccumulation/biomagnification in near-by high ecological protection areas);
- “marine environment”** means marine waters and underlying sediments and the marine life therein;
- “moderate level of ecological protection”** means to allow moderate changes in the quality of water, sediment and biota (i.e. moderate changes in contaminant concentrations that could cause small changes beyond natural variation in ecosystem processes and abundance/biomass of marine life, but no detectable changes from the natural diversity of species and biological communities);
- “policy area”** means the area to which this policy applies, as shown in Schedule 1;
- “pollutant”** means any matter or thing that could have the potential to alter, directly or indirectly, the environment to the detriment of the environmental values;
- “practicable”** means reasonably practicable having regard to, among other things, local conditions and circumstances (including costs) and to the current state of technical knowledge;
- “protected area”** means the marine environment within the policy area;
- “protection”** means in relation to the environment, conservation, preservation, enhancement and management thereof;
- “public authority”** means Minister of the Crown acting in his or her official capacity, department of the Government, State agency or instrumentality, local government or other person, whether corporate or not, who or which under the authority of a written law administers or carries on for the benefit of the State, or any district or other part thereof, a social service or public utility;
- “relevant public authority”** means a public authority with responsibilities within the policy area that are relevant to the maintenance of the environmental values of Cockburn Sound, including but not limited to, those public authorities identified in the Environmental Management Plan, but not including a public authority in the capacity of operating a licensed premise;
- “social value”** means a particular value or use of the marine environment that is important for public benefit, welfare, safety or health and which requires protection from the effects of pollution, environmental harm, waste discharges and deposits; and
- “to discharge”** in relation to waste or other matter, means to deposit it or allow it to escape, or cause or permit it to be, or fail to prevent it from being, discharged, deposited or allowed to escape.

5. Application

- (1) The portion of the environment to which this policy applies is the portion of the marine environment and its land catchment that is shown in Schedule 1 as the policy area.
- (2) The area declared as a protected area under this policy is the portion of marine environment within the policy area.
- (3) This Policy will be reviewed in seven years from date of publication, unless reviewed earlier by Government.

6. Environmental values

- (1) The environmental values for the protected area under this policy are –
 - (a) Ecosystem health (an ecological value);
 - (b) Fishing and aquaculture (social values);
 - (c) Recreation and aesthetics (a social value); and
 - (d) Industrial water supply (a social value).
- (2) The environmental values require protection from the effects of pollution, environmental harm, waste discharges and deposits.
- (3) Environmental quality objectives must be achieved to protect and maintain the environmental values.

7. Environmental quality objectives

- (1) Environmental quality objectives may be defined for each environmental value identified under clause 6(1).
- (2) The environmental quality objectives identified under this policy are -
 - (a) For ecosystem health:
Maintenance of ecosystem integrity:
The level of ecological protection to be maintained for ecosystem integrity is described in terms of structure (e.g. biodiversity, biomass and abundance of biota) and function (e.g. food chains and nutrient cycles). The level of ecological protection is set out in Tables 1-3 of the *Environmental Quality Criteria Reference Document for Cockburn Sound (2003- 2004)* (Environmental Protection Authority 2005) and is set at one of the three levels, such that -
 - (i) High level of ecological protection allows small changes in the quality of water, sediments and biota;
 - (ii) Moderate level of ecological protection allows moderate changes in the quality of water, sediments and biota; and
 - (iii) Low level of ecological protection allows for a reduced level of environmental quality.

- (b) For fishing and aquaculture:
 - (i) *Maintenance of seafood for human consumption*, such that seafood is safe for human consumption when collected or grown; and
 - (ii) *Maintenance of aquaculture*, such that water is of a suitable quality for aquaculture purposes.
- (c) For recreation and aesthetics:
 - (i) *Maintenance of primary contact recreation*, such that primary contact recreation (e.g. swimming) is safe;
 - (ii) *Maintenance of secondary contact recreation*, such that secondary contact recreation (e.g. boating) is safe; and
 - (iii) *Maintenance of aesthetics*, such that the aesthetic values are protected.
- (d) For industrial water supply:

Maintenance of industrial water supply, such that water is of suitable quality for industrial water supply.
- (3) For ecosystem health –
 - (a) the boundaries between the High and Moderate ecological protection areas of the particular environmental quality objective identified in clause 7(2)(a) are shown in Schedule 2¹; and
 - (b) a map of the Low ecological protection areas as at the date of publication of this policy is shown in Schedule 3.
- (4) For ecosystem health, Low ecological protection areas –
 - (a) will be located east of the boundary between the High ecological protection area and the Moderate ecological protection area on the eastern side of Cockburn Sound; and
 - (b) will occupy a cumulative water surface area not to exceed five percent of the total water surface area east of the boundary between the High ecological protection area and the Moderate ecological protection area on the eastern side of Cockburn Sound²; and
 - (c) may be changed following review by the Environmental Protection Authority after three years or following a Government decision under the *Environmental Protection Act 1986*².
- (5) The environmental quality objectives identified in clause 7(2)(b-d) –
 - (a) apply to High and Moderate ecological protection areas as shown in Schedule 2; and
 - (b) apply to the Low ecological protection areas, except where the Environmental Protection Authority, after public consultation, determines that the pursuit of a particular objective is not reasonably compatible with discharge(s) authorised in that area(s). The extent of any variation will be published.

- (6) Activities and practices within the policy area are to be managed and reasonable and practicable measures are to be taken so that the environmental quality objectives established by this policy are achieved.

8. Environmental quality criteria

- (1) To protect the environmental values and meet the environmental quality objectives established under this policy, environmental quality criteria are established, which comprise numerical values and narrative statements.
- (2) Environmental quality criteria will be the benchmarks against which the level of achievement of the environmental quality objectives identified under clause 7 will be measured.
- (3) The focus for management is to ensure that the environmental quality objectives are achieved by meeting environmental quality guidelines. If an environmental quality guideline is not met then there is uncertainty over whether the associated environmental quality objective has been achieved and a more detailed assessment against an environmental quality standard is triggered as required under clause 9(2).
- (4) The environmental quality criteria –
 - (a) are established in the *Environmental Quality Criteria Reference Document for Cockburn Sound (2003-2004)*, Environmental Protection Authority 2005 (as amended and published from time to time by the Environmental Protection Authority following public consultation); and
 - (b) apply to the protected area through the decision schemes shown in Schedules 4 to 6. These are referred to in the table over.
- (5) The priority for management will be based on assessment of monitoring data from the protected area, such that –
 - (a) if it is determined that no environmental quality guidelines are exceeded, then the environmental quality objectives are considered to be fully met and the environmental values are considered to be protected;
 - (b) if an environmental quality guideline is exceeded, it will trigger more detailed investigations to determine whether the environmental quality standard has been met; and
 - (c) if an environmental quality standard is exceeded then the associated environmental quality objective is not met, and it will trigger an appropriate management response as required in clause 9(3).

Summary of EV, EQO, EQC and Decision Schemes for Cockburn Sound

Environmental Values	Environmental Quality Objectives and their descriptions	Environmental quality criteria	Decision scheme
Ecosystem Health (ecological value)	<p><i>Maintenance of ecosystem integrity</i> Ecosystem integrity is considered in terms of structure (e.g. the biodiversity, biomass and abundance of biota) and function (e.g. food chains and nutrient cycles). Three levels of ecological protection (High, Moderate, and Low) shall apply to different areas of Cockburn Sound.</p>	<p>Table 1 : Physical and Chemical Stressors Table 2 : Toxicants in water Table 3 : Toxicants in sediment</p> <p>Reference to Tables means those contained in the document titled <i>Environmental Quality Criteria Reference Document for Cockburn Sound (2003-2004)</i></p>	Schedule 4 in this Policy
Fishing and Aquaculture (social value)	<p><i>Maintenance of seafood safe for human consumption</i> Seafood is safe for human consumption when collected or grown in Cockburn Sound.</p> <p><i>Maintenance of aquaculture</i> Water is of a suitable quality for aquaculture purposes.</p>	<p>Table 4 : Seafood safe for human consumption Table 5 : Aquaculture</p>	Schedule 5
Recreation and Aesthetics (social value)	<p><i>Maintenance of primary contact recreation values</i> Primary contact recreation (e.g. swimming) is safe to undertake in Cockburn Sound.</p> <p><i>Maintenance of secondary contact recreation values</i> Secondary contact recreation (e.g. boating) is safe to undertake in Cockburn Sound.</p> <p><i>Maintenance of aesthetic values</i> The aesthetic values of Cockburn Sound are protected.</p>	<p>Table 6 : Primary contact recreation Table 7 : Secondary contact recreation Table 8 : Aesthetic quality</p>	Schedule 6
Industrial Water Supply (social value)	<p><i>Maintenance of industrial water supply values</i> Water in Cockburn Sound will be of a suitable quality for industrial water supply purposes.</p>	None	None

9. Application of environmental quality criteria

- (1) The relevant public authority or authorities will -
 - (a) following consultation with the Cockburn Sound Management Council, determine which parameters listed in the environmental quality criteria tables should become a focus of monitoring, further investigation and /or reporting in areas under their jurisdiction;
 - (b) notify the Cockburn Sound Management Council annually on the activities and outcomes of such monitoring programs and investigations;
 - (c) through the Cockburn Sound Management Council, cause the list of parameters and an outline of such monitoring programs to be published, as part of their annual performance report; and
 - (d) in addition to any other statutory requirements, promptly notify the Cockburn Sound Management Council where their monitoring programs or investigations identify that environmental quality guidelines or environmental quality standards have been exceeded³.

- (2) Where the Cockburn Sound Management Council becomes aware of an exceedance of an environmental quality guideline –
 - (a) the Cockburn Sound Management Council will review the information before it and assess whether in relation to the exceedance there is a relevant public authority and then -
 - (i) where it identifies that there is a relevant public authority, refer the exceedance of the environmental quality guideline to be investigated and reported by the relevant public authority against the environmental quality criteria, within a timeframe agreed with the Cockburn Sound Management Council.
 - (ii) where it identifies that there is no relevant public authority, investigate the exceedance.
 - (b) the Cockburn Sound Management Council will report to the Environmental Protection Authority the results of that investigation and any recommendations of the Cockburn Sound Management Council in relation to the maintenance of the environmental quality objectives for Cockburn Sound; and
 - (c) the Cockburn Sound Management Council will report the results of the assessment against the environmental quality criteria to the public in relation to the maintenance of the environmental quality objectives for Cockburn Sound.

- (3) Where the Cockburn Sound Management Council becomes aware of an exceedance of an environmental quality standard –
 - (a) the Cockburn Sound Management Council will report the exceedance to the Environmental Protection Authority and the Minister for the Environment as soon as practicable;
 - (b) the Cockburn Sound Management Council will review the information before it and identify whether in relation to the exceedance there is a relevant public authority and then -

- (i) where it identifies a relevant public authority, refer the exceedance to the relevant public authority to investigate and implement an appropriate management response that takes into account reasonable and practicable measures, within a timeframe agreed with the Cockburn Sound Management Council.
 - (ii) where it identifies that there is no relevant public authority, investigate the exceedance and advise the Environmental Protection Authority and the Minister for the Environment on the best means of meeting the environmental quality objectives for Cockburn Sound.
 - (c) If the exceedance of an environmental quality standard is assessed to be the result of a discharge and -
 - (i) the discharge is assessed as being from licensed premises or approved under Part IV of the *Environmental Protection Act 1986*, the management response will be implemented by the licensee or the proponent and the relevant public authority, within a timeframe agreed with those parties and the Cockburn Sound Management Council.
 - (ii) the discharge is assessed as being caused by or found to be from a diffuse source, unlicensed premise or from other activities, a management response will be coordinated through the Cockburn Sound Management Council.
 - (d) The Cockburn Sound Management Council will report to the Minister for the Environment the results of any investigations and advise on the adequacy of management responses in relation to the maintenance of environmental quality objectives for Cockburn Sound as soon as practicable; and
 - (e) The Cockburn Sound Management Council will report to the public the results of any investigations and management responses in relation to the maintenance of the environmental quality objectives for Cockburn Sound.
- (4) Where the Cockburn Sound Management Council believes that unlicensed activities have caused or contributed to the environmental quality guidelines or environmental quality standards being exceeded, and does not receive cooperation from the party or parties believed to be contributing to the exceedances in addressing the problems, then it shall make recommendations to the Minister for the Environment and any relevant public authorities as to what actions should be taken. The Cockburn Sound Management Council may publish these recommendations as provided for in clause 11.
- (5) The environmental quality guidelines and environmental quality standards established by this policy are not intended to be used to identify when pollution has occurred, but are intended as triggers for investigation and management action.
- (6) This policy recognises authorisations within the policy area existing as of the date of publication.

10. **Management program to protect**

- (1) The protection of the environmental values is to be achieved by the taking of management actions to meet the environmental quality criteria including -

- (a) implementation of an Environmental Management Plan;
 - (b) public authorities taking decisions and actions that are consistent with the environmental quality objectives referred to in clause 7; and
 - (c) the co-operation of public authorities, industry, other relevant bodies and the general public in the implementation of this policy.
- (2) The management program to protect will consist of the collective actions of public authorities responsible for elements of the framework, and will include the following components -
- (a) an Environmental Management Plan for the policy area, to be –
 - (i) prepared and coordinated by the Cockburn Sound Management Council;
 - (ii) reviewed as necessary with community consultation; and
 - (iii) endorsed by the Minister for the Environment on the advice of the Environmental Protection Authority.
 - (b) The endorsed Environmental Management Plan, which will -
 - (i) incorporate the environmental quality objectives and the environmental quality criteria referred to in clauses 7, 8 and 9;
 - (ii) identify critical areas within the policy area requiring priority protection, or priority remedial action to achieve the environmental quality objectives referred to in clause 7;
 - (iii) foster the integration of environmental planning and management for the land and marine environment within the policy area;
 - (iv) recognise and facilitate multiple use management of the protected area; and
 - (v) identify the agencies or organisations responsible for particular actions recommended under the Environmental Management Plan.
 - (c) The Cockburn Sound Management Council, which will -
 - (i) administer and coordinate the implementation of the Environmental Management Plan, and report on its performance in achieving its stated objectives;
 - (ii) promote the understanding of the Policy and the Environmental Management Plan;
 - (iii) investigate, monitor, review, report and continually improve on the achievement of environmental objectives, criteria and targets where appropriate in accordance with the Environmental Management Plan and the Policy;
 - (iv) co-ordinate, encourage or undertake research and investigations to support environmental management to meet the objectives of the Environmental Management Plan; and
 - (v) report annually to the Minister for the Environment on the implementation of the Environmental Management Plan.
 - (d) Public authorities with management responsibilities in the policy area will, within their area of jurisdiction -
 - (i) make decisions and actions consistent with the objectives of the policy;

- (ii) develop best management practices for the control of drainage, sewage, ballast water and the disposal of wastewater and the discharge of wastes and nutrients, whether point or diffuse source, and directly or indirectly discharged into the policy area;
- (iii) incorporate into their work programs means of achieving the environmental quality objectives outlined in clause 7, for activities which include but are not limited to diffuse sources of emissions and to licensed premises discharging wastes or nutrients, directly or indirectly, into the policy area;
- (iv) establish monitoring programs and inventories as appropriate, using the *Manual of Standard Operating Procedures for Environmental Monitoring against the Cockburn Sound Environmental Quality Criteria (2003-2004)*, Environmental Protection Authority 2005 (as amended and published from time to time by the Environmental Protection Authority following public consultation); and
- (v) report the results of monitoring programs to the Cockburn Sound Management Council.

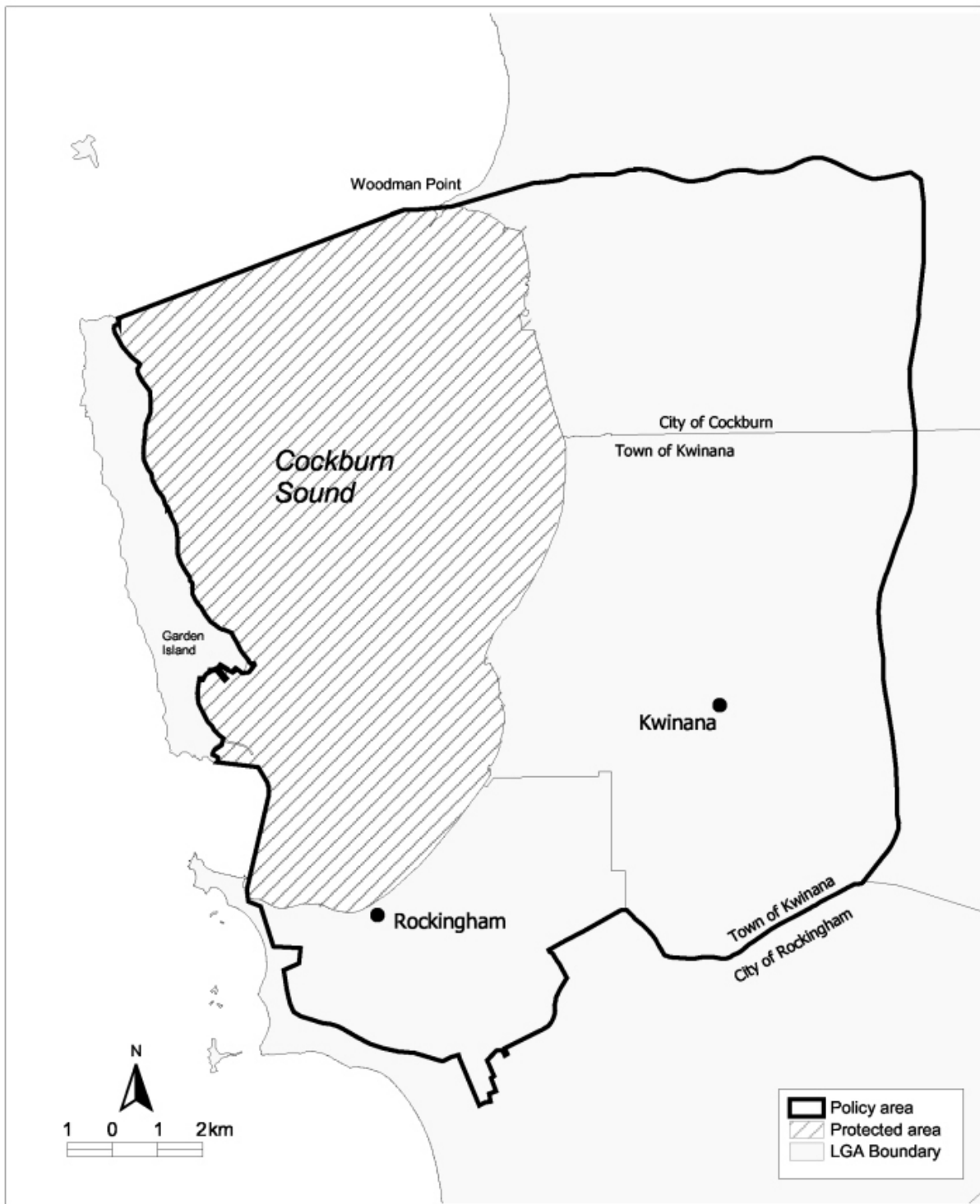
11. State of Cockburn Sound report

- (1) The Cockburn Sound Management Council will report to the Minister for the Environment on the State of Cockburn Sound each year.
- (2) The report will include annual performance and monitoring reporting as provided for in clause 9 and 10.
- (3) The Minister shall cause the report to be laid on the table of both Houses of Parliament within 10 sitting days of receiving it.

Footnotes

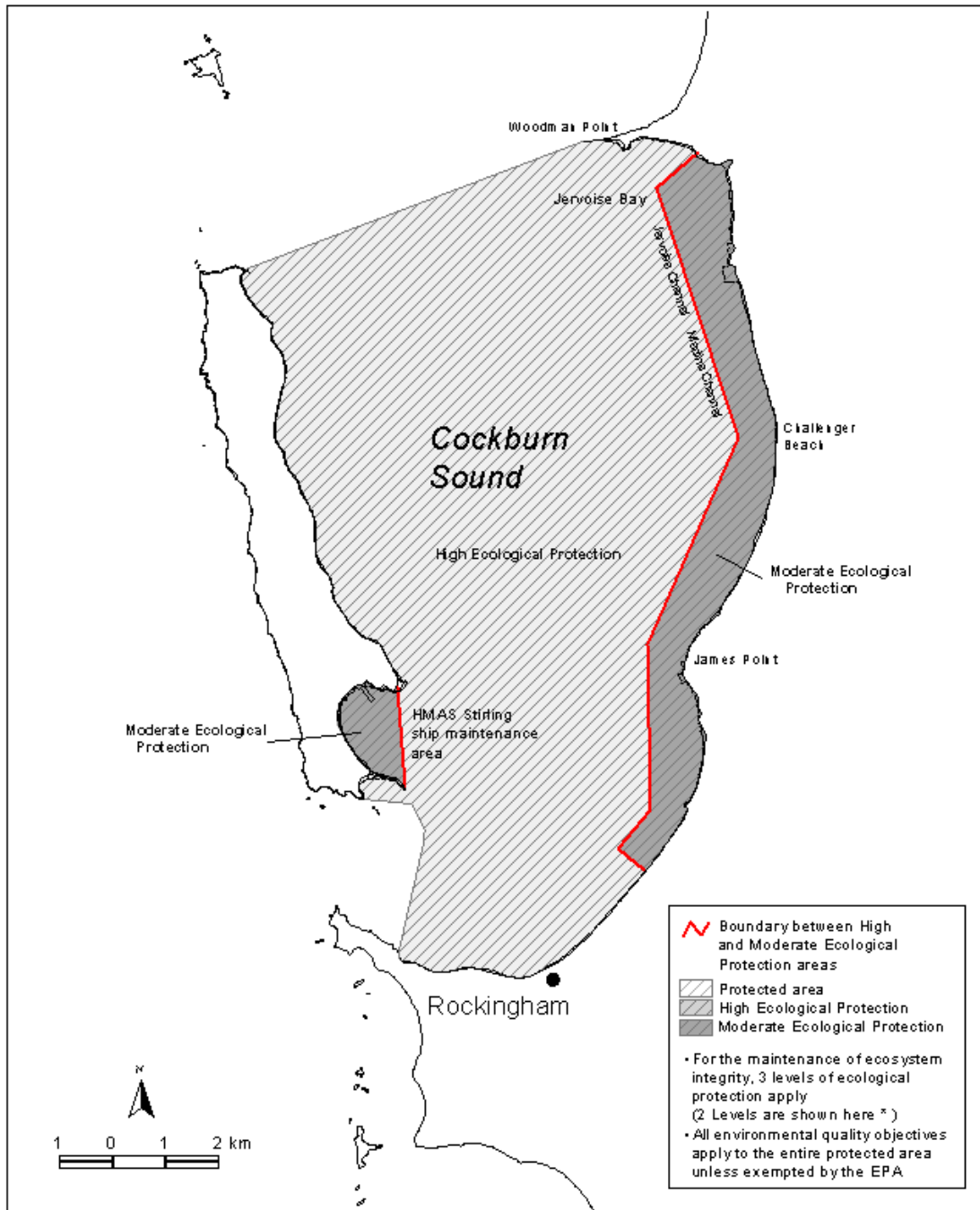
- 1 The Policy acknowledges that proposals for facilities such as ports, harbours and marinas in Cockburn Sound, if and when approved by Government under the *Environmental Protection Act 1986*, may necessitate boundary modifications including to the boundary of the protected area.
- 2 The cumulative figure of 5% will apply for the first three years of this Policy whereupon it will be reviewed by the Environmental Protection Authority in consultation with the Cockburn Sound Management Council and the public. The Environmental Protection Authority will make recommendations to the Minister for the Environment on an appropriate cumulative figure to apply for the balance of the life of the Policy. As well, changes to Low ecological protection areas are deemed “approved” if done through a Ministerial approval under the *Environmental Protection Act 1986*, and Schedule 3 will be amended accordingly.
- 3 This Policy acknowledges that the main determinants of water quality in harbours are (a) the quality of the external waters, (b) the magnitude of direct nutrient inputs, and (c) the flushing and mixing rates of the harbours (which is largely determined by harbour siting and design). If water quality in harbours is poor (due to inappropriate siting, configuration and design, or inadequate management of nutrient inputs) this is likely to adversely affect the quality of external waters beyond the confines of the harbour.
Harbour proposals should be designed and managed according to best practice, so that the environmental performance of the harbour does not measurably affect the status of a broad Moderate ecological protection area. Accordingly, the Policy is to be interpreted as follows:
 - set Moderate ecological protection areas for water quality within ports, harbours and marinas;
 - assess the water quality within ports and harbours and marinas individually, but not to use these results in assessing the status of the overall Moderate ecological protection area;
 - assess the environmental quality status of the broad Moderate ecological protection areas (outside ports and harbours and marinas).

Schedule 1



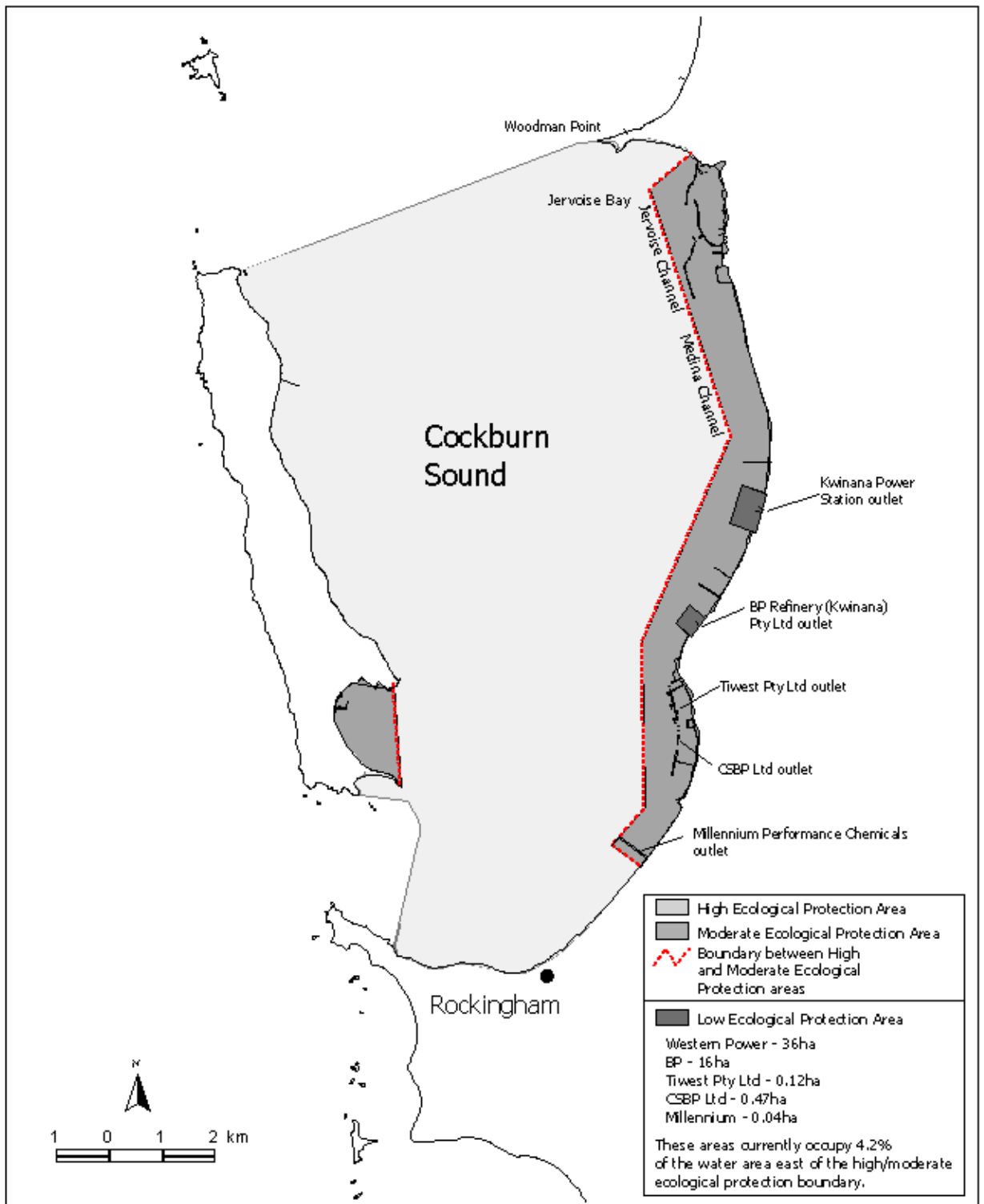
Policy Area and Protected Area

Schedule 2



The Boundaries between the High and Moderate ecological protection areas

Schedule 3



Location, size and cumulative area of Authorised Low ecological protection areas in Cockburn Sound

Note: Moderate ecological protection area criteria for toxicants may be exceeded in waters adjacent to the Low ecological protection areas up to 5% of the time, particularly under plant 'up-set conditions'.

Schedule 3 (continued)

The Low Ecological Protection Areas are the marine waters within the boundaries of the following coordinates:

(a) Location and water surface area occupied for each currently authorised LEPA

All coordinates in Map Grid of Australia Zone 50 (MGA zone50) Datum: GDA94.

Western Power Kwinana Power Station

The Low Ecological Protection Area is the marine water area within the boundaries defined by the following coordinates:

	Easting	Northing
Coordinates	384493.1	6437236.0
	384279.3	6436514.7
	383793.9	6436679.1
	384009.9	6437395.5

Water surface area 36 ha

BP Refinery (Kwinana) Pty Ltd

The Low Ecological Protection Area is the marine water area within the boundaries defined by the following coordinates:

	Easting	Northing
Coordinates	383333.2	6434876.2
	383057.4	6434521.0
	382758.6	6434775.8
	383042.9	6435125.1

Water surface area 16 ha

CSBP Limited

The Low Protection Area is the marine water area within a horizontal distance of 9 m (to the inshore direction from the diffuser) and 16 m (to the offshore direction from the diffuser), and extending 12.5 m beyond each end of the diffuser.

Water surface area 0.47 ha

Tiwest Pty Ltd

The Low Ecological Protection Area is the marine water area within the boundaries defined by the following coordinates:

	Easting	Northing
Coordinates	382779	6433136
	382779	6433060
	382795	6433060
	382795	6433136

OR

The Low Ecological Protection Area is the marine water area located within a horizontal distance of 8 m from the Tiwest effluent discharge diffuser.

Water surface area 0.12 ha

Millennium Performance Chemicals (Advance Ceramics) Pty Ltd

The Low Ecological Protection Area is the marine water area within the boundaries defined by the following coordinates:

	Easting	Northing
Coordinates	382082.0	6430412.9
	382065.9	6430425.0
	382078.0	6430440.9
	382093.9	6430429.0

Water surface area 0.04 ha

- (b) Cumulative water surface area occupied by all currently authorised LEPAs, relative to the total water surface area east of the boundary between the High Ecological Protection Area and the Moderate Ecological Protection Area on the eastern side of Cockburn Sound, expressed as a percentage.**

Cumulative water surface area of currently authorised LEPAs = 52.6 ha (*Area A*)

Total water surface area east of the boundary between the High Ecological Protection Area and the Moderate Ecological Protection Area on the eastern side of Cockburn Sound
= 1263 ha (*Area B*)

Percentage of *Area A* relative to *Area B* = 4.2 %

Schedule 4

Decision scheme	4.1:	Nutrient/physical indicators
Decision scheme	4.2:	Toxicants in water
Decision scheme	4.3:	Toxicants in sediment

Decision scheme 4.1: Narrative decision scheme for applying the Environmental Quality Criteria (EQC) for physical and chemical stressors

1. Conduct routine monitoring program covering the area to be assessed using Standard Operating Procedures. Monitoring program should be designed to allow assessment of environmental quality against Environmental Quality Guidelines (EQG) (A to G)
 - go to step 2.

2. Determine whether nutrient-related EQG (A, B or C) has been exceeded
 - [N]..... - go to step 3.
 - [Y] (EQG A or B). - go to step 7 unless
back-up samples or immediate re-sampling does not confirm exceedance of the EQG.
 - [Y] (EQG C)..... - go to step 9 unless
back-up samples or immediate re-sampling does not confirm exceedance of the EQG.

3. Determine whether dissolved oxygen-related EQG (D) has been exceeded
 - [N] - go to step 4.
 - [Y] - go to step 10 unless
immediate re-measurement does not confirm exceedance of the EQG.

4. Determine whether temperature-related EQG (E) has been exceeded
 - [N] - go to step 5.
 - [Y] - go to step 11 unless
immediate re-measurement does not confirm exceedance of the EQG.

5. Determine whether salinity-related EQG (F) has been exceeded
 - [N] - go to step 6.
 - [Y] - go to step 12 unless
immediate re-measurement does not confirm exceedance of the EQG.

6. Determine whether EQG (G) for pH has been exceeded
 - [N] - go to step 1.
 - [Y] - go to step 13 unless
immediate re-measurement does not confirm exceedance of the EQG.

The EQG is exceeded triggering more intensive investigation. Ambient quality is now monitored and assessed against the Environmental Quality Standard (EQS)

7. Expand monitoring program as appropriate and implement to allow assessment of environmental quality against EQG (A or B) and EQS (A and B)
 - go to step 8.

8. Determine whether EQS (A or B) has been exceeded
 - [N] - go to step 1.
 - [Y] - **EQS triggered** go to step 14.

9. Determine whether EQS (C) has been exceeded
 - [N] - go to step 1.
 - [Y] - **EQS triggered** go to step 14.

10. Determine whether EQS (D) has been exceeded
 - [N] - go to step 1.
 - [Y] - **EQS triggered** go to step 14.

11. Determine whether EQS (E) has been exceeded

- [N] - go to step 1.
- [Y] - **EQS triggered** go to step 14.

12. Determine whether EQS (F) has been exceeded

- [N] - go to step 1.
- [Y] - **EQS triggered** go to step 14.

13. Determine whether EQS (G) has been exceeded

- [N] - go to step 1.
- [Y] - **EQS triggered** go to step 14.

The EQS is exceeded triggering a management response.

14. Initiate management response to reduce contaminant loads and restore environmental quality to comply with the objectives within specified timeframes.

Decision scheme 4.2: Narrative decision scheme for applying the EQC for marine waters and sediment pore waters

Options are provided in the decision tree for skipping steps once an EQG has been triggered (eg. go straight to testing against biological measures, or implement agreed management strategies to reduce contaminant inputs, without undertaking all of the prior steps). This will largely be based on a simple cost/benefit analysis undertaken for each step, and would require the agreement of all key stakeholders.

1. Determine whether an EQG exists for the contaminants of concern:
[N]..... - go to step 2.
[Y]..... - go to step 4.
2. Is it appropriate to establish an EQG by determining the 80th percentile for a high ecological protection area, or 95th percentile for a moderate ecological protection area, of natural background concentration?
[N]..... - go to step 3.
[Y]..... - go to step 4.
3. Is it appropriate in the interim to assess water quality against the low reliability values (LRVs) provided in table 2c of the EQC Reference Document?
[N]..... - go to step 14 if significant threat posed by contaminant, otherwise undertake literature search and derive a suitable LRV.
[Y]..... - go to step 19.
4. Undertake routine monitoring program covering the area to be assessed and the contaminants of concern using the standard operating procedures and go to step 5.
5. Was the laboratory practical quantitation limit (PQL) for any of the contaminants above the EQG value?
[N]..... - go to step 6.
[Y]..... - if detection of the contaminant is confirmed in a backup sample go to step 10, otherwise assume the contaminant has not been detected and go to step 4.
6. Determine whether EQG (A) has been met:
[N]..... - go to step 7.
[Y]..... - go to step 9.
7. If the exceedance was for the last sampling occasion has it been confirmed (eg. analysis of back-up samples or samples collected immediately from the same sites)?
[N]..... - go to step 9.
[Y]..... - if high or moderate ecological protection area go to step 8, or if EQG derived according to step 2 go to step 10;
- if EQG for TBT was exceeded go to step 16;
- go to step 17 if the EQG was for a low ecological protection area.
8. For naturally occurring chemicals determine whether the 80th percentile for a high ecological protection area, or 95th percentile for a moderate ecological protection area, of natural background contaminant concentration exceeds the EQG:
[N]..... - go to step 10.
[Y]..... - establish the 80th or 95th percentile of background concentration as the new EQG then go to step 6.
9. For the primary contaminants determine whether EQG (B) has been met:
[N]..... - go to step 13.
[Y]..... - no toxicity problem, go to step 4.

The EQG is exceeded triggering more intensive investigation. Ambient quality is now monitored and assessed against the Environmental Quality Standard

10. Give regard to whether the level of contamination requires an urgent response by determining whether the initial management trigger (IMT) from table 2b of the EQC Reference Document has been met while investigations against the EQS are on-going:
- [N]..... - consider management action to reduce the level of contamination below the IMT; and
 - [Y]..... - go to step 11.
11. Has the contaminant of concern been identified in Table 2 of the EQC Reference Document as having the potential to adversely bioaccumulate or biomagnify?
- [N]..... - go to step 12 (steps 14 or 15 also an option), or step 14 if PQL>EQG.
 - [Y]..... - go to step 12 (steps 14 or 15 also optional), or step 14 if PQL>EQG; and
 - go to step 17.
12. Resolve bioavailable concentrations of relevant contaminants and determine whether EQS (A) has been met:
- [N]..... - go to step 14 (steps 15 or 18 also an option).
 - [Y]..... - go to step 13.
13. For the primary contaminants determine whether EQS (B) has been met:
- [N]..... - go to step 14 (steps 15 or 18 also an option).
 - [Y]..... - environmental quality acceptable, go to step 4.
14. Undertake direct toxicity assessment (DTA) using relevant species and determine whether EQS (C) and (D) have been met:
- [N]..... - go to step 15 or step 18.
 - [Y]..... - environmental quality acceptable, go to step 4.
15. Undertake detailed field investigation to determine whether EQS (E) has been met for high ecological protection areas, and EQS (E) and (G) have been met for moderate ecological protection areas:
- [N]..... - **EQS triggered.** Go to step 18.
 - [Y]..... - environmental quality acceptable, go to step 4.
16. If a guideline for TBT has been exceeded then undertake detailed field investigation to determine whether EQS (F) has been met:
- [N]..... - **EQS triggered.** Go to step 18.
 - [Y]..... - environmental quality acceptable, go to step 4.
17. Determine whether EQS (G) for high protection has been met in adjacent high ecological protection areas:
- [N]..... - **EQS triggered.** Go to step 18.
 - [Y]..... - chemical not bioaccumulating, go to step 4.
18. Implement management action to reduce contaminant inputs to the ambient environment and achieve the environmental quality objective within an agreed timeframe. Prior to implementing management action procedures such as Toxicity identification evaluation (TIE) and Contaminant body residue (CBR) might be required to confirm the specific cause of toxicity or the source of contaminants. In extreme circumstances environmental remediation may be considered appropriate. If EQC for the maintenance of safe seafood have been listed in Table 4 for the problem contaminant(s) then consideration should be given to monitoring the contaminant in seafood to assess risk to human health.
19. Include contaminant in routine monitoring program. If the LRV is not exceeded then environmental quality is acceptable and no management action is required. If the LRV is exceeded, consult with relevant regulators to ensure unacceptable impacts are avoided (this may include undertaking a literature search on effects of the contaminant, undertaking direct toxicity assessment or upgrading the LRV into an EQG).

Decision scheme 4.3: Narrative decision scheme for applying the EQG for toxicants in sediments

Options are provided in the decision tree for skipping steps once an EQG has been triggered (eg. go straight to testing against biological measures, or implement agreed management strategies to reduce contaminant inputs, without undertaking all of the prior steps). This will largely be based on a simple cost/benefit analysis undertaken for each step, and would require the agreement of all key stakeholders.

1. Determine whether an EQG value exists for the contaminants of concern:
[N]..... - go to step 2.
[Y]..... - go to step 3.
2. Is it appropriate to establish an EQG value based on natural background concentration?
[N]..... - go to step 13.
[Y]..... - establish the 90th percentile of background concentration as the EQG value then go to step 3.
3. Undertake routine monitoring program covering the area to be assessed using the standard operating procedures and go to step 4.
4. Determine whether EQG (A) has been met:
[N]..... - go to step 5.
[Y]..... - go to step 8.
5. If the exceedance was for the last sampling occasion has it been confirmed (eg. analysis of back-up samples or samples collected immediately from the same sites)?
[N]..... - go to step 8.
[Y]..... - go to step 6.
6. Was the exceeded EQG established for a low ecological protection area?
[N]..... - if EQG for TBT was exceeded go to step 16; and
- go to step 7 (optional); or
- go to step 8 to define any 'hot spots'; and
- to step 10 to assess the entire sampled area against the EQS.
[Y]..... - go to step 16.
7. For naturally occurring chemicals determine whether the natural background contaminant concentration exceeds the EQG value (unlikely in most cases, note that test site and reference site must have comparable grain sizes):
[N]..... - go to step 8 to define any 'hot spots'; and
- to step 10 to assess the entire sampled area against the EQS.
[Y]..... - establish the 90th percentile of background concentration as the new EQG value then go to step 4.
8. Assess whether EQG (B) has been met:
[N]..... - go to step 9.
[Y]..... - no toxicity problem, go to step 3.
9. Determine whether the extent of potential contamination needs to be characterised further (in most cases this will be necessary):
[N]..... - no toxicity problem, go to step 3.
[Y]..... - determine area of potential contamination, if sufficient data for its assessment go to step 4; or
- determine area of potential contamination, design sampling program for this area and go to step 3.

The EQG is exceeded triggering more intensive investigation. Ambient quality is now monitored and assessed against the Environmental Quality Standard

10. Has the contaminant of concern been identified in Table 3 of the EQC Reference Document as having the potential to adversely bioaccumulate or biomagnify:
- [N]..... - go to step 11 (steps 12, 13 or 14 also an option).
[Y]..... - go to step 11 (step 12, 13 or 14 also optional);
and
- go to step 16.
11. Resolve bioavailable concentrations (as far as possible) for relevant contaminants and determine whether EQS (A) and (B) have been met:
- [N]..... - go to step 12 (steps 13, 14 or 17 also an option).
[Y]..... - environmental quality acceptable, go to step 3.
12. Sample and analyse sediment porewaters for those contaminants of concern that have an EQG for water (Table 2a or EQC Reference document) and determine whether EQS (C) has been met:
- [N]..... - go to step 13 (steps 14 or 17 also an option).
[Y]..... - environmental quality acceptable, go to step 3.
13. Undertake sediment toxicity testing using relevant species and determine whether EQS (D) has been met:
- [N]..... - go to step 14 or step 17.
[Y]..... - environmental quality acceptable, go to step 3.
14. Undertake detailed field investigation to determine whether EQS (E) has been met for high ecological protection areas, or EQS (E) and (G) have been met for moderate ecological protection areas:
- [N]..... - **EQS triggered.** Go to step 17.
[Y]..... - environmental quality acceptable, go to step 3.
15. If a guideline for TBT has been exceeded then undertake detailed field investigation to determine whether EQS (F) has been met:
- [N]..... - **EQS triggered.** Go to step 17.
[Y]..... - environmental quality acceptable, go to step 3.
16. Determine whether EQS (G) for high protection has been met in adjacent high ecological protection areas:
- [N]..... - **EQS triggered.** Go to step 17.
[Y]..... - chemical not bioaccumulating, go to step 3.
17. Implement management action to reduce contaminant inputs to the ambient environment and achieve the environmental quality objective within an agreed timeframe. Prior to implementing management action procedures such as TIE and CBR might be required to confirm the specific cause of toxicity or the source of contaminants. In extreme circumstances environmental remediation may be considered appropriate. If EQC for the maintenance of safe seafood have been listed in Table 4 for the problem contaminant(s) then consideration should be given to monitoring the contaminant in seafood to assess risk to human health.

Schedule 5

Decision scheme 5.1: Seafood safe for human consumption

Decision scheme 5.2: Aquaculture

Decision scheme 5.1: Narrative decision scheme for applying the EQC for seafood safe for human consumption

- 1. Conduct routine monitoring program covering the area to be assessed and the contaminants of concern using the standard operating procedures and go to step 2.
- 2. Determine whether EQG (A, B and/or C) have been met, and whether EQS (D, E or F) have been met:
 - [N]..... - go to step 3.
 - [Y]..... - seafood suitable for consumption, go to step 1.
- 3. Are any of the exceedances confirmed by analysing the back-up samples or samples collected immediately from the same sites?
 - [N]..... - seafood suitable for consumption, go to step 1.
 - [Y]..... - go to step 4 if EQG A not met; and
 - go to step 6 if EQG B not met; and
 - go to step 7 if EQG C not met; and
 - go to step 8 if EQS (D, E or F) not met.

The EQG is exceeded triggering more intensive investigation. Ambient quality is now monitored and assessed against the Environmental Quality Standard

- 4. Determine whether EQS (A) has been met:
 - [N]..... - go to step 5 (or proceed directly to step 8).
 - [Y]..... - go to step 7 for advice on conducting sanitary survey; and
 - go to step 1.
- 5. Determine whether EQS (B) has been met:
 - [N]..... - **EQS triggered.** Go to step 8.
 - [Y]..... - go to step 7 for advice on further monitoring of seafood and conducting sanitary survey; and
 - go to step 1.
- 6. Determine whether EQS (C) has been met:
 - [N]..... - **EQS triggered.** Go to step 9.
 - [Y]..... - EQS not triggered, go to step 7; and
 - go to step 1.
- 7. Contact the Health Department of WA with the results and seek advice on any additional monitoring or management requirements to ensure human health risks are managed at an appropriate level.
- 8. Implement management action to reduce contaminant inputs, or if this is not practically feasible, then reduce risk to public health through implementation of appropriate management on advice of the Health Department of WA. If appropriate, environmental remediation may be required.
- 9. Implement management action to reduce the risk to public health on advice of the Health Department of WA. Determine the cause of the toxic algal bloom and, if appropriate, reduce contaminant inputs.

Decision scheme 5.2: Narrative decision scheme for applying the EQC for aquaculture production

Options are provided in the decision tree for skipping steps once an EQG has been triggered (eg. go straight to testing against biological measures, or implement agreed management strategies to reduce contaminant inputs, without undertaking all of the prior steps). This will largely be based on a simple cost/benefit analysis undertaken for each step, and would require the agreement of all key stakeholders.

1. Conduct routine monitoring program covering the area to be assessed and the contaminants of concern using the standard operating procedures and go to step 2.
2. Determine whether EQG (A and/or B) have been met:
[N]..... - go to step 3
[Y]..... - suitable for aquaculture, go to step 1.
3. If the exceedance was for the last sampling occasion has analysis of back-up samples, or samples collected immediately from the same sites, confirmed the exceedance?
[N]..... - suitable for aquaculture, go to step 1.
[Y]..... - go to step 4 if the indicator is naturally occurring; and
- go to step 8 if the indicator is a xenobiotic chemical.
4. Determine whether the 95th percentile of natural background contaminant concentration exceeds the EQG:
[N]..... - go to step 6 if EQG A was not met; and
- go to step 8 if EQG B was not met.
[Y]..... - go to step 5.
5. Establish the 95th percentile of background concentration as the new EQG then determine whether EQG (A and/or B) have been met:
[N]..... - go to step 6 if EQG A not met; and
- go to step 8 if EQG B not met.
[Y]..... - suitable for aquaculture, go to step 1.

The EQG is exceeded triggering more intensive investigation. Ambient quality is now monitored and assessed against the Environmental Quality Standard

6. Determine whether EQS (A) has been met:
[N]..... - go to step 7 (step 11 is also optional).
[Y]..... - EQS not triggered, go to step 1.
7. Determine whether EQS (B) has been met:
[N]..... - **EQS triggered**, go to step 11.
[Y]..... - EQS not triggered, go to step 1.
8. Determine whether EQS (C) has been met:
[N]..... - go to step 9 (steps 10 or 11 also optional).
[Y]..... - EQS not triggered, go to step 1
9. Determine whether EQS (D) has been met:
[N]..... - go to step 10 (step 11 also optional).
[Y]..... - EQS not triggered, go to step 1.
10. Determine whether EQS (E or F) have been met:
[N]..... - **EQS triggered**, go to step 11.
[Y]..... - EQS not triggered, go to step 1.
11. Implement management action to reduce contaminant inputs to the ambient environment and achieve the environmental quality objective within an agreed timeframe. Prior to implementing management action procedures such as TIE and CBR might be required to confirm the specific cause of toxicity or the source of contaminants. In extreme circumstances environmental remediation may be considered appropriate.

Schedule 6

Decision scheme 6.1: Primary contact recreation

Decision scheme 6.2: Secondary contact recreation

Decision scheme 6.3: Aesthetic quality

Decision scheme 6.1: Narrative decision scheme for applying the EQC for primary contact recreation

1. Conduct routine monitoring program covering the area to be assessed and the contaminants of concern using the standard operating procedures and go to step 2.
2. Determine whether EQG (A, B, C and/or D) have been met, and whether EQS (C or D) have been met:
[N]..... - go to step 3 if EQG B or D or EQS C exceeded.
 - go to step 4 if EQG A not met, and
 - go to step 7 if EQG C not met, and
 - go to step 8 if EQS D not met.
[Y]..... - suitable for recreation, go to step 1.
3. If the exceedance was for the last sampling occasion has it been confirmed (eg. through the analysis of back-up samples or samples collected immediately from the same sites)?
[N]..... - suitable for recreation, go to step 1.
[Y]..... - go to step 6 if EQG B not met, and
 - go to step 8 if EQG D not met, and
 - go to step 9 if EQS C not met.

The EQG is exceeded triggering more intensive investigation. Ambient quality is now monitored and assessed against the Environmental Quality Standard

4. Determine whether EQS (A) has been met:
[N]..... - go to step 5 and,
 - go to step 9.
[Y]..... - go to step 5.
5. Undertake a sanitary inspection of the site in liaison with the Health Department of WA to further assess the risk to recreational users. Develop predictive approaches to give early warning of periods or events likely to result in poor microbiological water quality and increase sampling frequency in these areas then:
 - go back to step 1.
6. Contact the Health Department of WA and intensify monitoring of potentially toxic algal species to assess human health risk and determine whether EQS (B) has been met:
[N]..... - go to step 9.
[Y]..... - No issue identified, go to step 1.
7. Swimmers should be urged to use caution when swimming in these waters. Signage may be an option.
8. Contact the Health Department of WA with the results and seek advice on setting an appropriate environmental quality standard that protects recreational users and on any additional monitoring or management requirements to ensure human health risks are managed at an appropriate level.
9. Reduce risk to public health through appropriate management on advice of the Health Department of WA and implement management action to reduce contaminant inputs where these have been shown to have caused the problem. If appropriate, environmental remediation may be required.

Decision scheme 6.2: Narrative decisions scheme for applying the EQC for secondary contact recreation

- 1. Conduct routine monitoring program covering the area to be assessed and the contaminants of concern using the standard operating procedures and go to step 2.
- 2. Determine whether EQG (A, B and/or C) have been met, and whether EQS (C) has been met:
 - [N]..... - go to step 3 if EQG B or EQS C not met, and
 - go to step 4 if EQG A not met, and
 - go to step 7 if EQG C not met.
 - [Y]..... - suitable for secondary contact recreation, go to step 1.
- 3. If the exceedance was for the last sampling occasion has it been confirmed (eg. through the analysis of back-up samples or samples collected immediately from the same sites)?
 - [N]..... - suitable for recreation, go to step 1.
 - [Y]..... - go to step 6 if EQG B not met, and
 - go to step 8 if EQS C not met.

The EQG is exceeded triggering more intensive investigation. Ambient quality is now monitored and assessed against the Environmental Quality Standard

- 4. Determine whether EQS (A) has been met:
 - [N]..... - go to step 5, and
 - go to step 8.
 - [Y]..... - go to step 5.
- 5. Undertake a sanitary inspection of the site in liaison with the Health Department of WA to further assess the risk to recreational users. Develop predictive approaches to give early warning of periods or events likely to result in poor microbiological water quality and increase sampling frequency in these areas then:
 - go back to step 1.
- 6. Determine whether EQS (B) has been met:
 - [N]..... - go to step 8;
 - [Y]..... - no issue identified, go to step 1.
- 7. Contact the Health Department of WA with the results and seek advice on setting an appropriate environmental quality standard that protects recreational users and on any additional monitoring or management requirements to ensure human health risks are managed at an appropriate level.
- 8. Reduce risk to public health through appropriate management on advice of the Health Department of WA and implement management action to reduce contaminant inputs where these have been shown to have caused the problem. If appropriate, environmental remediation may be required.

Decision scheme 6.3: Narrative decision scheme for applying the EQC for aesthetic quality

1. Conduct routine monitoring program covering the area to be assessed and monitor public complaints. Go to steps 2 and 3.
2. Determine whether all of EQG (A to I) have been met:
 [N]..... - go to step 5.
 [Y]..... - aesthetic values not compromised, go to step 1.
3. Determine whether EQG (J) has been met:
 [N]..... - go to step 4
 [Y]..... - aesthetic values not compromised, go to step 1.
4. If the exceedance was for the last sampling occasion has it been confirmed through analysis of back-up samples or samples collected immediately from the same sites?
 [N]..... - aesthetic values not compromised, go to step 1.
 [Y]..... - go to step 6.

The EQG has been triggered and the EQS need to be addressed.

5. Determine whether EQS (A) has been met:
 [N]..... - go to step 7;
 [Y]..... - aesthetic values not compromised, go to step 1.
6. Determine whether EQS (B) has been met:
 [N]..... - go to step 7;
 [Y]..... - aesthetic values not compromised, go to step 1.
7. Identify the causes for the loss of aesthetic value in Cockburn Sound and implement management actions to prevent further reduction of, and if possible to improve, the aesthetic value within an agreed timeframe.