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FISH STOCK AND FISHERY ENHANCEMENT IN WESTERN AUSTRALIA

*Summary of
Fisheries Management Paper No. 175*

FISHERIES MANAGEMENT PAPER NO. 176

Department of Fisheries
168 St. Georges Terrace
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Fish Stock and Fishery Enhancement
in Western Australia

Summary of
Fisheries Management Paper No. 175

By Jane Borg

March 2004

Fisheries Management Paper No. 176
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Errata

Please note the public comment period for Fisheries Management Paper No. 175 *Fish Stock and Fishery Enhancement in Western Australia* and its companion document, Fisheries Management Paper 176 *Fish Stock and Fishery Enhancement in Western Australia (Summary of Fisheries Management Paper No. 175)*, has been adjusted.

The Department of Fisheries advises that the public comment period for both documents is open until 31 May 2004.

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OPPORTUNITY FOR PUBLIC COMMENT

This summary paper provides an overview of the key proposals set out in the full policy discussion paper, Fisheries Management Paper No 175. It does not discuss the theoretical background for the framework presented and therefore readers interested in such discussion are directed to Fisheries Management Paper No 175.

Both papers have been prepared to encourage public involvement in the development of policy for stock enhancement within Western Australian waters. Stock enhancement can involve an existing fishery or creation of a new fishery through the translocation of fish. It affects both public and private waters.

Comments about this discussion paper are sought from all stakeholders, including commercial and recreational industry members, existing and potential aquaculture farmers, relevant community interest groups, government agencies and interested members of the public.

Following the publication of this paper and the public comments received, a policy paper will be developed which will outline the application and assessment processes for stock enhancement in Western Australia.

Consequently, there are some important issues you may wish to address in your submission:

1. Should the government legislate for the management of all stock enhancement?
2. In assessing the movement of any aquatic species, the economic and social benefits must be balanced with biological and environmental risks, although the latter are paramount.
3. What level of risk would be considered acceptable?
4. Adequate research and monitoring requires funding, which is not always available within the timeframes required for decision-making.
5. With whom should final accountability for a particular stock enhancement project lie?
6. Are the proposed guidelines appropriate?

Although we have identified specific issues of interest, we seek your views on any or all of the matters in the document of significance to you and/or your group.

To ensure your submission is as effective as possible, please:

- Make it clear and concise;
- List your points according to the topic sections and page numbers in this paper;
- Describe briefly each topic or issue you wish to discuss;
- State whether you agree or disagree with any or all of the information within each topic or just those of specific interest to you. Clearly state your reasons, particularly if you disagree, and give sources of information where possible; and
- Suggest alternatives to address any issues that you disagree with.

This paper has been prepared by the Department of Fisheries. Drafts of Fisheries Management Paper No 175 have been scrutinized by a focus group comprising a representative of the Department of Fisheries, the WA Fishing Industry Council, the Pearl Producers Association, the Aquaculture Council of WA, Recfishwest and the Conservation Council of WA. This focus group will remain involved in the development of policy arising from this consultation process.

The information provided in this paper should not be accepted to be conclusive and stakeholders are encouraged to consider additional information from other sources in providing the basis for comment.

Your comments would be appreciated by 30 April 2004 and should be marked to the attention of Senior Policy Officer, Fisheries Management Services, and addressed to:

**Executive Director
DEPARTMENT OF FISHERIES
Locked Bag 39
Cloisters Square Post Office
PERTH WA 6850**

SECTION 1 INTRODUCTION

Stock enhancement as a fisheries management tool is not a new concept, neither internationally nor within Australia. However, its popularity as ‘the answer’ to some fisheries management challenges and opportunities is on the rise in Western Australia.

Traditionally in Western Australia, fisheries have been managed by sector – commercial and recreational. Existing fisheries management arrangements recognise the State’s primary objective of sustaining WA’s fisheries. This being said, many aspects of environmental management are outside the control of the Department of Fisheries.

Commercial fisheries in Western Australia are subject to management plans, regulations or notices, which cap fishing effort and regulate the conditions under which commercial fishing may occur. For the most part, commercial fisheries are well managed and sustainable. There are, however, cases being put for fish stock enhancement in some fisheries - either to supplement a fishery that may be under some pressure from fishing (such as finfish on the West Coast) or the environment (e.g. the effect of the Leeuwin Current on scallops), or to further improve production from already sustainable fisheries.

Management of Western Australia’s recreational fishing focuses on regulation of individual activities, for example, where you may or may not fish, how much of each type of fish may be taken by an individual and the allowable size of the fish taken, and so forth. These regulations do not cap the total fishing effort on a species or in an area (unless it is closed), although there are some constraints on individual fishing effort in some fisheries.

The recreational abalone fishery would be an exception to this because the season has been reduced to a level that there is a real restriction in what could be caught. Similarly, in Freycinet Estuary in Shark Bay, tight controls have been introduced through the use of tags – each fish in possession must have a tag and the number of tags issued is limited.

Stock enhancement also offers possible remediation for non-fishery related impacts on fisheries such as ecological disruption, the pressures of development on existing fishery habitats and fishing locations, and the increasing water removal and river flow regulation.

SECTION 2 WHAT IS STOCK ENHANCEMENT?

The Department of Fisheries has adopted the international definitions for ‘ranching’. The Department refers to ranching as ‘reseeding’ and ‘stock enhancement’ (Bannister, 1991). These terms are cited and reaffirmed in Howell (1998):

Ranching: Identifiable¹ stock released with the intention of being harvested by the releasing agency.

Enhancement: Stock released for the public good without the intention of benefiting an exclusive user group.

¹ Stock released may not always be identifiable and it will not always be required in Western Australia. See Borg, 2002.

This would include:

- Compensation² for depletion of a natural resource (restocking);
- Compensation for loss of habitat (augmentation); and
- Genuine addition of new stock, for example stocking artificial reefs (addition).

This paper addresses the issues surrounding stock enhancement in Western Australia. It does not address the situation of private fisheries in closed waters, as government only regulates these fisheries where the species involved is a translocated one. Where this is the case, please refer to *Ministerial Policy Guideline No 5: The aquaculture and recreational fishing stock enhancement of non-endemic species in Western Australia* (Fisheries Department of Western Australia, 1997a).

For a discussion of reseeded, please see *Fisheries Management Paper 162: Reseeding of grazing gastropods and bivalves into the marine environment in Western Australia* (Borg, 2002).

SECTION 3 WHEN IS STOCK ENHANCEMENT APPROPRIATE?

The enhancement of fish stocks has the potential to create controversy. Although it has its place in sound fisheries resource management, stock enhancement is not the answer to all fisheries management problems. In fact, it is likely to be appropriate only in relatively few situations.

Although the technology and the enthusiasm to breed certain species in hatcheries exist, important questions need to be asked about the long-term benefits to the fishery, the ecosystem, society and the economy.

The most significant of these questions is: “What is the biological risk?” - the real risk, not just the perceived risk. Key consideration has to be conservation of fish resources and their environment, as without the resource and its environment, there is no fishery. There may be situations where there are strong, valid social or economic arguments for a stock enhancement to occur. Enhancement may be approved on these grounds alone, but not to the detriment of the sustainability of the fish and fish habitat.

Stock enhancement introduces a different dimension to fisheries management because it involves introducing something ‘new’ into a biological system, and it is likely that not all the effects of this introduction would be known. The precautionary principle states:

“Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”³

² Physical reparation.

³ Declaration from the 1992 United Nations Conference on Environment and Development, also known as Agenda 21.

This principle has been extended to most environmental situations, including fisheries management, such that caution should be taken in respect to fisheries actions that may have a serious or detrimental effect on the environment.

SECTION 4 STOCK ENHANCEMENT AS A FISHERIES MANAGEMENT TOOL

Stock enhancement must be seen as part of a total fisheries management framework. This is one management tool fisheries managers can use, noting, to be successful, any existing fisheries management problems (such as threats to the sustainability of the fish stocks or fishery) must be resolved before enhancement commences.

Furthermore, as management of WA's fisheries moves away from a sectoral model towards a system of integrated fisheries management, decisions can no longer be driven by extractive use. Decisions made under an integrated system take into account ecological, social and economic impacts. This must also be the case for stock enhancement.

The objective of this paper is to propose a process that will allow the decision makers to objectively assess the appropriateness, benefits and costs of any stock enhancement proposal under Ecologically Sustainable Development (ESD) principles.

To this end, this paper sets out a conceptual framework for assessment of stock enhancement projects, putting stock enhancement within the wider framework of fisheries and ecosystem management strategies and their assessment in Western Australia.

It does not address the actual mechanics of stock enhancement; rather, it sets out a proposed approach for the assessment of stock enhancement proposals in Western Australia.

This approach sits within the general framework of options for managing fisheries resources. It aims to test whether stock enhancement is the right response to a problem or to an opportunity, and if it is, how proposals to introduce stock enhancement should be further assessed.

SECTION 5 THE CONCEPTUAL FRAMEWORK

The conceptual framework outlined below illustrates the approach being taken in Western Australia - that stock enhancement is not a 'given'. It is one tool among many available to fishery managers.

A conceptual framework for stock enhancement is necessary because existing hatchery technology increases pressure to either enhance fisheries with a real or perceived problem, or to create new fisheries.

Firstly, before any stock enhancement proposal progresses in an existing fishery, it is necessary to analyse the problem and ask whether stock enhancement will address it. In the case of a new fishery, to assess whether the species proposed is appropriate for that

environment and whether the fishery is likely to survive (ecologically or economically) if created.

The framework is presented in four charts. The first chart asks some basic questions about the nature of the stock to be released and its place in the environment into which it is to be placed. This defines the type of fishery in question.

Charts two and three trace the steps for assessing which management option to pursue for a particular type of fishery - one for enhancement of existing fisheries, and one for creation of new fisheries, either in new waters or within waters that already support other fisheries. These two broad categories for potentially enhanced fisheries will need very different questions posed and answered.

The fourth chart picks up from the previous two at the option of 'stock enhancement' and traces the steps proposed for assessment of stock enhancement projects. Where stock enhancement is considered viable and the best option to assist in the sustainable management of a fishery or resource, a process must be followed to allow thorough assessment, monitoring, evaluation and review of each project. This process is depicted in Chart 4 and is the same for any stock enhancement project, regardless of which framework has been used.

For a full discussion of each of the steps in these charts, please refer to Fisheries Management Paper No. 175.

The steps of the conceptual framework (Charts 2, 3 and Chart 4) are proposed to ensure that stock enhancement is put in the broader perspective of fisheries management in Western Australia.

It is acknowledged that stock enhancement can be used as a positive contribution to a well-managed fishery, not just to solve problems. For example, a fishery may be meeting its current management objectives in terms of sustainability, but there may be naturally uneven distribution of stock across the fishery. If it were feasible to redistribute natural stock or to introduce hatchery stock of that species into "barren" or less productive areas, stock enhancement may improve the overall performance of the fishery.

Chart 1 Overview assessment for fish stock enhancement projects

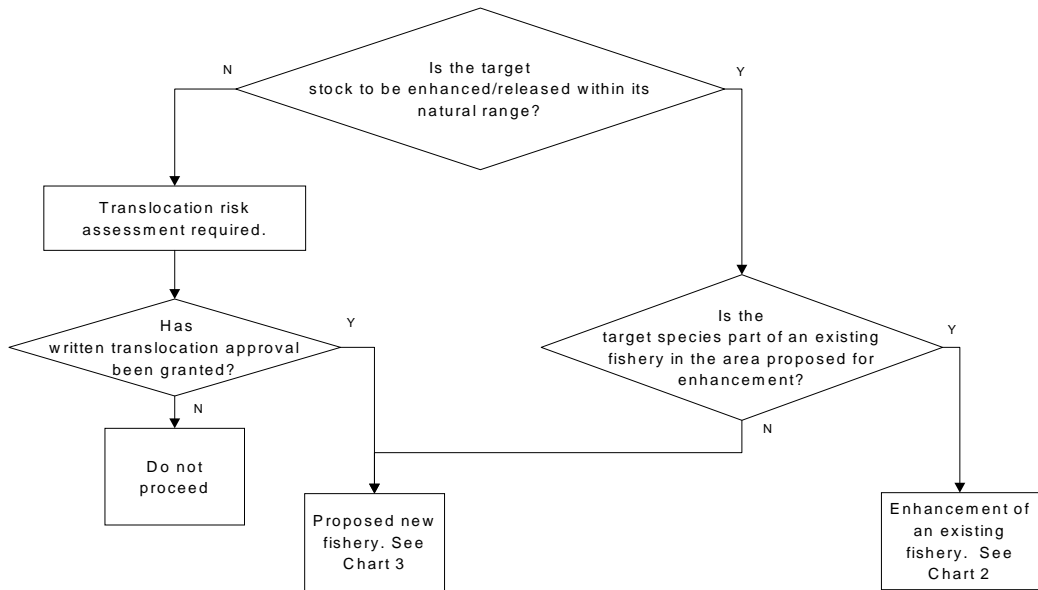


Chart 2: Assessing potential fish stock enhancement projects in existing fisheries

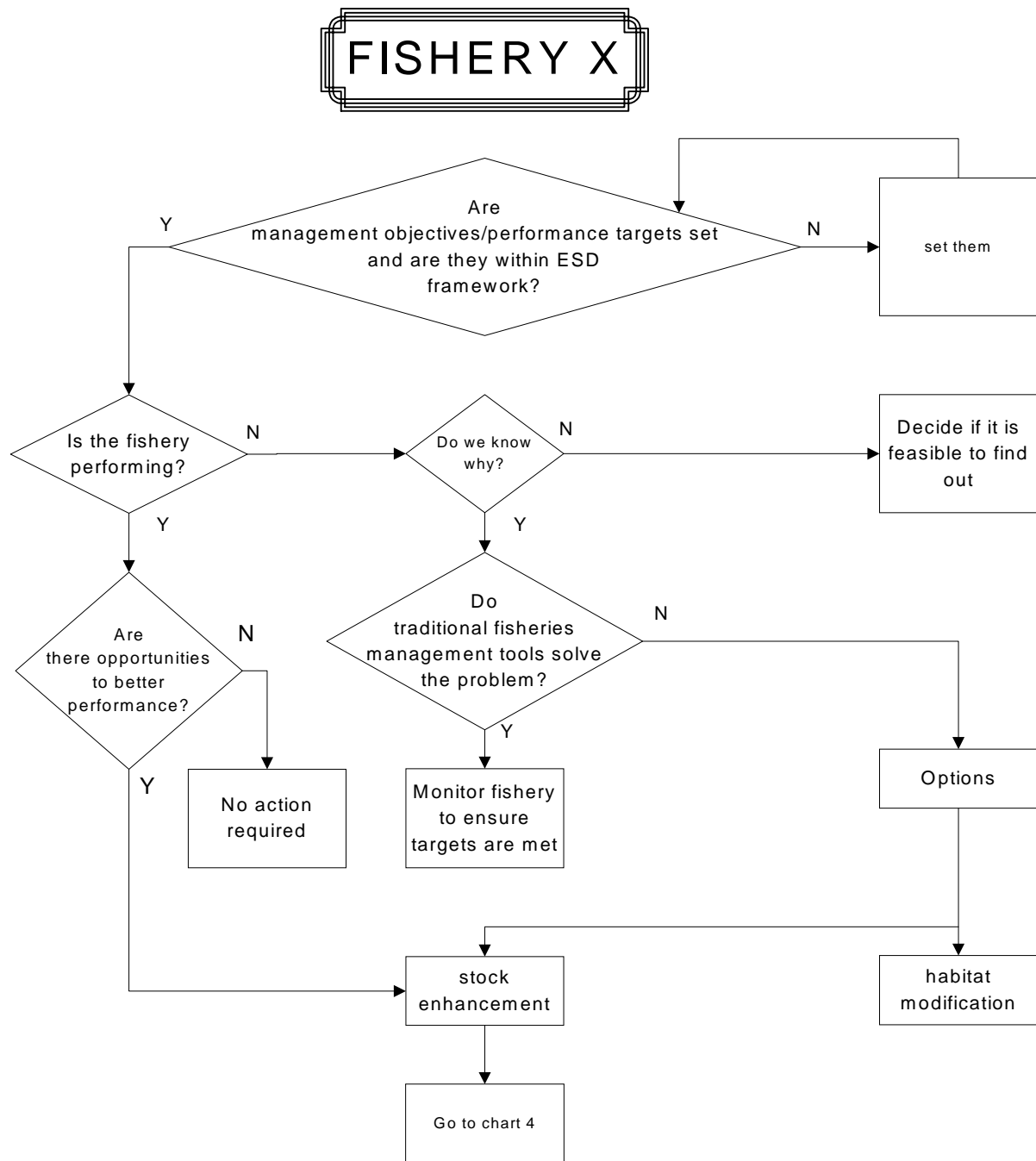


Chart 3: Assessing potential stock enhancement which creates a new fishery

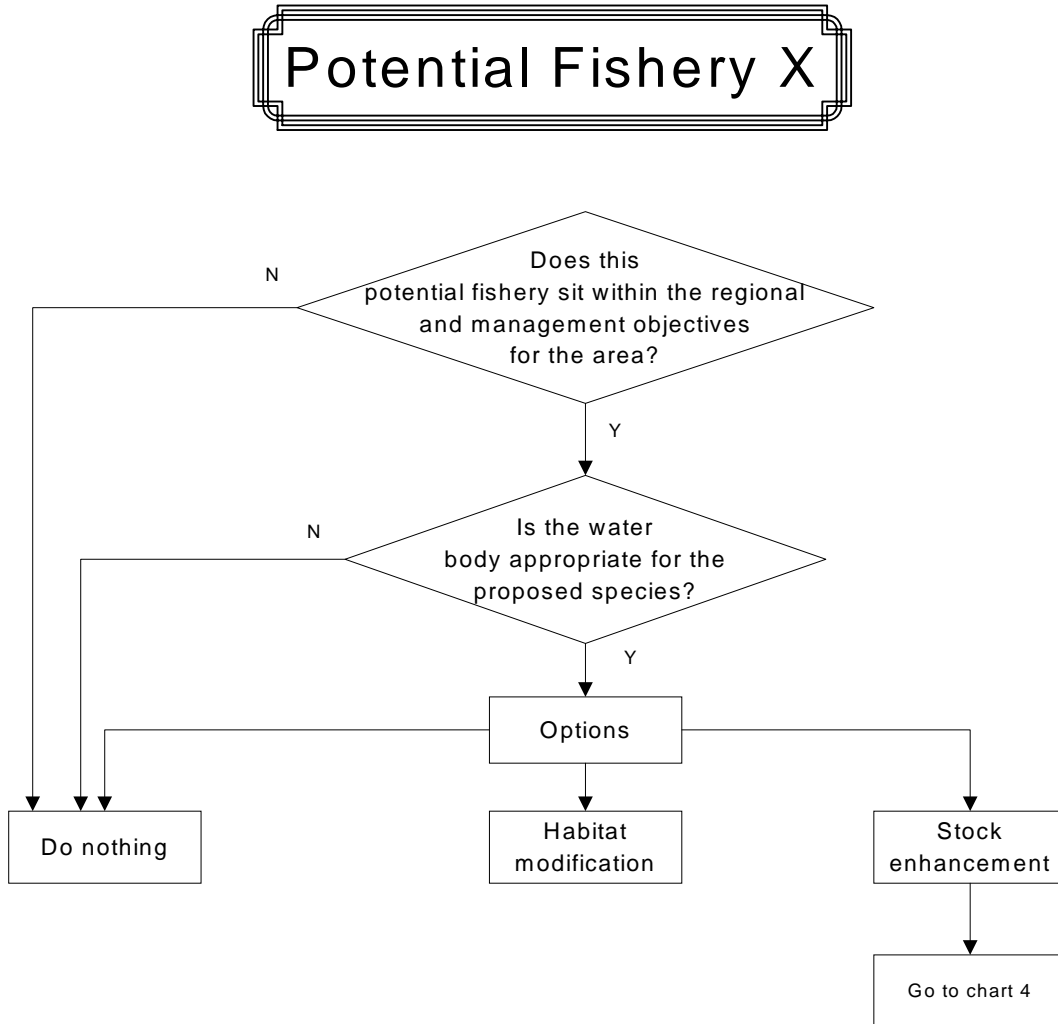
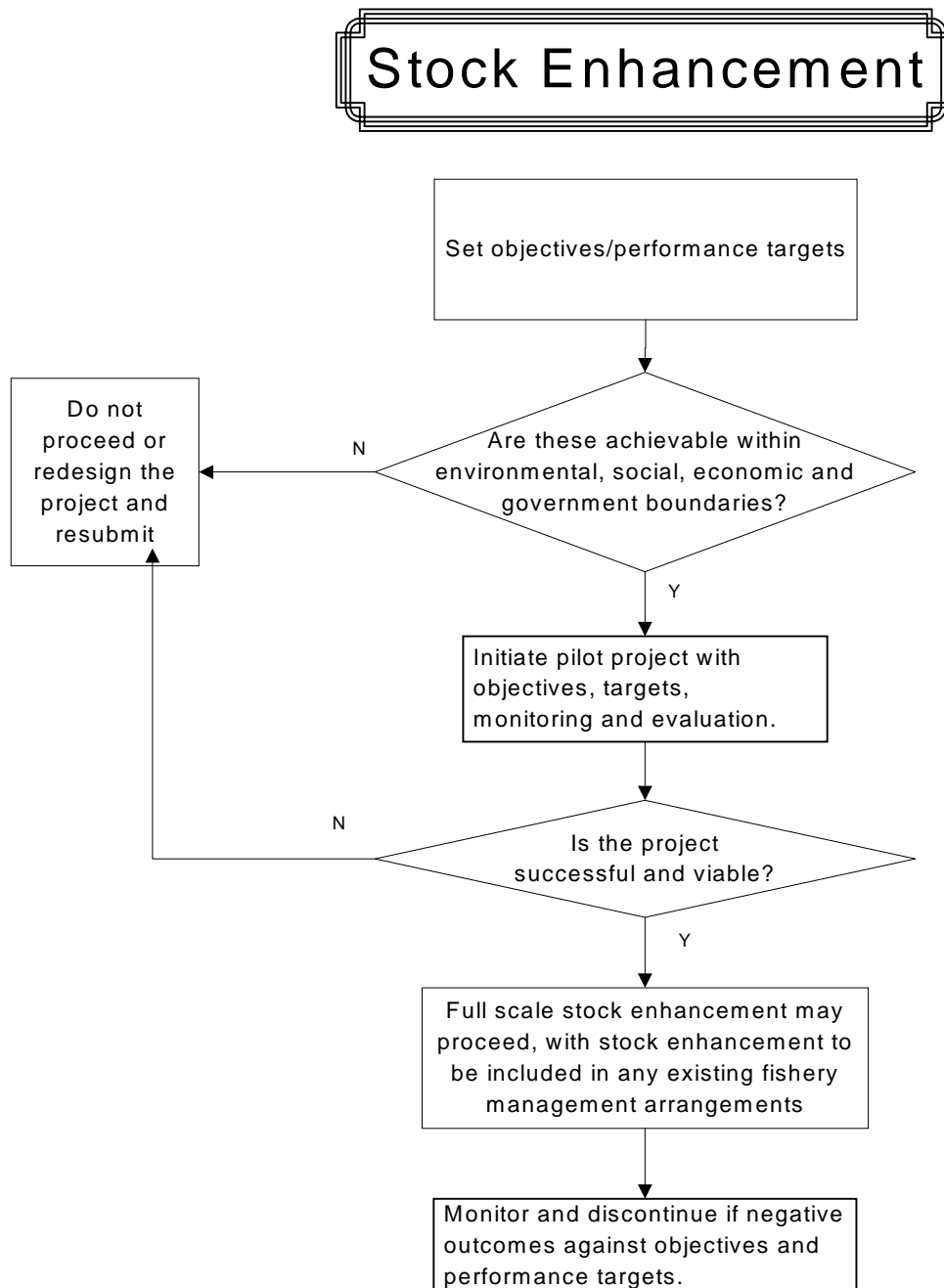


Chart 4: Decision tree for assessment of stock enhancement proposals



SECTION 6 APPLICATION PROCESS

6.1 Legislative basis for management of stock enhancement activities

Currently there is no legislative requirement to be licensed by, or seek the approval of, the Department of Fisheries to release fish into the marine or freshwater environment, unless the species to be released is not endemic to the area. If the species is not endemic, then the proponent must apply for permission to translocate the species. The process for translocation approval is set out in Ministerial Policy Guideline No 5 (Fisheries Department of Western Australia, 1997a).

The Department of Fisheries, in conjunction with the development of this policy on stock enhancement, will move to introduce powers under the *Fish Resources Management Act 1994* to allow the Department to regulate the release of fish into marine and freshwater environments for the purpose of stock enhancement. These changes will require legislative amendment and therefore is not likely within at least the next 12 months.

6.2 Assessment

Should legislation be amended to require licensing, it is envisaged applications for stock enhancement would be taken through a consultation and assessment process similar to that set out in Ministerial Policy Guideline No. 8 (Fisheries Department of Western Australia, 1997b) to ensure accountability of the proponent and full consultation with user and interest groups.

As proposed for the assessment of reseeded applications (Borg, 2002), consideration will be given to establishing a similar stakeholder committee to assist the Executive Director in the assessment of applications for stock enhancement, once legislation is in place.

SECTION 7 CONCLUSION

It is important to remember when reading this paper that it is not attempting to say fish stock enhancement will or will not be allowed in a certain circumstance, nor does this summary provide any discussion of the environmental, social and economic issues associated with stock enhancement (FMP No. 175 provides some discussion of the issues, but does not purport to be complete).

What is proposed is a possible process, including some background information to illustrate the types of considerations that will need to be taken into account when deciding whether to put forward a stock enhancement proposal. The final decision on any project would have input from a number of other departments with an interest in and legislative power over aspects of stock enhancement, such as the Department of Conservation and Land Management, the Department of Environment and the Environmental Protection Authority.

Proponents for stock enhancement projects will be required to ensure that their proposal meets these departments' requirements prior to submitting an application to the Department of Fisheries.

One of the main issues the Department of Fisheries faces in developing a policy for fish stock enhancement is this multi-departmental responsibility for resource use affecting fisheries. Land tenure, and its control by other bodies, will have a major impact on any stock enhancement management plan.

Other important issues include:

- The Department of Fisheries does not have the legislation at present to control stock enhancement unless it involves translocation. One of the proposed outcomes of this policy is legislative change to allow the Department to manage stock enhancement.
- Monitoring the success or otherwise of projects in open systems is difficult.
- Inadequate data, in many cases, has made it difficult to assess the level of impact and success of fish stock enhancement projects.

Developing a policy on fish stock enhancement is not an easy task. The issues are complex and need to be considered in context of Integrated Fisheries Management within ecologically sustainable development principles.

This paper and its proposed processes should not be seen as either the opening or closing of doors for stock enhancement. Stock enhancement should be seen as a tool for fisheries management, and that there is a need to identify and define its most effective use.

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- No. 105** Plan for the Management of the Houtman Abrolhos Fish Habitat Protection Area (draft). Prepared by the Abrolhos Islands Management Advisory Committee in conjunction with Fisheries Western Australia (October 1997)
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- No. 107** The Aquaculture of non-endemic species in Western Australia - Silver Perch (*Bidyanus bidyanus*). Tina Thorne (June 1997)
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- No. 123** Future directions for the Rock Lobster Industry Advisory Committee and the Western Rock Lobster Managed Fishery. A discussion paper prepared by Kevin Donohue on behalf of the Rock Lobster Industry Advisory Committee. (December 1998)
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- No. 140** Aquaculture Plan for the Recherche Archipelago, Western Australia. (June 2000)
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- No. 142** Fisheries Environmental Management Plan for the Gascoyne Region (June 2002)
- No. 143** Western Rock Lobster. Discussion paper for seasons 2001/2002 and 2002/2003 (July 2000)
- No. 144** The Translocation of Brown Trout (*Salmo trutta*) and Rainbow Trout (*Oncorhynchus mykiss*) into and within Western Australia. Prepared by Jaqueline Chappell, contributions from Simon Hambleton, Dr Howard Gill, Dr David Morgan and Dr Noel Morrissy. (*not published, superseded by MP 156*)
- No. 145** The Aquaculture of non-endemic species in Western Australia - Silver Perch (*Bidyanus bidyanus*). As amended October 2000. Tina Thorne. This replaces Fisheries Management Paper No. 107.
- No. 146** Sustainable Tourism Plan for the Houtman Abrolhos Islands (February 2001)
- No. 147** Draft Bycatch Action Plan for the Shark Bay Prawn Managed Fishery (Full Report) (April 2002)
- No. 148** Draft Bycatch Action Plan for the Shark Bay Prawn Managed Fishery (Summary Report) (April 2002)
- No. 149** Final Plan of Management for the Lancelin Island Lagoon Fish Habitat Protection Area (March 2001)
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- No. 151** Inventory of the Land Conservation Values of the Houtman Abrolhos Islands (July 2003)
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- No. 153** A Five-Year Management Strategy for Recreational Fishing on the West Coast of Western Australia. Final Report of the West Coast Recreational Fishing Working Group (August 2001).
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- No. 157** Policy for the Implementation of Ecologically Sustainable Development for Fisheries and Aquaculture within Western Australia. By W.J. Fletcher (May 2002)
- No. 158** Draft Plan of Management for the Miaboolya Beach Fish Habitat Protection Area (March 2002)

- No. 159** The Translocation of Barramundi (*Lates calcarifer*) for Aquaculture and Recreational Fishery Enhancement in Western Australia. By Tina Thorne.
- No. 160** The Introduction and Aquaculture of Non-endemic Species in Western Australia: the 'Rotund' Yabby *Cherax rotundus* and the All-male Hybrid Yabby. A Discussion Paper. (June 2002)
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- No. 163** Review of recreational take of coral in Western Australia – a discussion paper October 2002.
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- No. 165** Report to the Minister for Agriculture, Forestry and Fisheries by the Integrated Fisheries Management Review Committee (November 2002)
- No. 166** Fisheries Statutory Management Authority Inquiry. A background paper (February 2003)
- No. 167** Draft Fisheries Environmental Management Plan for the Northern Region (*in press*)
- No. 168** Aboriginal Fishing Strategy: Report to the Minister for Agriculture, Forestry and Fisheries by the Hon E. M. Franklyn QC, Chairman of the Aboriginal Fishing Strategy Working Group
- No. 169** Hardy Inlet discussion paper (*in press*)
- No. 170** Management of the proposed Geographe Bay Blue Swimmer and Sand Crab Managed Fishery. By Jane Borg and Cathy Campbell (August 2003)
- No. 171** Draft Aquaculture Plan for Shark Bay (*in press*)
- No. 172** Draft Aquaculture Plan for Exmouth Gulf (*in press*)
- No. 173** Draft Plan of Management for the proposed Point Quobba Fish Habitat Protection Area (August 2003)
- No. 174** Translocation of Golden Perch, Murray Cod and Australian Bass into and within Western Australia for the Purposes of Recreational Stocking, Domestic Stocking and Commercial and Non-commercial Aquaculture (December 2003)
- No. 175** Fish Stock and Fishery Enhancement in Western Australia - a discussion paper. By Jane Borg (March 2004)
- No. 176** Fish Stock and Fishery Enhancement in Western Australia - a summary report. By Jane Borg (March 2004)
- No. 177** Fisheries Environmental Management Plan for the Gascoyne Region (*in press*)
- No. 178** Draft Plan of Management for the Kalbarri Blue Holes Fish Habitat Protection Area (*in press*)
- No. 179** A Draft Policy for the Translocation of Brown Trout (*Salmo trutta*) and Rainbow Trout (*Oncorhynchus mykiss*) into and within Western Australia for the Purposes of Recreational Stocking, Domestic Stocking and Commercial and Non-Commercial Aquaculture (*in press*)