
Habitat Protection Plan No 3

The Hawkesbury-Nepean River System

SEPTEMBER 1998

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1. INTRODUCTION

1.1 What is a Habitat Protection Plan

The objectives of the *Fisheries Management Act 1994* (the Act), as amended in December 1997, are to conserve, develop and share the fisheries resources of New South Wales for the benefit of present and future generations, and in particular to:

- i) conserve fish stocks and protect key fish habitats;
 - ii) conserve threatened species, populations and ecological communities of fish and marine vegetation;
 - iii) promote ecologically sustainable development, including the conservation of biological diversity;
- and, consistently with these objectives, to:
- iv) promote viable commercial fishing and aquaculture industries;
 - v) promote quality recreational fishing opportunities; and
 - vi) appropriately share fisheries resources between the users of those resources.

To assist in the protection of key fish habitats, the Act enables the Minister for Fisheries to make **Habitat Protection Plans** (HPPs) for the protection of any fish habitat, “whether the habitat is critical for the survival of the species or required to maintain harvestable populations of fish”.

Under the Act, “fish” refers not only to all finfish, but also to all aquatic invertebrate animals, including molluscs, crustaceans, echinoderms and polychaete worms; other vertebrate animals, including amphibians, reptiles, birds and mammals are not included in this definition.

The Act requires the Minister to seek public comment on a Habitat Protection Plan before gazettal. **Once gazetted, the Minister and Public Authorities must have regard to any HPP that is relevant to the exercise of their functions.** A list of public authorities most likely to be affected is provided in section 5.

This HPP was developed under the Act and applies specifically to the Hawkesbury-Nepean River System and its catchment (Figure 1). Two earlier plans also apply to this river system, as well as throughout New South Wales. HPP No. 1 dealt broadly with dredging, reclamation, fish passage, mangroves, other marine vegetation and snags. HPP No. 2 dealt specifically with seagrasses.

HPP No. 3: The Hawkesbury-Nepean River System recognises the role of Total Catchment Management and Integrated Management whilst helping authorities to recognise their responsibilities in relation to fish habitat protection.

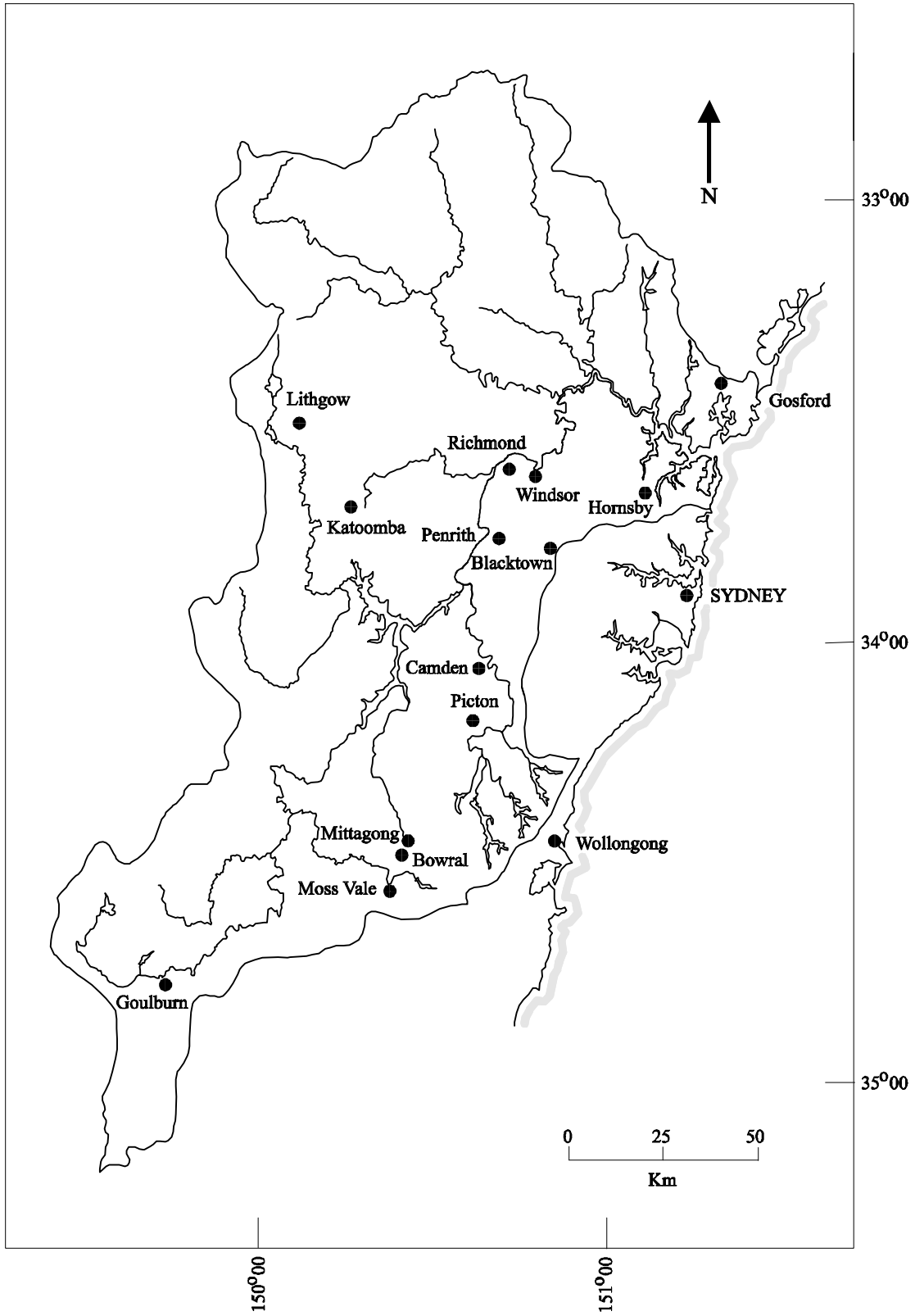


Figure 1: Map of the Hawkesbury-Nepean River System, showing the catchment boundary as well as the major tributaries and urban centres.

1.2 The need for a Habitat Protection Plan

1.2.1 Human impacts on the fish habitats of the Hawkesbury-Nepean

Years of urban and rural development have progressively degraded most of the Hawkesbury-Nepean system: water pollution, habitat alteration, river regulation, blockage of fish passage, and introductions of non-native fish and plants have all impacted on the ecosystem. In many places the river is displaying signs of severe stress, as recently illustrated by algal blooms and the proliferation of exotic macrophytes. Given the current state of the river, and continuing pressures arising from population growth and urban expansion, key fish habitats are under threat of further, possibly irreversible, damage. This HPP aims, firstly, to prevent further deterioration of these habitats, and secondly, to facilitate their rehabilitation.

1.2.2 Current habitat related legislation

A variety of legislation exists which helps to protect some key habitats in the Hawkesbury-Nepean system.

Under the *Fisheries Management Act 1994*, NSW Fisheries requires permits for dredging, reclamation and the destruction of marine vegetation (seagrass, mangroves and most types of macroalgae) in all waters of the catchment. Where a permit is required under this Act, NSW Fisheries can refuse or modify a proposed development if damage to aquatic habitats is thought likely. Compensatory transplanting of seagrass or mangroves can be specified as a permit condition. NSW Fisheries also regulates fishing and aquaculture under this Act.

The *Fisheries Management Amendment Act 1997* includes provisions based on the *Threatened Species Conservation Act 1995*, but applying to fish and marine vegetation. These provisions allow for the listing/declaration of endangered species, populations and ecological communities, along with critical habitat and key threatening processes. Recovery and threat abatement plans are also required under these provisions. However, as yet, none of the species occurring within the Hawkesbury-Nepean system are declared or listed under this legislation.

The *Marine Parks Act 1997*, administered by both NSW Fisheries and the National Parks and Wildlife Service, provides for the nomination, declaration and management of marine protected areas within NSW and is a key mechanism by which sections of the Hawkesbury estuary could be afforded extra protection in future. Such protection can also be provided under the *Fisheries Management Act 1994*, in the form of Aquatic Reserves and Intertidal Protected Areas (IPAs). An IPA currently exists around Barrenjoey Headland at the southern entrance of Broken Bay.

Under the *National Parks and Wildlife Act 1974*, the National Parks and Wildlife Service protects native aquatic macrophytes and riparian vegetation on lands under its control. Freshwater plants scheduled under the *Threatened Species Conservation Act 1995* are afforded more general protection.

The *Rivers and Foreshores Improvement Act 1948*, administered by the Department of Land and Water Conservation (DLWC), protects the stability of river channels and lakes by regulating excavation, which in this case covers dredging, and reclamation. A permit is usually required for works in the bed, or within 40 metres of the banks, unless the *Crown Lands Act 1989* applies, as is the case for most tidal

waterways. The *Native Vegetation Management Act 1997* regulates the clearing of trees and shrubs on river banks and other land mapped as “protected land”, as well as native vegetation in other areas. It also provides for the development of regional vegetation management plans and financial incentives for protection and active regeneration of native vegetation.

The *Water Act 1912* is also administered by DLWC, and provides for the licensing of water extraction and dam construction.

Under the *Protection of the Environment Operations Act 1998*, the Environment Protection Authority minimises pollution by the use of policies, prevention strategies, licensing, prosecutions and clean up strategies.

Land-use is controlled by planning instruments under the *Environmental Planning and Assessment Act 1979*, administered by the Department of Urban Affairs and Planning and local councils: broad strategies are outlined in Regional Environmental Plans (e.g. SREP No. 20 - Hawkesbury-Nepean River 1997), while more specific strategies are found in State Environmental Planning Policies (e.g. SEPP 19 - Bushland in Urban Areas) and Local Environmental Plans. The latter plans are developed by local councils. Landuse is also controlled by the *Local Government Act 1993*, which requires councils to have regard to environmental protection when undertaking activities or when providing goods, services and facilities.

However, the above-mentioned legislation does not adequately protect many of the key fish habitats within the Hawkesbury-Nepean. In particular, the *Fisheries Management Act 1994* makes no mention of key vegetative habitats such as saltmarsh, reeds, aquatic macrophytes and riparian vegetation, while the *National Parks and Wildlife Act 1974* is focused on species rather than habitats. Furthermore, Local Environmental Plans (which form the basis of the landuse controls imposed by local councils) are focused on land-use planning and often do not consider fish habitat.

1.2.3 Current policies, programs and strategies

These clarify, promote and help implement the above-mentioned habitat related legislation and planning instruments, and reflect an increasing awareness of environmental problems on the part of public authorities. Among the many examples relevant to the Hawkesbury-Nepean are the NSW Rivers and Estuary Policy, the NSW Wetland Management Policy, the NSW draft Biodiversity Strategy and the Sydney Regional Coastal Management Strategy. Also, local councils in conjunction with other public authorities and industry have produced management guidelines dealing with issues such as sediment control and on-site waste treatment, and the Hawkesbury-Nepean Catchment Management Trust has been active in the promotion of community awareness. Catchment Management Committees have been identifying issues, setting priorities and co-ordinating action (through community groups such as Bushcare) at the local (sub-catchment) level. Sydney Water has achieved significant reductions in nutrient inputs through upgrades to its sewage treatment plants, and is developing an environmental flow regime in relation to its drinking water storages.

However, in most instances, these policies, programs and strategies do not specifically focus on fish or their habitats. Whilst the recently produced NSW Fisheries document “Policy and Guidelines: Aquatic Habitat Management and Fish

Conservation” does focus on these aspects, it does so on a state-wide basis and does not specifically address all of the issues relating to the Hawkesbury-Nepean.

2. OBJECTIVES OF THIS PLAN

This plan aims to protect key fish habitats within the Hawkesbury-Nepean catchment (Figure 1) by:

- i) building on HPPs Nos 1 and 2 in ways specific to the Hawkesbury-Nepean River System;
- ii) complementing existing policies, programs and strategies by focusing on fish and fish habitats;
- iii) mitigating habitat degradation within the Hawkesbury-Nepean catchment; and
- iv) assisting, where possible, the rehabilitation and/or restoration of previously degraded aquatic habitats.

3. DURATION OF THIS PLAN

The plan will be reviewed and revised at intervals of five years from the date of gazettal.

4. HABITATS TO WHICH THIS PLAN APPLIES

This plan applies to all waters and associated habitats within the Hawkesbury-Nepean catchment. The habitats covered by this plan are those essential for the spawning, nursery, shelter and feeding requirements of fish as defined in the Act and include:

- i) the water itself
- ii) deep pools and reservoirs
- iii) riffles (shallow areas of rapid flow)
- iv) wetlands (both freshwater and estuarine)
- v) floodplains
- vi) mud, silt and sand substrates
- vii) gravel
- viii) rocky reefs
- ix) snags (such as partly submerged fallen trees)
- x) artificial hard substrates (such as wharves and seawalls)
- xi) seagrasses
- xii) marine macroalgae (seaweeds)
- xiii) mangroves
- xiv) saltmarshes
- xv) reeds and other riparian (streamside) vegetation

xvi) freshwater macrophytes (water plants), including ribbonweed (*Vallisneria*)

All of these habitats have been shown by scientific research to be important in the life cycles of one or more species of fish. Further information on the importance of these habitats is available within the NSW Fisheries publication "A status report on the key fish habitats in the Hawkesbury-Nepean catchment" (Hannan 1997). A number of key publications are also listed under 'References And Further Reading' (section 8).

5. ACTIVITIES TO WHICH THIS PLAN APPLIES

Many works, activities and proposals directly or indirectly affect fish habitats within the Hawkesbury-Nepean catchment. This plan applies at all stages of development, including planning, construction, operating and/or decommissioning. Events and activities within the catchment that may have negative impacts on fish habitats, and are therefore of concern to NSW Fisheries, include (but are not limited to) the following:

- i) general (all events and activities)
- ii) pollution
- iii) erosion and sedimentation
- iv) dredging and extraction
- v) reclamation
- vi) construction of breakwaters, jetties, bridges, culverts, ramps and pontoons
- vii) construction and operation of aquaculture facilities
- viii) flood mitigation, drainage and river control works
- ix) clearing of riparian or floodplain vegetation
- x) removal of snags, boulders or rock
- xi) fishing and collecting
- xii) water regulation
- xiii) impeding fish passage
- xiv) boating

Under the Act, NSW Fisheries has regulatory powers with respect to dredging, reclamation, aquaculture, fishing (including the harvesting of aquatic invertebrates), the provision of fish passage and the protection of fish spawning areas, mangroves, seagrasses and most types of macroalgae (see Section 6).

Many other public authorities deal with the above-mentioned events and activities, through direct management and/or community education or consultation. These organisations include (but are not limited to) the following:

- i) local councils
- ii) Department of Aboriginal Affairs
- iii) Department of Agriculture
- iv) Department of Energy
- v) Department of Land and Water Conservation (DLWC)

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- vi) Department of Mineral Resources
 - vii) Department of Urban Affairs and Planning (DUAP)
 - viii) Environment Protection Authority (EPA)
 - ix) Hawkesbury-Nepean Catchment Management Trust (HNCMT)
 - x) Healthy Rivers Commission
 - xi) NSW National Parks and Wildlife Service (NPWS)
 - xii) Roads and Traffic Authority (RTA)
 - xiii) State Rail Authority (SRA)
 - xiv) Urban Transit Authority (UTA)
 - xv) Waterways Authority

6. THE SPECIFIC STRATEGIES OF THIS PLAN

The specific management strategies of this plan are additional to those of HPPs Nos 1 and 2, which apply throughout NSW. Unless otherwise stated, all of the habitats listed under section 4 are addressed by each strategy.

The document "Policy and Guidelines: Aquatic Habitat Management and Fish Conservation" produced by NSW Fisheries should be consulted in conjunction with this HPP. This document details current NSW Fisheries management policies and guidelines in relation to works, activities and proposals likely to affect fish habitat.

6.1 General (all events and activities):

6.1.1 In relation to their environmental consequences, specific works, activities or proposals must not be considered in isolation; even if a single action is judged as likely to cause little damage, the cumulative impacts of this action plus all likely future actions arising from it need to be considered. Such a consideration is particularly important where a work, activity or proposal is likely to set a precedent or create a need/opportunity for additional facilities, or where a development is proposed in stages. Cumulative impacts need to be considered at all steps in the design, planning and development process.

6.2 Pollution:

Under the Act, NSW Fisheries can specify pollution safeguards in permits for aquaculture, dredging, reclamation and the destruction of marine vegetation. NSW Fisheries can also regulate many activities liable to cause pollution within Marine Parks and Aquatic Reserves.

6.2.1 The application of current best management practice in relation to pollution control needs to ensure, as far as possible, the protection of fish habitats within the catchment. This is especially critical with respect to existing habitat corridors. Such corridors refer to linear sections of particular habitat (such as ribbonweed along the edge of a river or seagrass around the edge of an embayment) that are likely to be used by migrating fish and/or that link otherwise separate areas of similar habitat.

6.2.2 Approval authorities should ensure that any area liable to be affected by water pollution as a result of a particular proposal is investigated and/or mapped (with respect to any habitats present) before the event. The extent of such

investigation should depend on the scale of the proposal, and take into account natural spatial and temporal variability.

6.2.3 Any further development of the Hawkesbury-Nepean catchment should only occur if accompanied by adequate provisions for fish habitat conservation. Such provisions include (but are not limited to) the following:

- i) the maintenance of natural creek channels and wetlands;
- ii) the preservation of the maximum amount of native vegetation possible, particularly riparian vegetation;
- iii) the avoidance of flood-prone land where levee banks might be needed;
- iv) the preservation of fish passage;
- v) systems for treating stormwater (such as gross pollutant traps, sedimentation ponds and artificial wetlands);
- vi) measures that minimise sediment escape during clearing and construction;
- vii) the adoption of Australian New Zealand Environment and Conservation Council (ANZECC) guidelines (including both biological and physico-chemical factors) as water quality goals for all immediate receiving waters; and
- viii) appropriate monitoring of fish habitats liable to be affected.

6.3 Erosion and sedimentation:

6.3.1 The application of current best management practice in relation to erosion and sediment control needs to ensure, as far as possible, the protection of all fish habitats, including those in ephemeral wetlands and creeks. Particular attention should be paid to vegetative habitats, gravel beds and areas of boulders or rock.

6.3.2 The planting of bare and/or eroded banks using locally native vegetation needs to be encouraged. However, such replanting and any associated stabilisation works need to avoid damaging adjacent fish habitats, and in particular snags, gravel beds, mangroves and reeds, plus ribbonweed and other native attached macrophytes. Any bank stabilisation works should utilise broken rock and/or timber in order to provide the best possible substitute for natural habitat. *Habitats protected:* riparian vegetation and all adjacent aquatic habitats.

6.4 Dredging and extraction:

Whether or not NSW Fisheries is a determining authority with respect to dredging (or reclamation; section 6.5 below) depends on the circumstances. Under the Act, NSW Fisheries has this power with respect to such works carried out by local government authorities and individuals, provided that the work is not authorised by a relevant (not local) government authority or authorised under the *Crown Lands Act 1989*. Also, the Act prohibits a person from damaging gravel beds where fish are likely to spawn unless authorised under the *Environmental Planning and Assessment Act 1979*. However, NSW Fisheries does not control dredging or reclamation in the Hawkesbury-Nepean if:

- i) it is related to mining;
- ii) it is done under the *Public Works Act 1912*, to maintain or restore a navigation channel; and

iii) it is done by a public authority other than a local government authority.

However, in the last case, a public authority must notify NSW Fisheries of any proposal and consider any concerns thus raised.

6.4.1 In recognition of the damage already done to fish habitats within the Hawkesbury-Nepean system, no new extractive operations should be permitted between the shores or banks of any river or stream, or on land within 50 metres of such shores or banks. *Habitats protected:* all freshwater habitats.

6.4.2 Dredging may be approved for an essential public purpose (e.g. navigation), environmental rehabilitation or areas of unvegetated sand/mud. However, effort should be made not to interfere with existing fish habitat corridors, and sensitive habitats such as riffle zones, wetlands, gravel beds, mangroves, *Posidonia* seagrass and saltmarshes should not be damaged. *Habitats protected:* all those listed, but particularly riffles, wetlands, gravel beds, mangroves, *Posidonia* seagrass, and saltmarshes.

6.5 Reclamation:

6.5.1 Reclamation of aquatic habitats may be approved for an essential public purpose, provided that only unvegetated sand/mud is liable to be affected.

6.5.2 The reclamation of natural streams and creeks should otherwise not occur. The rehabilitation of fish habitats degraded by previous reclamations should be considered in the preparation of Stormwater Management Plans. *Habitats protected:* all stream and creek habitats.

6.6 Construction of breakwaters, jetties, bridges, culverts, ramps and pontoons:

The Act allows NSW Fisheries to regulate these works wherever they involve damage or removal of seagrasses, mangroves or most types of macroalgae. Permits are required from NSW Fisheries under these circumstances, and specific conditions are normally attached to any approvals. In many cases, permits will also be required for associated dredging or reclamation activities. NSW Fisheries can order the removal of new structures or modifications which block fish passage.

6.6.1 The conservation and enhancement of fish habitat should be taken into account in determining the location of such structures.

6.6.2 Structures should be designed to minimise the shading of aquatic plants. Applications for structures that threaten to shade seagrasses, macroalgae, reeds and freshwater macrophytes will be assessed on their merits and according to the guidelines in "Habitat Protection Plan No. 2 - Seagrasses". NSW Fisheries is more likely to approve or support a proposal that involves mitigation of, and/or compensation for, possible impacts. In some circumstances, the provision of extra artificial shelter underneath a structure may help compensate for vegetative habitat loss caused by shading. *Habitats protected:* seagrass, macroalgae, reeds and freshwater macrophytes.

6.6.3 Structures should not compromise existing habitat corridors of seagrasses, mangroves, macroalgae, reeds or ribbonweed. *Habitats protected:* seagrass, mangroves, macroalgae, reeds and ribbonweed.

6.6.4 Structures should not significantly alter natural sediment transport, wave, current or flow patterns, or impede fish passage.

6.6.5 Structures should be designed to maximise their habitat value to fish: surfaces that provide sheltering sites for fish should be used where feasible. For example, a seawall made of broken rocks is much better than one made of smooth concrete. *Habitats protected:* artificial substitute for rocky reef.

6.6.6 Within the estuary, berthing facilities located where it is too deep or turbid for plants to grow on the sea bed should utilise pontoons in preference to fixed walkways. Pontoon sides provide hard substrate that remains just below the surface, where conditions for macroalgal growth are optimised. *Habitats protected:* macroalgae.

6.6.7 Wharf and jetty pylons made of timber should not be treated with toxic chemicals (e.g. for marine borers). Alternatives include using concrete pylons and protecting untreated timber with a polyvinyl (plastic) wrap. These alternatives favour attached macroalgae and invertebrates, and hence provide for better fish habitat without weakening the structure. *Habitats protected:* water and artificial substitute for rocky reef.

6.7 Construction and operation of aquaculture facilities:

Aquaculture requires a permit from NSW Fisheries. Under the Act, aquaculture permits are subject to conditions, including those specifying or relating to the:

- i) type of fish that can be cultivated;
- ii) culture methods to be used;
- iii) erection of structures;
- iv) escape of fish; and
- v) discharge of effluent.

6.7.1 New intensive aquaculture activities (e.g. fish farms) should not be permitted over or within seagrass beds, mangroves, macroalgae, reeds, ribbonweed or other native attached macrophytes; and in any case, cages or similar fish holding facilities should only be placed where there is adequate flushing and sufficient water depth.

6.7.2 New extensive aquaculture activities (e.g. oyster leases) should not be permitted over *Posidonia* seagrass beds, or be allowed to compromise existing habitat corridors of seagrasses, mangroves, macroalgae, reeds or ribbonweed. *Habitats protected:* seagrasses, mangroves, macroalgae, reeds and ribbonweed.

6.7.3 Aquaculture facilities such as grow-out ponds or hatcheries should not release effluent into any freshwater water body, wetland, river or stream, or into groundwater. Effluent should be stored, recycled or irrigated in accordance with EPA guidelines and current best practice. *Habitats protected:* all freshwater habitats.

6.7.4 Aquaculture facilities should not release effluent into any marine or estuarine waters unless the area is well-flushed, and any discharge is in accordance with EPA guidelines and current best practice. *Habitats protected:* all estuarine and marine habitats.

6.7.5 Aquaculture of species not native to the Hawkesbury-Nepean catchment should not be authorised unless stringent escape prevention measures are employed. Fish holding facilities should be built above the Probable Maximum Flood level, and security measures such as fencing, bunding, dry basins and the use of constructed tanks should be required.

6.7.6 The exposure or disturbance of potential or actual acid sulfate soils should not be allowed during the construction, installation, operation or maintenance of aquaculture facilities.

6.8 Flood mitigation, drainage and river control works:

Under the Act, a person is not allowed to obstruct fish passage without appropriate authority, and can be ordered to remove any such obstruction. However, this legislation only applies to new works or where existing structures are modified.

6.8.1 Except as permitted under SREP No. 11 (Penrith Lakes Scheme), no new drains (unless for stormwater) or new floodgates should be constructed. Where such works are permitted, the exposure or disturbance of potential or actual acid sulfate soils should be avoided.

6.8.2 The maintenance and operation of existing floodgates, drains and levees should minimise effects on fish habitat within, downstream and upstream: in particular, the accumulation and/or release of poor quality water (including acid runoff) needs to be eliminated. *Habitats protected:* all habitats within, downstream and upstream of existing floodgates, drains and levees.

6.8.3 Where possible, existing floodgates should be kept open at all times, other than during floods, to allow fish passage and normal tidal exchange. *Habitats protected:* mangroves, saltmarshes and reeds, plus all habitats within wetlands and tributary creeks.

6.8.4 Streams or creeks should not be channelised, even for the control of stormwater. In relation to existing works, the rehabilitation of fish habitats should be considered in the preparation of Stormwater Management Plans.

6.8.5 Artificial levee banks should only be used to protect public health and safety: where levee banks must be used they need to be located landward of any wetland, reeds, mangroves or saltmarshes. *Habitats protected:* floodplains, wetlands, reeds, mangroves and saltmarshes.

6.8.6 Levee banks should not be constructed from potential or actual acid sulfate soils: if the soils on site are unsuitable, local soil not liable to produce acid should be used.

6.9 Clearing of riparian or floodplain vegetation:

The clearing (or otherwise damaging) of mangroves requires a permit from NSW Fisheries. Under the Act, such permits are subject to conditions including those specifying or relating to:

- i) the area or number of plants that can be cleared or damaged;
- ii) the rehabilitation of the site, including the source of any seedlings required; and
- iii) any subsequent monitoring.

6.9.1 Native vegetation (including trees, shrubs and grasses) should be retained wherever possible, particularly where it is within 50 metres of a water body, wetland, river or stream (as measured from the top of the bank or shore): native forest, woodland, bush or scrub should not be cleared or otherwise damaged unless this is necessary for the protection of human life or property. *Habitats protected:* riparian vegetation and floodplain.

6.9.2 Stock access should be managed to ensure the minimum impact on riparian vegetation; for example by the use of fencing in conjunction with watering points beyond the 50 metre riparian zone. *Habitats protected:* riparian vegetation.

6.9.3 Wherever possible, exotic riparian vegetation should be replaced with locally native species, and bare areas be replanted. *Habitats protected:* riparian vegetation.

6.9.4 Aquatic weeds should be controlled as much as possible, using best practice control and disposal methods. *Habitats protected:* all freshwater habitats.

6.10 Removal of snags, boulders or rock:

6.10.1 Snags, boulders or rock should not be removed from any waters unless for an essential public purpose. Where their removal is essential, the material that must be removed should be reoriented in line with the flow, or relocated to a nearby area of water in consultation with NSW Fisheries, in order to minimise any loss of fish habitat. *Habitats protected:* snags and rocky reef / boulders.

6.11 Fishing and collecting:

Under the Act, NSW Fisheries regulates all forms of commercial and recreational fishing, including the catching, harvesting or collection of finfish and aquatic invertebrates (including bait collection): restrictions apply to the size and type of fish that can be taken, the methods used and the times and/or locations that can be fished.

NSW Fisheries are also empowered by the Act to issue permits for the cutting, removal, damage or destruction of marine vegetation. The Act and its Regulations define 'marine vegetation' as mangroves, seagrasses and all forms of macroalgae except 'sea lettuce' and 'bait weed'. Other forms of vegetation, including saltmarsh, reeds and freshwater macrophytes, are not covered by NSW Fisheries legislation. However, they are afforded some protection under legislation administered by NPWS and DLWC.

Current legislation related to dredging and excavation (NSW Fisheries and DLWC) is not enforced with respect to the collection of small amounts of stream bed materials such as sand, gravel and rock by individuals: such collection by a large number of individuals can lead to habitat damage, particularly in easily accessible areas.

6.11.1 Commercial and recreational fishers should use methods that minimise damage to fish habitat or fish stocks; methods that cause excessive damage should be phased out. In particular, commercial trawler operators should use by-catch reduction devices when appropriate and recreational fishers should avoid damaging fish habitats (for example, by not pumping for bait in seagrass beds, and not anchoring in sensitive habitats).

6.11.2 The collection of large amounts of dead macroalgae and non-woody freshwater plants can result in significant habitat loss or damage and should not be permitted. The collection of smaller amounts (less than 5 kg per day) for personal use (e.g. as mulch or fertiliser) is acceptable. *Habitats protected:* all aquatic or intertidal habitats where such plant material occurs.

6.11.3 The collection of any live aquatic plant material requires a permit, with permissible amounts being limited to what one might reasonably need for (say) a home aquarium. In general, only freshwater species should be taken, as marine and estuarine species are extremely difficult to maintain. *Habitats protected:* all living aquatic vegetation.

6.11.4 The collection of sand, gravel or rock found within a creek/stream/river bed should be controlled, with the amounts allowed to be taken being limited as suggested for freshwater plants (see 6.11.3). The private collection of large amounts of rock for purposes such as landscaping should not be permitted. *Habitats protected*: sand, gravel and rock.

6.11.5 The private collection or removal of dead timber from any waters or intertidal areas should be prohibited unless:

- i) it is necessary for reasons of safety, property protection or livelihood as a result of timber being repositioned by natural events such as storms or flood; or
- ii) only loose driftwood is collected.

Habitats protected: snags.

6.12 Water regulation:

6.12.1 Natural stream flows (both the quantity and seasonality of flows) should be retained where possible; if this is not possible, then a regime of environmental flows should be provided in consultation with NSW Fisheries.

6.12.2 The direct effects of water abstraction and impoundments, along with the indirect effects of groundwater extraction, should always be considered in relation to the maintenance/provision of stream flows.

6.13 Impeding fish passage:

Under the Act, a person is not allowed to obstruct fish passage without appropriate authority, and can be ordered to remove any such obstruction. Also, NSW Fisheries can order that a fishway be provided over or through a new or modified dam, weir or reservoir.

6.13.1 Fishways that are effective for a variety of native species should be installed on existing dams and weirs which impede fish passage. Suitable fishway designs for weirs and low dams are available from NSW Fisheries, and designs for high dams are being developed. *Habitats made available*: all aquatic habitats upstream of barriers.

6.13.2 All existing causeways, culverts and floodgates should be reviewed, and removed or altered as necessary, to improve fish passage and water flow. Culverts should be replaced by bridges, or at least enlarged, if they presently impede tidal exchange or fish passage. An inventory of structures in the tidal portion of the Hawkesbury-Nepean is available from NSW Fisheries. *Habitats protected/made available*: all aquatic habitats upstream of barriers.

6.13.3 The design and construction of new causeways or culverts, or modifications to existing ones, should allow for fish passage and adequate water flows. *Habitats protected/made available*: all aquatic habitats upstream of barriers.

6.14 Boating:

The removal or damaging of seagrass and most types of macroalgae requires a permit under the Act. NSW Fisheries and the Waterways Authority will not generally approve additional moorings over seagrass beds.

6.14.1 The boating-related provisions of "Habitat Protection Plan No. 2: Seagrasses" should, where practicable, be extended to cover reeds, ribbonweed and shallow macroalgae beds. To help boat operators recognise where extra care is

needed, the sign-posting of prominent habitat areas may be considered. *Habitats protected*: seagrasses, reeds, ribbonweed and macroalgae.

6.14.2 To assist the re-establishment of riparian vegetation along denuded banks, “no wash zones” should be considered for those river sections where the loss of riparian vegetation is severe. Within a given area, such a zone would only be needed until regeneration was successful. These no wash zones would need to be placed progressively, with the selection of river sections co-ordinated so as to always maintain sufficient areas for activities such as water skiing. *Habitats protected*: riparian vegetation.

7. IMPLEMENTATION OF THIS HABITAT PROTECTION PLAN

7.1 Legal requirements

Section 193 of the *Fisheries Management Act 1994* addresses the implementation of HPPs.

The six parts of this section are:

- 1) The Minister (of NSW Fisheries) is to have regard to any relevant habitat protection plan in the exercise of the Minister’s functions under this Part (Part 7 - Protection of Aquatic Habitats).
- 2) Public authorities are to have regard to any habitat protection plan that is relevant to the exercise of their functions.
- 3) A public authority is to notify the Minister of any function it proposes to exercise that is inconsistent with a habitat protection plan. The Minister may refer any dispute to the Minister responsible for the public authority. If the dispute cannot be resolved by those Ministers, it is to be referred to the Premier for resolution.
- 4) Any such resolution of a dispute is to be given effect to despite anything to the contrary in this section.
- 5) The exercise of a function is not invalid merely because it is inconsistent with a habitat protection plan.
- 6) This section:
 - a) does not render the exercise of a function invalid merely because it is inconsistent with a habitat protection plan; and
 - b) does not require or authorise action that is inconsistent with any statutory or other legal obligation of a Minister or a public authority.

7.2 What has to be done

7.2.1 Public authorities

Public authorities need to recognise that many of their works and activities, as well as proposals with which they deal, may adversely affect fish habitat and the sustainable management of commercial and recreational fisheries.

This HPP requires the conservation of fish habitat to be a primary consideration at all stages (planning or design, construction, operation or management, and

decommissioning) of the 'development' or management processes relating to these works, activities or proposals.

A public authority is therefore required to incorporate the conservation of fish habitat as a criterion in their decision making and management processes. In practical terms, **public authorities must notify NSW Fisheries whenever they (1) intend to undertake works or activities that may affect fish habitat; or (2) consider such a proposal by a third party.** These authorities must then fully consider any advice given to them by NSW Fisheries regarding such works, activities or proposals.

Such notification, with the inclusion of all details, enables NSW Fisheries to assess the proposed works or activities in terms of this HPP and its legislative responsibilities. No works or activities should be undertaken or allowed before this assessment is complete. Any work, activity or proposal that is inconsistent with this plan will need to be discussed with NSW Fisheries. Any disputes will be referred to the responsible Minister and, if necessary, to the Premier.

Public authorities should seek advice from NSW Fisheries if they are unsure whether or not a proposal may directly or indirectly affect fish habitat.

Public authorities are encouraged to incorporate the strategies of this HPP into environmental planning instruments (particularly Local Environmental Plans), and all other relevant policies, management plans, programs and guidelines.

NSW Fisheries recognises that some strategies within this plan are expensive to implement (e.g. those relating to stormwater drain rehabilitation and fishway construction). Public authorities, and local councils in particular, should actively pursue available funding opportunities with the assistance of the HNCMT. Possible sources include the Natural Heritage Trust (NHT) grants scheme and rate-payer funded 'environmental levies'.

Community education will greatly assist the implementation of this plan. Programs that promote an understanding of the river system's problems and a sense of 'ownership' will help people take stock of their individual actions and accept some of the costs involved in reaching solutions.

7.2.2 Individuals

If a proponent is unsure whether a proposal may directly or indirectly affect fish habitat, contact should be made with NSW Fisheries (*Information and Client Services*, Telephone No. 02 95667800). This initial contact will enable proponents to be aware of how their proposal may adversely affect fish habitat. It will also allow the proponent to find out if any consent, notification or further consultation is required.

If consent is required, a permit application form (available at NSW Fisheries Offices) needs to be completed and submitted together with any fee required. Notification or consultation can be effected by a letter to NSW Fisheries. The completed form or letter must provide sufficient information to enable NSW Fisheries to assess the proposal in terms of this HPP. No works or activities should be undertaken before this assessment is complete.

In most cases proponents will also need to notify other public authorities such as the Environment Protection Authority, the Department of Land and Water Conservation, the Department of Urban Affairs and Planning, and local councils.

7.2.3 NSW Fisheries

Assessment process:

NSW Fisheries will normally respond to any permit application or notification within 28 days of receipt, or as required under the rules for Integrated Development Assessment (if applicable). If inadequate information is provided, NSW Fisheries may object to the proposed works or withhold its response until the necessary information is provided.

In some cases, site inspections may be needed before a decision can be made. Any inspections necessary to assess an application will be carried out at a time agreed with the applicant and following the payment of any inspection fee required.

NSW Fisheries may stipulate conditions for any consent given. These conditions may specify the methods by which the work can proceed, any necessary compensation or restoration, circumstances under which any permit can be suspended or cancelled, and any other matter necessary to give effect to the objects of this plan. The conditions may also include a requirement for the monitoring of fish populations and/or changes in their habitat depending on what is relevant to the particular consent. Where the required monitoring is not done, or where it indicates an undesirable impact, NSW Fisheries may suspend or cancel any consent given, and require restoration or compensation work to be carried out at the applicant's expense.

Any application, approval, refusal or notice referred to in this plan will be entered into a register which will be available for inspection at NSW Fisheries' Head Office, Sydney.

Resources available:

Various forms of assistance are available through *Information and Client Services* and/or the *Office of Conservation*, including a range of publications, direct consultation with staff, and field inspections.

Evaluation of the success of this plan:

NSW Fisheries should assess the success of this plan. Possible performance indicators, listed in order from short to long term, include:

- i) the number of relevant matters referred to the department;
- ii) the degree of knowledge of the plan's existence and purpose, both among public authorities and the general community;
- iii) the number of breaches of NSW Fisheries habitat-related legislation;
- iv) the number and value of habitat rehabilitation/restoration works applied for under funding schemes such as NHT;
- v) the number and value of such works actually funded and completed; and
- vi) changes in the condition and distribution of fish habitats.

8. REFERENCES AND FURTHER READING

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9. ACKNOWLEDGEMENTS

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