

Management and protection of marine plants and other tidal fish habitats



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1. Policy vision

This operational policy supports the statutory role of the Department of Primary Industries and Fisheries (DPI&F) in delivering the Queensland Government's priority of protecting the environment for a sustainable future by protecting and managing marine plants and other tidal fish habitats. DPI&F seeks to ensure continued use of fisheries resources (including marine plants, fish and fish habitats) in a sustainable manner by adopting a strategic approach to maintain and enhance marine plant communities in Queensland. DPI&F's roles of protecting and managing marine plants and fish habitats are key drivers for the policy positions expressed in this document.

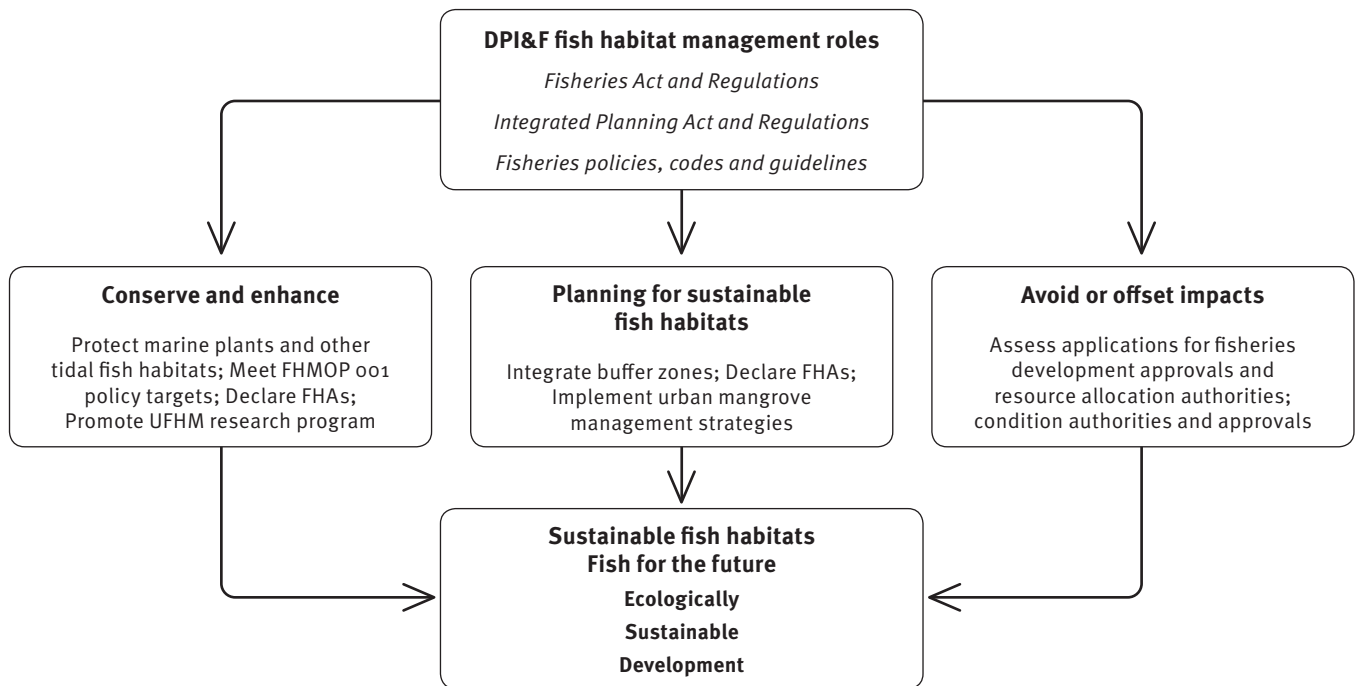


Figure 1. DPI&F tidal fish habitat management framework.

Long-term protection of Queensland's valuable¹ coastal fish habitats and dependent fisheries² is achieved through protection of marine plants and other tidal fish habitats, declaration of Fish Habitat Areas (FHAs), implementation of Urban Mangrove Management Strategies (UMMS) with local governments, securing offsets to restore marine plant communities and conversion of valuable coastal habitats to unallocated state land (thus retaining fisheries resources for the community).

To further support sustainable use of fisheries resources, this operational policy guides the management of development-related impacts on protected marine plants and other tidal fish habitats. Development applications along estuarine and marine shorelines for activities that involve removal, destruction or damage of marine plants require a fisheries development approval under the *Integrated Planning Act 1997* (IPA), and are assessed against the *Fisheries Act 1994* (Fisheries Act).

Expert technical knowledge and extensive experience of the impacts of human activities on marine plants and fish habitats (including mangrove, saltmarsh and seagrass communities) form the basis for DPI&F's policy positions. This policy provides guidance to stakeholders, including developers, the fishing industry and the community, on the circumstances where benefits to the community from a particular development justify temporary or permanent loss of marine plants and other tidal fish habitats.

¹ Commercial fishing is Queensland's 5th largest primary industry with an estimated gross value of production of \$300 million in 2006–07.
² Costanza et al (1997) estimated that the average annual value of ecosystem services provided by fish habitats was A\$21 928/ha.

1.1 Policy principles

The following five policy principles (PP) apply to decisions made when assessing applications for fisheries approvals covered by this policy.

PP1

Proper management to ensure sustainability of marine plants and other tidal fish habitats is of critical importance to fisheries production and to the fishing industry sectors and the general community.

DPI&F supports the proper management, use and protection of Queensland's fisheries resources. The granting of approvals and/or provision of comments on applications for disturbance of fish habitat is to be in accordance with the principles of Ecologically Sustainable Development (ESD).

The purpose of the Fisheries Act includes applying and balancing the principles of ESD and promoting ESD. The meaning and nine (9) principles of ESD are defined in the Fisheries Act, under section 3 (3). DPI&F will apply the precautionary principle, in terms of risk, uncertainty and irreversibility of the proposal to the assessment of fisheries development approval (DA) and resource allocation authority (RAA) applications.

PP2

Strategic management of marine plant communities outweighs adhoc site-specific responses and provides long-term mutual benefits to all stakeholders through enhanced protection for fish habitats and certainty for stakeholder work programs relating to public infrastructure.

DPI&F supports local governments in the continued development of UMMS that recognise whole-of-system issues for the management of infrastructure and public amenities that may impact on mangrove communities within their jurisdiction.

DPI&F will continue to consult with local governments to develop and implement an agreed strategy for the management of riverine and shoreline marine plant (usually mangrove) communities within the jurisdiction of the authority³. The agreed strategy will be signed off by the Deputy Director-General, Fisheries and the relevant officer in the local government. It will enable a collaborative management approach facilitated by a streamlined approval process under the Integrated Development Assessment System (IDAS) for all agreed fisheries-related operational works to be undertaken by the local government (DPI&F have prepared a new self-assessable code for new works (MP06) which will call up the UMMS).

PP3

Adoption of a risk management for marine plants and other tidal fish habitats for low impact development works provides for retention of most fish habitat values and functions while minimising bureaucracy.

DPI&F will continue to work with key stakeholders to develop a risk management approach and to implement self-assessable codes for low impact developments that may disturb or damage marine plants or other tidal fish habitats.

DPI&F is meeting the Queensland Government's requirement to reduce red tape and adopt the least regulatory form of restrictions by developing additional self-assessable codes for minor impact activities in the coastal zone. Fisheries-related self-assessable developments are listed in division 5 of the Fisheries Regulation 1995 (Fisheries Regulation) and schedule 8 of the IPA, and are further explained in section 5 of this policy.

PP4

Public awareness of the protection, diversity, role and value of Queensland's marine plant communities and other tidal fish habitats should be the target of an integrated education, extension, research and regulatory approach.

DPI&F has established an integrated approach through the *Marine fish habitat communication plan* to deliver extension and education materials to a range of stakeholders.

Through the Urban Fish Habitat Management (UFHM) Research Program⁴, DPI&F will use an integrated approach to meet the Queensland Government priority for protecting the environment for a sustainable future. The program will enable DPI&F to inform and involve the community in protecting marine plants and other tidal fish habitats.

³ Appendix 4 outlines DPI&F's protocol for developing mangrove management strategies with local governments.

⁴ A copy of the UFHM Research Program is available at www.dpi.qld.gov.au or call DPI&F on 13 25 23.

PP5**Assessment of coastal development proposals will be based on a number of considerations to avoid, minimise or offset impacts and loss of marine plants and other tidal fish habitats:**

- RAAs or DAs are not supported for:
 - the loss of marine plants and other tidal fish habitats through filling of tidal lands for non-marine oriented works (i.e. works that do not have an overriding requirement to interfere with marine plants, other tidal fish habitats or tidal lands)
 - the destruction or disturbance of marine plants or other tidal fish habitats for views.
- Applications for development works or activities are assessed against criteria that meet the objectives of the Fisheries Act. These include the sustainability, protection and enhancement of marine plants and other tidal fish habitats, where the principles of ESD are applied and balanced.
- Application of self-assessable IDAS codes for low risk (to marine plants and other tidal fish habitats) activities or development works, either for maintenance or for new works, where appropriate.
- The granting of tenure over fish habitats or tidal lands is not supported unless it is for an appropriately sited and justified area for the development of marine infrastructure.

2. Background

All fish habitats, including those that appear to be devoid of vegetation, are important in providing a diverse habitat mosaic essential for maintaining the high biodiversity of aquatic life in Queensland's coastal ecosystems. The primary value of marine plants to fisheries productivity is in their contribution, through photosynthesis, to a detritus-based food web and through the provision of a range of habitats (for shelter, feeding and nursery areas) for fisheries resources⁵.

The direct and indirect values of tidal fish habitats, including marine plant ecosystems, to the fishing sectors, species biodiversity and the wider community are increasingly being understood as research efforts demonstrate the connectivity between healthy coastal ecosystems, ESD and fisheries production⁶. Community values have changed since the early protection of mangroves solely to provide for harvesting for oyster furniture in provisions of the *Fish and Oyster Act of 1914*. For example, in 1929, an annual permit to cut mangroves cost 3 pounds and 10 shillings (which equates to 7 dollars at that time). The objectives of the Fisheries Act now recognise the broader inherent environmental and community values in the protection of marine plants and other tidal fish habitats.

Accelerated climate change has become a key threat to tidal fish habitats. As the interface between land and sea, tidal fish habitats are already stressed because of human-induced or other disturbances. Tidal fish habitats that support the fish stocks on which Queensland's fisheries rely are among those most susceptible to climate change. Fish and marine plants in relatively pristine fish habitats may also be vulnerable if barriers to landward or poleward migration are present.

A broad range of fish habitat management responses is required to effectively sustain the function and diversity of tidal fish habitats to accommodate climate change, such as:

- preserving intact natural habitat (seen as the least expensive and most effective response)
- understanding the inter-annual climate variability and its implications
- developing adaptation programs for landward and poleward habitat shifts
- supplementary management with specific activities for longer-term benefits (e.g. establishing buffers between fish habitats and coastal development)
- adaptive management through review and refinement of practices.

Given the potential scale of climate change and the likely shifts in species' climatic distributions, substantial increases in connectivity across tidal profiles and latitudes may be required, through large-scale buffer corridors and patches of tidal fish habitat. The essential feature is adequacy of interconnected tidal fish habitats for large-scale ecological processes to continue. This will be achieved by coordinating habitat management across land tenures and uses (e.g. declared FHAs and adjacent vegetation) and across scales (e.g. connecting remnants at one scale or biogeographic regions at another scale). Appendix 5 provides further information on managing climate change impacts on tidal fish habitats.

Current fisheries legislation reflects contemporary community values that acknowledge the roles of marine plants and other tidal fish habitats in: fisheries production; provision of essential ecosystem services, such as nutrient uptake and erosion control; protection from storm surge; community use and access and plant and animal biodiversity. The legislation now protects all types of marine plants (including mangrove, saltmarsh, seagrass and algal communities) and all parts of marine plants (leaves, roots, branches etc.), irrespective of whether they are trees, shrubs or groundcover plants. Dead or fallen marine plants are also protected in recognition of the important roles these materials play in the food web and in providing habitats. This protection applies irrespective of the land tenure on which marine plants occur; for example, marine plants are protected whether they occur on freehold, leasehold, permit to occupy or any other form of state tenured or untenured lands.

The Fisheries Act does not apply to the unintentional taking or possession of marine plants (section 12). Consequently, a DA is not required for day-to-day activities (such as boating, beach-going and legal fishing) that have no intent to disturb or impact on marine plants.

⁵ See *Fisheries Act 1994* (Schedule, Dictionary) for definition of fisheries resources (includes fish and marine plants) and fish (section 5, includes finfish, crustaceans, shellfish, worms etc).

⁶ See papers presented at the first International Symposium on Mangroves as Fish Habitat 2006, also Kneib (1997), Lee (2005), Skilleter et al (2005) and Sheaves (2005).

3. How to use this document

3.1 Context

The objectives of the Fisheries Act and the principles of ESD recognise the inherent environmental and community value of Queensland's coastal wetlands. Mangrove, seagrass and saltmarsh communities, rocky foreshores, mud flats, reefs, sand bars and tidal waterways are key parts of the diverse mosaic of fish habitats that support fisheries resources. Protecting these habitats and the connectivity between them sustains fish for the future and the fishing industries and communities that depend on them. DPI&F protects key coastal regions within declared FHAs, and manages and controls impacts on marine plants and fish passage⁷.

This operational policy supports the role of DPI&F in delivering the Queensland Government's priority of 'protecting the environment for a sustainable future' by protecting and managing marine plants and other tidal fish habitats. DPI&F seeks to ensure continued use of fisheries resources (including marine plants and tidal fish habitats) in a sustainable manner through a strategic approach to maintain and enhance marine plant communities in Queensland and reduce or remove the impacts of inappropriate development.

Long-term protection of Queensland's coastal fish habitats is achieved by declaring FHAs, implementing UMMS with local governments, securing offsets to better manage marine plant communities and converting coastal habitats to unallocated state land (thus returning community resources to the state).

3.2 Application

This policy contains background information on the protection and management of marine plants and other tidal fish habitats, policies relating to assessment of development activities and management of related impacts, and a description of how to apply the policy in terms of approving, or not approving, a DA. The policy also provides guidance where outcomes will not meet long-term objectives of sustainable marine plant or other fish habitat management and cannot justify proposed impacts.

Expert technical knowledge and extensive experience with the effects of certain development activities on marine plants and other tidal fish habitat including mangrove, saltmarsh and seagrass communities form the basis for DPI&F's policy principles described in this document. It is recognised that proposals will arise where adherence to this policy may not be possible due to unusual circumstances. On these occasions, justification for departing from the policy should be carefully documented.

⁷ See FHMOP 002 and FHMOP 008 for DPI&F policy regarding the declaration of Fish Habitat Areas and matters relating to fish passage.

4. Policy targets

Management targets based on spatial extent of marine plants have been set to ensure fisheries production is sustained:

1. Maintain the relative distribution of each of the components of the marine plant community statewide to 90% or greater of the distribution levels that existed in 1990.
2. Maintain the extent of marine plant distribution within local government areas at 80% or greater of the level that existed in 1990 for all natural areas, and to 50% or greater of 1990 levels for constructed areas.

Delivery on the above targets is partly achieved by incorporating information on the values and distribution of marine plants and other tidal fish habitats into local government planning schemes and other planning instruments. Marine plant distribution is a trigger within the electronic application lodgement process, Smart eDA.

Marine plant distribution data has been provided to all coastal local governments as an outcome of the DPI&F Coastal Wetlands Mapping Program. This data is accessible through the Coastal Habitat Resources Information System (CHRIS) website <http://chrisweb.dpi.qld.gov.au/CHRIS/> or by request from the data coordinator.

Engaging local governments to develop and implement UMMS is another mechanism for delivering on these policy targets.

5. Statutory obligations

Marine fish habitat is managed under the provisions of the Fisheries Act for the protection of marine plants (s.123), the declaration of FHAs (s.120) and the restoration of damaged or destroyed fish habitats (s.124, s.125). Fisheries resources and fish habitats are listed as state resources in items 11, 12 and 13 of schedule 10 of the Integrated Planning Regulation 1998 (Integrated Planning Regulation). This assigns a head of power and role to assess impacts of coastal development. The chief executive can request evidence that a development is consistent with an allocation of, or an entitlement to, the resource. DPI&F's role in the issue of resource entitlement for tidal works is set out in the Memorandum of Agreement between DPI&F, the Department of Natural Resources and Water (NRW) and the Environmental Protection Agency (EPA).

While the head of power for the protection of marine plants remains with the Fisheries Act, the process of assessing and issuing approvals for fisheries-related development activities is delivered through the IDAS of the IPA. Since the integration of the Fisheries Act with the IPA from 1 March 2005, RAAs and/or DAs are required to damage, destroy or remove marine plants, construct waterway barriers or undertake works in a declared FHA.

Approvals under the Fisheries Act and the IPA are not required where a collection authority to take native biological material has been issued under the *Biodiscovery Act 2004*.

Depending on the type of development, DPI&F is an advice or concurrence agency, or an assessment manager under the IPA and must comply with the strict timeframes for assessment of DAs provided for under IDAS.

The provisions of the Fisheries Regulation include section 52 on the issue of RAAs. Part 5, division 3A provides for the issue of fisheries DAs, and subdivision 4 provides for the conditions that may be applied to fisheries DAs.

The types of fisheries DAs that may be applied for are provided in schedule 8, part 1 Assessable development of the IPA. Activities that do not require a fisheries development approval⁸ are listed in schedule 8, part 2 of the IPA.

5.1 Applications for material change of use and reconfiguration of a lot

Prior to the roll-in of the Fisheries Act to the IPA, developers who had obtained approval for material change of use (MCU) or reconfiguration of a lot were sometimes unable to progress their proposals further because the development could not comply with the objectives of the Fisheries Act. Part 3.2.2A of the IPA was introduced to ensure impacts to marine plants were assessed at the initial stage of the application for an MCU or reconfiguration of a lot.

Section 3.2.2A of the IPA (see extract below) requires that a development application for an MCU or reconfiguration of a lot must also have an approved development permit for operational works for marine plant disturbance, or include an application for operational works for marine plant disturbance, even though the operational works will take place at a later stage. Given that the MCU is deemed to include an application for a DA for marine plants, DPI&F as a concurrence agency has the ability to request further information during assessment of the application.

Section 3.2.2A (extract from the IPA) - Approved operational works for marine plants required for certain developments

- (1) This section applies if, at the time an application is made—
 - (a) a material change of use of premises or reconfiguration of a lot, the subject of an application, may not be performed unless a development permit exists for operational work that is the removal, destruction or damage of a marine plant on or near the premises or lot; and
 - (b) there is no development permit for the operational work; and
 - (c) approval for the operational work has not been applied for in the application or a separate application.
- (2) The application is taken also to be for the operational work.

⁸ Activities covered by a fisheries self-assessable code require pre-works notification and may still require an approval from another agency. It is the proponent's responsibility to check for additional approvals needed prior to starting works.

5.2 Objectives of the Fisheries Act

The Fisheries Act is an Act for the management, use, development and protection of fisheries resources and fish habitats and the management of aquaculture activities, and for related purposes. This policy supports decisions required by fisheries legislation.

Main purpose of Act (extract from section 3 of the Fisheries Act):

- (1) The main purpose of this Act is to provide for the use, conservation and enhancement of the community's fisheries resources and fish habitats in a way that seeks to—
 - (a) apply and balance the principles of ecologically sustainable development; and
 - (b) promote ecologically sustainable development.
- (2) In balancing the principles, each principle is to be given the relative emphasis appropriate in the circumstances.

How particular purposes are to be primarily achieved (extract from Section 3A of the Fisheries Act):

- (1) The main purpose of this Act is to be primarily achieved by—
 - (a) giving the chief executive appropriate powers to perform the chief executive's functions under this Act; and
 - (b) providing for the following—
 - (i) the management and protection of fish habitats
 - (ii) the management of commercial, recreational and indigenous fishing
 - (iii) the prevention, control and eradication of disease in fish
 - (iv) the management of aquaculture.

5.3 Protection of marine plants

Section 123 of the Fisheries Act provides the head of power for marine plant protection and states that a person must not unlawfully—

- (a) Remove, destroy or damage a marine plant; or
- (b) Cause a marine plant to be destroyed or damaged.

Maximum penalty—3,000 penalty units⁹.

Example of removing a marine plant—removing seagrass leaves from a beach or foreshore.

Example of destroying a marine plant—burning saltcouch.

Example of damaging a marine plant—pruning or trimming mangroves.

Marine plant protection applies **irrespective of the tenure** (e.g. unallocated state land and all state tenured lands, including private freehold and leasehold lands) of the land on which the plant occurs, the time the plant has been growing at the location, or the degree of or purpose of the disturbance.

⁹ Penalties are described in section 76T of the *Fisheries Act* and section 4.3.1 of the IPA.

5.4 Marine plant definition

The meaning of marine plant is given in section 8 of the Fisheries Act¹⁰:

- (1) 'Marine plant' includes the following—
 - (a) a plant (a 'tidal plant') that usually grows on, or adjacent¹¹ to, tidal land, whether it is living or dead, standing or fallen;
 - (b) the material of a tidal plant, or other plant material on tidal land;
 - (c) a plant, or material of a plant, prescribed under a regulation or management plan to be a marine plant.
- (2) 'Marine plant' does not include a declared plant under the *Land Protection (Pest and Stock Route Management) Act 2002*.

Marine plants are also included in the definition of fisheries resources given in the Fisheries Act (schedule, dictionary, section 4).

The definition of marine plants is broad, and includes macro and micro marine plants as well as the material of tidal or other plants on tidal land. Marine plants include mangroves, seagrass, samphires, saltcouch and saltmarsh plants, algae and other tidal plants growing adjacent to the tidal zone, landward and seaward (see Appendix 1).

Material of a tidal plant relates to all parts of mangroves or other marine plants, such as bark, leaves, stems, roots, flowers or seeds.

Dead marine wood, including flotsam, falls within the marine plant definition as it provides material to the food chain as it breaks down, shoreline protection from wave action and habitat for marine animals, such as shipworms and gastropods.

5.5 Section 60A of the Fisheries Act

Subdivision 2A and section 60A of the Fisheries Act require that a decision about an application for an RAA under the Fisheries Act 'must have regard to the impact of the development mentioned in the authority on each of the following:

- (a) coastal management under the *Coastal Protection and Management Act*;
- (b) the protection of Queensland waters as required under the *Environmental Protection Act*; and
- (c) the management of marine parks under the *Marine Parks Act*.

5.5.1 State and regional Coastal Management Plans

The *Coastal Protection and Management Act 1995* requires that regional coastal management plans be developed for the Queensland coast. The *State Coastal Management Plan: Queensland's Coastal Policy* commenced on 27 February 2002, and provides the policy framework for the regional coastal management plans.

The coast has been divided into 11 regions, seven of which have completed or are in the process of drafting a regional coastal management plan. You can view these management plans at www.epa.qld.gov.au/environmental_management/coast_and_oceans.

The state and regional coastal management plans have the effect of state planning policies. Assessment managers and referral agencies are therefore required to have regard to the plans' outcomes, principles and policies for resource entitlement and in the development assessment and decision stages of the IDAS for relevant applications.

¹⁰ Current copies of legislation are available on the Queensland Parliamentary Council website www.legislation.qld.gov.au/Legislation.htm or may be purchased from GoPrint (tel. 07 3246 3399 or 1800 679 778 for callers outside Brisbane area or email retail@goprint.qld.gov.au).

¹¹ Guidance on the application of the term 'adjacent' in relation to marine plant approvals is provided in part 9 of this document.

5.5.2 State Development and Public Works Organisation Act 1971

Large-scale coastal development proposals that have state government support for their implementation may be designated as a ‘significant project’ and/or a ‘prescribed project’ under the *State Development and Public Works Organisation Act 1971*. They may also require public notification and the preparation of an environmental impact assessment study and/or environmental impact statement for the Coordinator General.

For prescribed projects, the Coordinator General may issue the decision maker with a ‘progression notice’ (i.e. a directive to complete an administrative process within a specified timeframe), a ‘notice to decide’ (i.e. a directive to make a decision on a development application within a specified timeframe), and/or a ‘step in notice’.

In the latter case, the Coordinator General takes over the assessment and decision making process, while the original decision maker is required to provide assistance. In these circumstances, any advice or assistance from DPI&F should be based on the intent of the Fisheries Act and the provisions of this and any other relevant fish habitat management policies. This would include any requirement for offsets (mitigation).

5.5.3 Native title and cultural heritage considerations

In circumstances where DPI&F is the assessment manager for a DA, or in some circumstances where an RAA is required, DPI&F must consider the impact of any approval (a ‘future act’) on native title. In these instances, the current Department of Natural Resources and Water Native Title Work Procedures Manual¹² must be followed to determine whether future act notification needs to be sent to any registered native title claimants, representative bodies or determined native title holders, as required under the Commonwealth *Native Title Act 1993*.

If DPI&F is the assessment manager for a development application, the responsibilities of the authority holder with regard to cultural heritage statutory obligations under the *Aboriginal Cultural Heritage Act 2003*, or the *Torres Strait Islander Cultural Heritage Act 2003*, also need to be included as advice on the decision notice¹³.

5.5.4 References to marine plants in other legislation

The *Fisheries Act 1994* is the primary legislation relevant to the management of marine plants. The *Vegetation Management Act 1999* and the *Nature Conservation Act 1992* do not have the specific protection and management provisions for marine plants.

¹² Native Title Work Procedures are available on the NRW website: www.nrw.qld.gov.au/nativetitle/index.html

¹³ Duty of Care Guidelines are available on the NRW website: www.nrw.qld.gov.au/topics/index.html

6. Habitat approvals covered by this policy

The development application process is applicant driven, and the IPA provides a framework to manage the application process through IDAS. All assessable development, unless it is exempt or self-assessable, requires the lodgement of an IDAS development application. This policy is to be applied in the assessment of IDAS applications for operational works for the removal, destruction or disturbance of marine plants and other tidal fish habitats.

The Fisheries Act and the IPA allow for the lawful disturbance of marine plants to facilitate development of community facilities, infrastructure, research and other legitimate activities through the granting of approvals and authorities or through adherence to a specified self-assessable code. A separate policy (FHMOP 002) covers habitat disturbance from activities associated with development works within declared FHAs.

The self-assessable codes, authorities and approvals listed below relate to the disturbance of marine plants and other tidal fish habitats.

6.1 Self-assessable codes

Self-assessable codes are not 'approvals' but do provide authorisation for fisheries development works. Self-assessable codes are listed in schedule 8 of the IPA and in division 5, section 113F of the Fisheries Regulation. Codes for self-assessable development have been developed to authorise **minor impact development works** associated with the collection of dead marine wood, maintenance of existing lawful structures, or research, educational or monitoring purposes that may disturb marine plants or fish habitats. Code MPO6 deals with self-assessable development for minor impact new works. The current codes for self-assessable fisheries development are:

- MPO1—removal of dead marine wood on unallocated state land for trade or commerce. (An RAA is required.)
- MPO2—maintenance works on existing lawful structures (other than powerlines and on-farm drains) in a declared FHA or involving the removal, destruction or damage of marine plants.
- MPO3—on-farm drain maintenance works involving the removal, destruction or damage of marine plants.
- MPO4—maintenance works on powerlines and associated powerline infrastructure in a declared FHA or involving the removal, destruction or damage of marine plants.
- MPO5—works for educational, research or monitoring purposes in a declared FHA or involving the removal, destruction or damage of marine plants.
- MPO6—minor impact works in a declared FHA or involving the removal, destruction or damage of marine plants. (An RAA is required for certain works in a declared FHA.)

No further approvals are required from DPI&F provided proposed works can meet the criteria set out in the relevant self-assessable code—except MPO1, which requires an RAA, and MPO6, which requires an RAA for certain works in a declared FHA. Prior notification to DPI&F of activities to be carried out under a self-assessable code is still required to allow for monitoring and compliance checks. **Approvals may still be required** from other local or state government agencies, depending on the nature of the activity. Copies of the codes and application forms for fisheries development approvals are available from the DPI&F website <www.dpi.qld.gov.au> or by phoning DPI&F on 13 25 23.

6.2 Resource allocation authorities (RAAs)

RAAs are a form of resource entitlement (see section 7.1 of this policy) under the IPA but are assessed outside of IDAS and are issued to the individual while identifying a specific area for the proposed works. RAAs allocate access to or interference with specific state lands and are linked to a DA or self-assessable code that subsequently authorises the works. Certain development works may not be applied for or carried out without evidence of resource entitlement.

Under the Fisheries Act, RAAs are issued for collection of dead marine wood on unallocated state lands, works or related activities in a declared FHA, and tidal aquaculture.

More than one RAA may be issued over a particular area to enable different applicants to undertake different activities. For example, where an RAA has been issued to an applicant for building a jetty in a declared FHA, an RAA could be issued to another applicant to undertake research works within the same location (if not covered under a self-assessable code).

However, where an RAA has been issued to an applicant for collection of dead marine wood on unallocated state land (USL), no further RAA will be issued in the same location. This restriction is to manage the level of impact from collection.

6.3 Fisheries development approvals (DAs)

Fisheries DAs are issued for disturbances to marine plants, works or related activities within a declared FHA, aquaculture and waterway barrier works as defined under the IPA. For fisheries DA applications, DPI&F will be a concurrence agency when EPA, NRW, a Port authority or the local government is the assessment manager. If the application also includes a development that is assessable against the planning scheme, the local government will be the assessment manager and DPI&F will be concurrence agency and will assess the disturbance to marine plants against the Fisheries Act.

If an application for material change of use triggers involvement by the Coordinator General (CoG), the operation of section 3.2.2.A of the IPA may result in DPI&F not being a concurrence agency, and an operational works approval for marine plant disturbance may not be required. However, DPI&F will be involved in the Environmental Impact Statement (EIS) process¹⁴ and recommend relevant conditions to be included in the CoG report.

The following works or activities require a fisheries DA and may also an RAA before they can be legally carried out, unless covered by a self-assessable code:

- aquaculture (defined as material change of use under the IPA)
- removal, disturbance or destruction of marine plants (defined as operational works under the IPA)
- works within a declared FHA (defined as building works or operational works under the IPA)
- waterway barrier works (defined as operational works under the IPA).

For more information on definitions of development, consult the legislation or visit the IPA website www.ipa.qld.gov.au/main/default.asp.

6.4 Conditions on fisheries development approvals

Section 76L of the Fisheries Act sets out conditions the chief executive may impose on fisheries DAs for the removal, destruction or damage of marine plants. The following is an extract¹⁵ from the Fisheries Act (section 76L), outlining the types of conditions that may be imposed on a fisheries development approval:

- (1) This section applies to a fisheries development approval for 1 or more of the following—
 - (a) building work in a declared fish habitat area;
 - (b) carrying out operational work completely or partly within a declared fish habitat area;
 - (c) carrying out operational work that is the removal, destruction or damage of marine plants.
- (2) Without limiting section 76L, the chief executive may impose on the approval conditions about 1 or more of the following—
 - (a) disturbance to—
 - (i) fisheries resources or a fish habitat; or
 - (ii) commercial, recreational and indigenous fishing;
 - (b) the type of works that may be undertaken within or adjacent to a declared fish habitat area;
 - (c) buffer zones between the development and fisheries resources, a fish habitat, or a declared fish habitat area;
 - (d) the timing of the development, having regard to fish migration, fish spawning and the flowering and fruiting of marine plants;
 - (e) mitigation (offset) measures for any loss of fish habitat;
 - (f) the management of the impact of acid sulphate soil on fisheries resources or a fish habitat;
 - (g) monitoring the impact of the development on fisheries resources or fish habitat within or adjacent to the development area.

¹⁴ For information on the EIS process, see the Department of Infrastructure and Planning website www.infrastructure.qld.gov.au

¹⁵ Copies of legislation are available from the Office of the Queensland Parliamentary Counsel website: www.legislation.qld.gov.au (from the home page, click on the 'Legislation' tab and select the appropriate alphabetical directory, such as 'F' to find the *Fisheries Act 1994*).

(3) In this section—

development area, in relation to development, means the area mentioned in the development approval or the resource allocation authority relating to the development.

6.5 Fees

Assessment fee levels for RAAs and fisheries DAs are gazetted and set out in division 4, sections 110O and 110P and schedule 9 of the Fisheries Regulation. Fees are not negotiable. The *Guide to Assessment Fees for Fisheries Development Applications*¹⁶ provides the framework for setting the appropriate level of assessment required for proposals and the fee level this attracts for the following fisheries DAs:

1. Works in declared Fish Habitat Areas:
 - 1.1 Resource allocation.
 - 1.2 Development application.
2. Marine plant disturbance.
3. Dead marine-wood collection.
4. Constructing or raising a waterway barrier:
 - 4.1 Fish movement exemption notice.
 - 4.2 Development application.
5. Aquaculture developments:
 - 5.1 Resource allocation.
 - 5.2 Development application.
6. Other fees

Fees required include the development application fee, assessment manager fee (where DPI&F is the assessment manager) and in some cases an RAA application fee. There are also fees for requesting amendment of a DA, amendment of an RAA, amendment of conditions of a DA or RAA and for extension of a currency period for either.

6.6 Fee waiving policy

Fisheries Act approvals

Under section 113 of the Fisheries Regulation, the chief executive may refund or waive a fee payable for an authority under the Fisheries Act. Where fisheries-related community benefits of a proposal can be established, fisheries officers refer to the DPI&F Marine Fish Habitat Implementation Guide for fee waiving/refunding policy for fisheries approval applications.

Integrated Planning Act approvals

Section 113 of the Fisheries Regulation may not be used to waive fees charged for a concurrence agency assessment or for assessment manager, as these fees are payable for fisheries DAs under the IPA. The chief executive, however, may refund all or part of the fees received.

¹⁶ The *Guide to Assessment Fees for Fisheries Development Applications* is available on the DPI&F website: www.dpi.qld.gov.au or by telephoning DPI&F on 13 25 23.

6.7 Penalties

Penalties for carrying out fisheries development without a permit are set out in section 76T of the Fisheries Act and section 4.3.1 of the IPA and have a maximum level of 3000 penalty units or \$225 000. Penalties for a person who unlawfully removes, destroys or damages a marine plant or causes the removal, destruction or damage of marine plants are set out in section 123 of the Fisheries Act, and have a maximum of 3000 penalty units. Penalties also apply under section 76U of the Fisheries Act for non-compliance with conditions of development approvals.

Fisheries Infringement Notices (FINs) are to be introduced for minor offences, such as non-compliance with codes for self-assessable development.

6.8 When the provisions of the Fisheries Act do not apply

Under section 12 of the Fisheries Act, an approval may not be required for disturbance of marine plants in the following circumstances:

- (a) The unintentional taking of regulated fish and marine plants if the fish or marine plants are not intentionally or recklessly injured or damaged and are immediately put back; or
- (b) The unintentional possession of regulated fish or marine plants by a person if the fish or marine plants are not intentionally or recklessly injured or damaged and the person cannot, because of circumstances beyond the person's control, put the fish or marine plants back immediately they come into the person's possession.

6.9 Aborigines' and Torres Straits Islanders' rights to take fisheries resources etc.

Under section 14(1) of the Fisheries Act, an Aborigine or Torres Strait Islander may take, use or keep fisheries resources, or use fish habitats, under Aboriginal tradition, or Island custom. In these circumstances, an approval is not required for disturbance of marine plants or other tidal fish habitats.

7. Development approval and resource allocation authority application assessment objectives and criteria

Lodgement of an application for a fisheries RAA or DA is not required if there are no likely impacts to marine plants and other tidal fish habitats as a (direct or indirect) result of the proposal. An application is required for all impacts to fish habitats (within declared FHAs) or marine plants that are likely to result from a coastal development proposal, unless the impacts are minor and covered under a self-assessable code.

RAA applications are assessed separately to DA applications. At the resource allocation stage, DPI&F must satisfy itself that the proposed use of the state resource is appropriate and in keeping with the objectives of the Fisheries Act. RAAs do not authorise any carrying out of development works.

At the DA assessment stage, DPI&F must satisfy itself that the impacts from any proposed works are managed and are acceptable in terms of the Fisheries Act objectives and relevant DPI&F policies and guidelines. The two processes are linked through the requirement to provide evidence of resource entitlement when submitting a development application for certain development works on state lands. However, the IPA requires that the RAA be assessed before the DA application can be lodged.

A pre-lodgement meeting (for either an RAA or DA application) with DPI&F assessment staff is highly recommended. Mutual benefits include provision of adequate information to support timely assessment of applications.

Applications for RAAs and fisheries DAs must comply with the provisions and requirements of the relevant parts of the Fisheries Act and the IPA before they may be lodged for assessment. The IPA sets out the minimum requirements for information that must be provided with a development application. Fisheries DAs on state lands cannot be processed unless all required RAAs and/or other evidence of resource entitlement has been obtained. Use or interference with state land outside of declared FHAs may require resource entitlement from other state agencies (e.g. for tidal works or quarry material).

7.1 Resource entitlement.

To assist inter-agency resource entitlement¹⁷ coordination and consultation, DPI&F is party to the state agency Memorandum of Agreement¹⁸ (MoA) for coordination and provision of evidence of resource entitlement for tidal works, including prescribed tidal works involving state resources.

DPI&F provides evidence of resource entitlement for marine plants for the collection of dead marine wood on USL through the issue of a RAA. DPI&F is currently developing a policy position in response to item 11 in schedule 10 of the *Integrated Planning Regulation* to clarify when the department provides resource entitlement for interference with fisheries resources and fish habitats allocated under the Fisheries Act that are not already dealt with in the MoA.

A recent example of where DPI&F has issued a resource entitlement for marine plants not covered by the current MoA was for trimming marine plants on USL that was not associated with maintenance of an existing structure or for construction of a structure.

In addition to the assessment objectives and criteria, development proposals are also considered in terms of their compatibility with other relevant legislation, fisheries policies and guidelines and previous decisions. The proposal must be in keeping with the principles of fisheries policies or must otherwise demonstrate special circumstances to show why policies should not be applied or must be varied.

Policy

- Coastal development proposals should avoid impacts to marine plants and other tidal fish habitats.
- Proponents are advised to assess the likely impacts of their proposal on marine plants and other tidal fish habitats and seek to remove or reduce those impacts to the maximum extent possible.
- The assessment objectives and criteria outlined below are to be applied to properly made RAA and DA applications that may impact on marine plants or other tidal fish habitats.

¹⁷ Fisheries resources and fish habitats are listed as state resources in items 11, 12 & 13 of schedule 10 of the *Integrated Planning Regulation 1998*.

¹⁸ DPI&F staff can access a copy of the MoA on the department's intranet site.

7.2 Assessment objectives

Decisions about applications for RAAs or fisheries DAs must also take into account the following assessment objectives:

- (a) ensuring fish habitat resources are used in an ecologically sustainable way
- (b) maintaining continuity of access of fish species to fish habitats
- (c) ensuring the minimisation of adverse impacts of human activities on fish habitat resources
- (d) ensuring equitable community access to fish habitat resources
- (e) achieving the optimum community, economic and other benefits obtainable from fish habitat resources, taking into consideration a) to d).

7.3 Assessment criteria

Each proposal is assessed on its merits and its capacity to satisfy the policy principles. An assessment report is prepared for the delegated officer that includes a description of the proposal and assessment against the following assessment criteria:

- impacts
- rights to undertake works must be demonstrated
- benefits
- offset measures
- hardships

7.3.1 Impacts

All proposals or offers to offset unavoidable adverse impacts to marine plants, tidal lands or other tidal fish habitats and community access, must be in accordance with DPI&F policies.

Unavoidable non-minor impacts to marine plants, other tidal fish habitats, fisheries productivity, fisheries resources and the fishing industry must be justified, usually with a high level of benefit to the state and/or community.

- Any relevant options or alternatives of lesser impact (location, works, design, timing of works, etc.) to the current proposal must be considered and the reasons for not using the lesser impact options documented and justified. For example, a piled structure is preferred to a causeway over tidal lands due to the smaller footprint of long-term disturbance.
- All feasible impact reduction measures should be explored and detailed in the proposal. Impact reduction measures required to reduce the overall impact to fisheries resources and fish habitats from development activities may include:
 - on-site (e.g. work methods, site redesign, environmental set backs and buffers)
 - off-site (e.g. habitat exchange, research funding) measures.

7.3.2 Rights to undertake works must be demonstrated

The proponent's rights or eligibility to undertake the works or activity are indicated by:

- proof of tenure or resource entitlement over the tidal area or land abutting the tidal area (i.e. the proponent is the owner or has permission of the owner of the land)
- a valid RAA issued under the Fisheries Act (in the case of collection of dead marine wood from unallocated tidal lands)
- precedents and previous decisions or prior DPI&F approvals for the proposed works or activity, as demonstrated by the proponent
- the proponent's role as the responsible agency for legislative or community requirements and their possession of a valid RAA, where appropriate.

7.3.3 Benefits

The private, community, fisheries and/or environmental benefits of the proposal and any offsets to counter unavoidable impacts must justify the impacts from a fish habitat management viewpoint.

7.3.4 Offset measures

A requirement for offsets is a key component of assessment and decision-making undertaken by DPI&F in its management of marine fish habitats in Queensland. DPI&F has developed the Fish Habitat Management Operational Policy FHMOP 005¹⁹ for guidance to assessment officers and developers. The policy outlines the requirements for offsets of marine fish habitat loss due to impacts from activities that disturb marine plants or other tidal fish habitats, or interfere with declared FHAs. Offsets may also form part of any approval under the *State Development and Public Works Organisation Act 1971*.

All information provided is considered when assessing applications. Agreement with offset options forms part of the assessment process, which may be included in a Deed of Agreement linked to a condition of the approval (section 76L of the Fisheries Act applies).

7.3.5 Hardships

Positive and negative ramifications of any decision (issue or refusal, approval conditions) to the applicant, fish habitats and to the department need to be evaluated and documented.

7.4 Appeals

RAA decisions can be appealed (under section 196 of the Fisheries Act) by the applicant and affected third parties granted standing by the Fisheries Tribunal²⁰. Individuals affected by and dissatisfied with an RAA decision may lodge a Notice of Appeal to the Fisheries Tribunal within 28 days of having received the decision notice.

The grounds on which the appeal may be made are one or more of the following:

- (a) the decision of the chief executive was contrary to the Fisheries Act;
- (b) the decision of the chief executive was manifestly unfair;
- (c) the decision of the chief executive will cause severe personal hardship to the appellant.

However, the following decisions can not be appealed against—

- (a) the chief executive about policy;
- (b) a decision of the chief executive under the Planning Act;
- (c) a decision of the chief executive about starting or continuing a prosecution against a person for an offence against the Fisheries Act;
- (d) a decision of the chief executive about an officer or employee of the department in the person's capacity as an officer or employee;
- (e) a decision of the chief executive about delegating a power by the chief executive;
- (f) a decision of the chief executive about making a management plan or declaration;
- (g) a decision of the chief executive about appointing a person as an inspector.

The IPA has introduced a separate process for dealing with appeals to decisions made by DPI&F on fisheries DAs.

Fisheries DA decisions cannot be appealed against through the Fisheries Tribunal. Appeals about DAs are dealt with through the Planning and Environment Court. Chapter 4, part 1, division 8 of the IPA outlines how an applicant may appeal. Third parties cannot appeal fisheries DA decisions (except in cases where public notification is required). The appeal must be initiated within 20 business days after the decision notice or negotiated decision notice is given to the applicant.

¹⁹ *Mitigation and compensation for works or activities causing marine fish habitat loss* (FHMOP 005) is available on the DPI&F website at www.dpi.qld.gov.au/fishweb

²⁰ For more information about the Fisheries Tribunal, visit www.fisheriestribunal.org/default.asp

8. Works that may be approved

The information presented here is for the use of DPI&F assessment officers and prospective applicants. Additional notes are provided for the assessment of applications that require code assessment and implementation of the assessment criteria outlined in section 7 of this policy. Applicants should also use the current DPI&F application form²¹ and guidelines. This information should be used in conjunction with section 9 to determine if the proposed activity is compatible with this policy.

Proposals for works impacting on marine plants and other tidal fish habitats generally fall into one of the following two development types:

1. Self-assessable development
 - collection of dead marine wood from unallocated tidal lands (MPo1)
 - maintenance of legally built public or private structures (MPo2)
 - maintenance of existing on-farm drains (MPo3)
 - maintenance of existing powerlines and associated infrastructure (MPo4)
 - educational and research purposes or to monitor the effects of impacts from development on marine plants (MPo5)
 - survey and investigation works (MPo5)
 - minor impact works for relevant public and private purposes (MPO6).
2. Code assessable development (assessable against the Fisheries Act)
 - maintenance of existing legal structures not specifically covered by a self-assessable code (i.e. maintenance requirements that cannot be achieved by complying with self-assessable code criteria)
 - collection of dead marine wood on lands other than unallocated state lands*
 - rehabilitation and restoration works on tidal lands*
 - new runnelling works*
 - new public and private development works (not maintenance)*
 - waterway barrier works not covered by a self-assessable code.

* Minor impact works that meet the criteria included in code MPO6 will be self-assessable.

8.1 Education and research activities

Background

The UFHM Research Program has established an integrated approach to address and direct research investigating impacts on fish habitats in urban areas throughout Queensland. For a detailed description of the program and a listing of current projects, *UFHM Research Program 2005–2006 and beyond* is available on the DPI&F website.

Most education and research activities can be undertaken as self-assessable fisheries development under the code for self-assessable development MPo5.

Eligible university students can apply for funding under the **Marine Fish Habitat Scholarships (Honours) Program** to undertake a project linked to one of the UFHM research streams.

Policy

- Approvals are issued for legitimate educational or research activities aimed at promoting and investigating marine fish habitat ecosystem processes, flora and fauna and fisheries values.
- The proposed activity should have direct relevance to fish habitats or fisheries resources, and should link to one of the streams of the DPI&F **Urban Fish Habitat Management (UFHM) Research Program**.

- Outside of the UFHM Research Program, the following activities and associated marine plant disturbances may also be approved:
 - display of appropriate signage to raise public awareness of marine ecosystems and fisheries values
 - construction of wetland boardwalks, specifically designed to provide educational information on fish habitats and fisheries resources
 - proposals specifically designed to increase awareness or knowledge of marine ecosystem processes to enhance or support management of fish habitats and fisheries resources in Queensland.
- Those who may apply to the UFHM Research Program are:
 - recognised educational institutions
 - local governments
 - community groups
 - research institutes
 - government research bodies (e.g. CRCs)
 - university research departments etc.

8.2 Restoration of fish habitat

Background

Restoration projects involving the removal and use of mangrove seeds and propagules and saltmarsh plants, either from non-tidal lands or in accordance with a DPI&F endorsed restoration project plan, will be permitted under the self-assessable code for low-impact new works. Experience in Australian and overseas has demonstrated that the removal of degrading influences and restoration of natural profiles are the most cost effective and biologically successful methods of restoring marine wetlands.

Restrictions may be placed on the amount and timing of collection of propagules or seedlings so as to minimise impacts to source areas. For marine plant species with limited distribution and low seed production, appropriate limits on collection will apply²². For works that do not fit within the self-assessable code for minor works MPo6, an application for a DA will need to be lodged. Where commercial culture of marine plants is to occur, a DA for aquaculture may be required.

Policy

- Approved restoration projects will allow for the natural regeneration of marine plants on tidal lands through the reinstatement of suitable tidal profiles to encourage natural recruitment back to the target area.
- Planting should only be undertaken where it is considered necessary to enhance natural regeneration, and where there is high probability of seedling survival and genetic considerations have been addressed.
- Reference should be made to the fish habitat guidelines for *Restoration of Fish Habitats* (FHG 002) and *Mangrove Nurseries: Construction, Propagation and Planting* (FHG 004).
- Any proposed restoration works must demonstrate benefits to fisheries resources.
- Annual monitoring must continue for a suitable period of time²³—the success of the restoration works must be documented and any issues requiring ameliorative action identified.
- Annual monitoring reports are required to document the progress of the project and build knowledge on this issue.
- Applicants should be persons or organisations with suitable qualifications and experience to undertake the proposed activities, have access rights to the defined site to undertake the activity and be able to submit a project plan to DPI&F for consideration with their application.

²² Appendix 3 provides more information on the status and distribution of mangrove species in Queensland.

²³ The length of time that monitoring is required for is considered on a case-by-case basis.

8.3 Translocation issues for marine plants

Background

To reduce the risk of genetic pollution, marine plant material (including seeds or seedlings) may only be collected within the local area (usually within 100 km of the proposed restoration site). In the case of the grey mangrove (*Avicennia marina*), there is an additional restriction on the collection and use of the two recognised varieties. See Appendix 2 for more information on marine plant translocation issues and the movement of the grey mangrove species in Queensland.

Policy

Translocation of marine plants is not supported. Movement of marine plants within their accepted distribution is supported, providing an assessment is conducted (prior to any proposed movement) to ensure the translocation meets the following conditions:

- The removal of individuals is unlikely to pose an unjustifiable risk to the source population.
- The host area has suitable and sufficient habitat for the survival of the species.
- The species being translocated is likely to have no unjustifiable adverse impact, including the spread of disease or parasites, upon the host area.
- The factors that caused the species decline in the host area have been identified, are being reversed and are unlikely to recur.
- The genetic viability is not compromised at the host area.
- Other potential threats are unlikely to compromise the success of the translocation.
- The translocation satisfies approval requirements under the Fisheries Act.

Restoration projects within a declared FHA are further limited in that the source and host areas must lie within the boundary of that FHA.

8.4 Survey and investigation works

Background

Works for existing property boundary definition, and for survey and investigation of impacts of development on marine plants and other tidal fish habitats, are covered by the self-assessable code MPO5.

Survey and investigation works for access to determine new land profile, reconfiguration of a lot and subdivisions are new development works and are assessed as part of a development application. These types of survey and investigation works are not covered by the self-assessable code.

Policy

- DPI&F supports investigations that are looking to identify proposal location, design or work methods that will result in the smallest impact possible to marine plants and other tidal fish habitats.
- Certain investigations may also be required to assist in the assessment of a DA application.
- Standard scientific methodologies of minimal impact to fish habitats and fisheries resources are supported.
- All tidal wetland profiles and substrate compositions are to be restored following the proposed investigation activities to allow for the natural regeneration of marine plants and other tidal fish habitats.
- Only hand cutting (lopping) of marine plants is permitted and for a maximum line of sight clearance path of 1 metre in width.
- As few marine plants as possible are to be removed, destroyed or damaged (by tying back), through minimal hand cutting only, in accordance with techniques described in the Australian Standard on Pruning Amenity Trees AS4373²⁴.
- All cut marine plants are to be removed by hand from tidal lands.
- Works are to be undertaken by suitably qualified registered surveyors, consultants or researchers.

24 See Standards Australia at www.standards.org.au

8.5 Collection of dead marine wood

Background

Historically, dead marine wood has been collected for hobby use (e.g. wood turning), with limited amounts of dead marine wood traded or sold as artifacts. Collection of dead marine wood is defined as operational works (that is, the disturbance of protected marine plants) and therefore an approval or authority is required for legal collection activities. Dead marine wood plays an important role in the detritus food web and in supporting fisheries production and fish habitat values.

Policy

- Collection of large volumes of dead marine wood for the aquarium trade or for any other purpose is not supported.
- No collection is allowed within declared FHAs.
- An RAA for USL must be obtained for the collection area prior to any collecting activities.
- The number of dead marine wood collectors per area is restricted to ensure minimal impact to fisheries resources and avoid overlap of RAAs.
- All dead marine wood collection from USL is to be undertaken in accordance with criteria set out in the self-assessable code for the collection of dead marine wood on unallocated tidal lands (MPo1):
 - No more than 50 pieces of dead marine wood may be collected per calendar month.
 - A maximum of 100 pieces may be held in possession of an authorised person at any time.
 - The length of each piece of dead marine wood is to be no longer than 1 metre.
 - No piece over 1 metre is to be cut or broken to achieve size restrictions.
 - Standing dead marine wood with remnant root system is to be left in the ground, and not taken or pushed, to minimise substrate disturbance.
 - All collections will be by hand and all material collected will be carried by hand from the tidal land.
 - Access to and from the tidal land is to be by foot only.
 - No vehicles, machinery or tools will be used on tidal lands.
 - At the point of sale of a dead marine wood item, the seller is to display the number and title of the self-assessable code.
 - Collection of dead marine wood from lands other than USL may be covered by MPo6, which has similar constraints as MPo1.

8.6 Private development works

Background

DPI&F recognises the rights of certain land owners with a legitimate expectation to be able to access tidal lands to build and maintain facilities for private use. The construction of private fences and some forms of private maritime infrastructure (e.g. jetties, pontoons and mooring piles) that involves marine plant disturbance may be permitted under the self-assessable code for minor impact works MPo6.

Private development works also includes the commercial production and sale of marine plants for bioremediation. This activity currently requires an aquaculture development approval; however, the removal of algae by hand for use in aquaria filtration systems is allowed under the code for self-assessable development MPo6.

The following policy statements are applicable to proponents seeking approval for private development works:

Policy

- Granting of tenure over tidal fish habitats is not supported, as these habitats are a community resource.
- Any non-minor permanent impacts to marine plants or other tidal fish habitats identified must be off-set by the proponent²⁵.
- All private development works must be set back from tidal lands and fish habitats, except for those parts that have an overriding requirement to be placed on tidal lands. The guidelines for *Fish Habitat Buffer Zones* (FHG 003)²⁶ provide DPI&F policy on setback widths and maintenance of buffer functions.
- Additional disturbance for access paths, including dredging navigation channels, is not supported. Alternative design or location and prevailing coastal processes (e.g. sedimentation) must be considered.
- The long-term operability and impact of the use of the proposed structure must be considered. For a private jetty application, for example, the applicant must demonstrate that they will not need to dredge navigation access to the proposed jetty in the future.
- For jetty, pontoon and boardwalk construction, the issue of shading should be addressed. Materials should be used that will allow a minimum 40% light penetration on all surfaces located over fish habitats. This requirement is a relevant condition on certain DAs.
- For jetty and pontoon²⁷ construction, the maximum allowable disturbance is a 15 metre by 2 metre length (measured perpendicular to the shore) of fringing marine plants (30 square metres).
- For maintenance (e.g. replacing decking) of existing structures on tidal fish habitats, all decking surfaces should allow a minimum of 40% light penetration.
- Applicants must demonstrate rights to access the area and undertake the proposed works (a properly made application will have resource entitlement or owners consent, which will demonstrate rights). Such rights include:
 - (i) Applicant has been granted tenure over the area of works.
 - (ii) For jetties or boat ramps: applicant has tenure over the works area or has tenure over the area immediately adjoining the area of works and has full riparian access rights.
 - (iii) For drainage works: the applicant has tenure over the area immediately adjoining the area of works.
 - (iv) For revetment works: the applicant has tenure over the area immediately adjoining the area of works, accelerated erosion (i.e. not the natural rate) is present and the works will be fully undertaken within the tenured boundary above the Highest Astronomical Tide (HAT).
 - (v) For aquaculture inlet and outlet structures²⁸, applicant has tenure of the area immediately adjoining the area of works and will undertake restoration of tidal profiles.

8.7 Surveyed and unsurveyed natural boundaries of freehold riparian properties

The onus is on the property owner to provide evidence of existing property boundaries through provision of a copy of a registered survey plan. NRW should be consulted for information regarding property boundaries and tenure issues.

Currently, NRW has a temporary stay²⁹ (to November 2008) on the registration of plans of tidal boundaries, which took effect on 8 November 2005. It affects certain plans of subdivision, including plans of resurvey. It also affects landowners who have a boundary that abuts tidal parts of rivers and the coast who wish to resurvey this tidal boundary.

25 DPI&F is revising operational policy FHMOP 005 for mitigation & compensation for fish habitat loss. Contact DPI&F on 13 25 23 for further advice on current offsets policy.

26 Available on the DPI&F website at www.dpi.qld.gov.au or by contacting DPI&F on 13 25 23.

27 See glossary for definition of pontoon. Note that the floating unit is not usually considered part of the application if these do not disturb marine plants.

28 Existing inlet or outlet structures and farm drains can be maintained under self-assessable code MP03 for on-farm drain maintenance works involving the removal, destruction or damage of marine plants.

29 Visit the NRW website for more information on property boundaries and surveys: www.nrw.qld.gov.au/property/amendment.html

8.8 Public (community benefit) development works

Background

Community benefit works are generally those facilities for public use that contribute to access and use of fish habitats and fisheries resources through the provision of an appropriate structure (e.g. public boat ramps, boardwalks, pontoons, fishing platforms, ferry terminals).

For the construction and maintenance works of the proposed facility, standard conditions apply (as well as any site-specific conditions required to manage impacts on marine plants and other tidal fish habitats) if the works are outside the criteria of self-assessable code MPo2.

Some low-impact new works for public health and safety, such as runnels for mosquito control and toxic algae beach cleaning operations, are covered under self-assessable code MPo6.

Policy

- All impacts must be fully justified with any permanent residual loss of fish habitat to be offset.
- Loss of marine plants or other tidal fish habitats to accommodate flood management issues caused by inappropriate development in floodplains is not supported.
- Channelisation and concrete lining of natural waterways for drainage purposes are not supported.
- Car parks, offices, restrooms and other associated facilities are not to be placed on fish habitats.
- Applicants should be a local government, state or federal agency or statutory body or (if facility is constructed privately) there should be an agreement to hand over control and maintenance of the facility to one of the above.
- For jetty, pontoon and boardwalk construction, the issue of shading should be addressed. Materials should be used that will allow a minimum 40% light penetration on all surfaces located over fish habitats.

8.9 Prescribed development and significant projects under the *State Development and Public Works Organisation Act 1971*

Significant projects or prescribed projects under the *State Development and Public Works Organisation Act 1971* may require public notification and need an environmental impact assessment study and/or EIS to be prepared for the CoG. For these projects, the assessment and decision-making powers reside with the CoG.

The policy principles should be followed within the scope of DPI&F's field of influence, such as in providing comments on the project and recommendations to the decision maker.

For prescribed projects, the CoG may issue a decision maker with a 'progression notice' (i.e. to complete an administrative process within a specified timeframe), a 'notice to decide' (i.e. make a decision on an approval within a specified timeframe), and/or a 'step in notice'. In the latter case, the CoG takes over the assessment and decision making process, while the original decision maker is required to provide assistance. In these circumstances, any advice or assistance from DPI&F should be based on the intent of the Fisheries Act and the provisions of this and any other relevant fish habitat management policies.

Major developments may also be 'impact assessable' under the IPA or a local government planning scheme.

Under section 3.2.2A of the IPA, any application for a material change of use or reconfiguration of a lot on tidal lands must have an approval or include an application for operational works for the disturbance of marine plants, even though the operational works may take place at a later stage. The operation of section 3.2.2.A of the IPA may result in DPI&F not being a concurrence agency, and an operational works approval for marine plant disturbance may not be required. DPI&F should be involved in the EIS process, however, and recommend relevant conditions to be included in the CoG report.

8.10 Urban Mangrove Management Strategies

Background

Previously, a development approval was required to implement local government Urban Mangrove Management Strategies (UMMS) and associated site-based operational plans. However, actions within agreed UMMS are now self-assessable under the code MPO6 for self-assessable development for minor impact works.

Each UMMS is based around a set of agreed categories or treatments for each identified section of foreshore within the local government area. These categories are:

- Protect mangroves—areas where existing marine plant communities are maintained and natural processes, such as further colonisation and marine plant community development, are allowed to occur. These areas benefit from being linked to terrestrial vegetated buffers to provide long-term protection.
- Restore mangroves—areas where opportunities to enhance existing marine plant communities exist and actions may be taken to reduce or remove threatening processes to support natural regeneration.
- Mangrove-free—existing mangrove-free areas are maintained in that treatment of the bank and maintenance activities need not specifically allow for colonisation of marine plants.
- Multiple use (mangrove modification)—areas where impacts to marine plants are minimised while meeting specific public use requirements and may include treatments that remove or modify marine plants. A site-based operational plan will identify the most appropriate treatments (e.g. crown lifting, trimming, thinning or replacement of taller varieties with smaller or lower-growing forms).

Benefits of this management approach include:

- productive collaboration between state and local governments
- agreed management strategies that balance competing and diverse demands
- capacity to attract funds for strategy development and implementation
- integration with other council planning instruments
- key mangrove communities retained and shared understanding of roles of these marine plants as foreshore assets
- adjacent foreshore development alerted to constraints and agreed treatment of river banks
- sites identified for restoration
- reduced approvals and rationalised bureaucracy
- enhanced achievement of public expectations
- works program certainty for councils
- enhanced budget planning and management
- innovative best-management practices supported
- collaborative monitoring and data exchange.

Policy

- Where appropriate, UMMS will be developed with coastal local governments³⁰ for foreshores of particular estuarine waterways within their jurisdiction.
- UMMS will provide management direction for agreed foreshore sections and outline a suite of activities and practices for the management of urban mangrove communities.
- To support operational management requirements, site-based management plans are developed to provide higher resolution for the management categories applicable for a nominated period.

³⁰ See Appendix 4 of this document for the protocol for developing UMMS with local government.

9. Works not supported

Some works and activities are not supported by DPI&F due to unacceptable impacts on marine plants and other tidal fish habitats, incompatibility with objectives of the Fisheries Act and/or other fisheries policies, or because other alternatives, which avoid or minimise impacts, exist. All unlawful disturbances to marine plants are to be directed to the QBFP for investigation.

9.1 Unauthorised disturbance of marine plants

Unauthorised disturbance of marine plants, unless for emergency purposes, is unacceptable. All unauthorised disturbances to protected marine plants should be directed to the QBFP for investigation, as appropriate.

Fisheries RAAs and DAs are not issued retrospectively for unauthorised disturbances to marine plants. See section 10.10 of this document for advice on the IPA and approvals for unauthorised development.

9.2 Filling of tidal lands for non-marine dependent development

Filling of tidal lands results in permanent and irreversible loss of marine plants, other tidal fish habitats, fisheries productivity and fisheries resources, and may negatively impact fishing operations. Alternatives of lesser impact exist (e.g. resumption of adjacent housing for boat ramp car park, amendment of lot reconfiguration to avoid tidal lands and other tidal fish habitats).

Certain works to regularise the shoreline for erosion control may be considered.³¹

9.3 Private aesthetic and view purposes

Aesthetic and view benefits reflect individual preferences and circumstances. These preferences are often conflicting between individuals. The removal, destruction or disturbance of marine plants or other tidal fish habitats for aesthetics and views represent unacceptable community impacts relative to the individual private benefit. Cumulative impacts (such as the loss of marine plant communities and associated productivity in areas where residential estates abut tidal communities) lead to loss of fish habitats and fisheries resources.

The removal, destruction or damage of marine plants for private aesthetic purposes is not supported.

9.4 Use of tidal lands for non-marine dependent purposes

The coastline and intertidal areas are a finite resource under considerable development pressure from conflicting uses. Priority must be given to uses that depend on their location in or on tidal land, e.g. boat ramps, jetties harbours, marinas. The uses described below are not considered to be acceptable uses as alternatives of lesser impact will exist (e.g. resumption of adjacent terrestrial land for boat ramp car park). No overriding requirement to impact upon tidal lands exists to justify the specific impacts. The long-term management of fish habitats and fisheries resources must restrict any access or use of tidal lands only to those with a legitimate requirement to impact.

Developments not supported for location on tidal lands include:

- marina office or amenity facilities
- car park areas including for boat ramps
- bird hides, private walkways, etc.
- parks, residential, industrial, pond aquaculture and agriculture development
- restaurant, hotel, supermarket, car park, bikeway construction
- golf course development
- sewage effluent treatment works
- sports fields.

Certain works to allow for the construction of emergency facilities for remote communities where no alternative exist may be considered.

³¹ For DPI&F policy on erosion control, see the Fish Habitat Management Operational Policy *Tidal Fish Habitats, Erosion Control and Beach Replenishment* (FHMOP 010).

9.5 Private trimming

Trimming of marine plants by private landowners is not supported. However, the owner of a lawful structure may be able to undertake trimming for maintenance of that structure under a self-assessable code.

9.6 Works where rights cannot be demonstrated

An example of works where rights cannot be demonstrated would be where a private jetty has been built coming from a park, esplanade or unallocated state lands. The impacts cannot be justified as the jetty builder has no rights to access public lands for a private purpose.

Rights are necessary to ensure:

- fair access
- ecologically sustainable use of resources
- optimal community and economic benefits.

9.7 Works where alternatives of lesser impact exist

Works are not supported where there are alternative designs, methods or locations available that have lesser impact on marine plants or other tidal fish habitats. Examples of works where alternatives of lesser impact exist are:

- building a causeway across a waterway (when a piled bridge could be used instead)
- filling tidal lands for a car park when terrestrial lands could be used instead.

The benefits sought may still be obtained by adoption of the alternatives, and therefore there is no ability to justify the impacts.

Unnecessary impacts are not compatible with ensuring:

- fair access
- ecological sustainable development
- optimal community and economic benefits.

9.8 Works where benefits to the community do not justify the impacts

Applications will not be supported where the impacts to marine plants and other tidal fish habitats or fisheries resources outweighs the stated community benefits of the proposal.

Unnecessary impacts are not compatible with ensuring:

- fair access
- ecologically sustainable use of resources
- optimal community and economic benefits.

9.9 Odour reduction purposes

Decaying marine plant seeds, leaves and wracks produce odours as part of the natural cycle. Removal from the natural environment represents unacceptable impacts to the fisheries food chain relative to private or community interests. Exception is made for approval for the removal of toxic and nuisance algae (e.g. *Hincksia* and *Lyngbya* species) by local governments for public health and safety reasons.

9.10 Aquaculture pond construction below the highest astronomical tide

Pond construction below HAT can cause permanent, irreversible and total loss of marine plants, other tidal fish habitats and fisheries resources. Alternatives of lesser impact exist. Lands below HAT characteristically consist of acid sulfate soils. Any disturbance of these lands will result in impacts onsite and to adjacent waterways.

9.11 Habitat modification

All marine fish habitats are valuable—they provide a mosaic of habitat diversity for aquatic species to be able to complete their life cycles. The impacts of substituting one habitat for another create an unacceptable level of risk that can not be fully mitigated and is not easily reversed. The precautionary principle advocates dealing cautiously with risk. Examples of habitat modification would be wader bird roosts, the creation of sandy beaches for amenity or the creation of mangrove lands from other tidal fish habitats.

9.12 Beach replenishment (erosion protection)

All beach replenishment and artificial beach creation outside the scope of the Fish Habitat Management Operational Policy *Fish Habitats, Erosion Control and Beach Replenishment* (FHMOP 010) is not supported.

Impacts include an initial and ongoing loss of existing benthos from and alteration of habitats in both nourishment and source areas as well as ongoing interference in natural processes and subsequent impacts. Impacts are not easily reversed and will persist in the environment. Alternatives of lesser impact usually exist.

9.13 Dredged spoil disposal on tidal lands

Disposal of dredge spoil on tidal lands causes an initial and ongoing loss of existing benthos from and alteration of habitats in the disposal area as well as ongoing interference in natural processes and subsequent impacts. Alternatives of lesser impact exist. See Fish Habitat Management Operational Policy *Dredging, Extraction and Spoil Disposal Activities* (FHMOP 004). See also, the EPA operational policies for ERA 19 (dredging).

9.14 Dredging of tidal lands to gain access to private facilities

Dredging for access to private facilities is not supported. A level of impact for specific structures has been set (see sections 9.18 and 9.19 of this policy) as acceptable for the development of private jetties or boat ramps by property holders abutting estuarine and coastal areas.

9.15 Alteration of natural waterways for drainage purposes

Storm and floodwater drainage should not conflict with, replace or alter the natural system. Alteration of natural waterways results in ongoing interference in natural processes. Alternatives of lesser impact exist.

9.16 Permanent causeway construction on tidal lands

Causeways may result in permanent, irreversible loss of marine plants, other tidal fish habitats, fisheries productivity and fisheries resources and alteration to tidal inundation and drainage patterns. Alternatives of lesser impact will exist (e.g. bridge).

9.17 Herbicide spraying or burning of marine plants

Herbicide spraying or burning of marine plants or other tidal fish habitats results in higher than acceptable levels of impact that may persist in the environment for an unknown period. There may also be long-term detrimental effects on fish habitats and fisheries resources.

9.18 Private jetties and pontoons

Applications for private jetties and pontoons³² are deemed to have too high a level of impact if they disturb more than the maximum area of 15 metres by 2 metres in length (measured perpendicular to the shore) of fringing marine plants (30 square metres).

This level of impact has been set as acceptable as the reasonable expectation of property holders abutting estuarine and coastal areas to gain or maintain access to private jetties. This level of impact does not extend to excessive jetties, ramps or dredging of access to a property.

9.19 Private boat ramps

Applications for private boat ramps with an area of 45 square metres or greater of marine plant disturbance are deemed to have too high a level of impact. DPI&F's position is to encourage use of public boat ramps.

9.20 Revetment works

Revetment works are not supported where there is no substantiated accelerated (i.e. not the natural rate) bank erosion or slumping threatening buildings or infrastructure present (refer to section 8.6 [iv] for private revetment works). This is an aesthetic issue if there is no need to protect infrastructure. Aesthetic benefits reflect individual preferences and circumstances. These are often conflicting preferences between individuals. Aesthetic disturbances represent unacceptable impacts relative to the individual private benefits.

9.21 Large scale collection of dead marine wood

Fish habitat resources are not able to support high levels of dead marine wood collection without negative impacts. Dead mangrove timber and root structures are important as these provide structural habitat and nutrients for dependant fisheries resources. Only the levels of collection authorised in the self-assessable code MPo1 are supported.

9.22 Commercial collection of seagrass and macroalgae

Fish habitat resources are not able to support high levels of seagrass and macroalgae (dead or live) collection. These marine plants are an integral part of marine fish habitats and contribute directly to the sustainability of fish stocks. Only the levels of collection authorised in self-assessable codes MPo5 and MPo6 are supported.

The commercial production and sale of macroalgae for bioremediation purposes may be considered for approval. Where commercial culture of marine plants is to occur, a DA for aquaculture may be required.

³² See glossary for definition of pontoon. Note that the floating unit is not usually considered as part of the application, if these do not disturb marine plants.

10. Additional advice and information

The following sections provide additional advice and information on related issues for marine plant and other fish habitat protection and management.

10.1 Application of ‘adjacent’ definition

The Fisheries Act recognises ‘fisheries resources’ as the critical management unit that sustains fisheries productivity. ‘Fisheries resources’ are defined as including fish and marine plants. This recognises a direct link between fisheries productivity and marine plant species; that is, marine plants of direct and indirect value to fisheries are those that support fisheries production. Protected marine plants are described as those plants usually growing on or adjacent to tidal land.

Fisheries Tribunal decision relating to ‘marine plant’ definition

A Fisheries Tribunal decision has concluded that even though an assessment may state some marine plants on-site are above ‘functional’ HAT and not tidally connected, and of little value to fisheries production, in applying the Fisheries Act the decision maker must ensure the approval includes ALL marine plants to be removed from the site.

Key points from the tribunal decision were:

- All land below the theoretical level of HAT is tidal land.
- Redrawing HAT for a particular site based on vegetation characteristics is not sufficient.
- The definition of marine plant means that a decision must first be made about whether the land is tidal land.
- It is an error of law to decide whether land is tidal (or not) by the presence (or absence) of marine plants.

The question of what constitutes ‘adjacent’ has become a key issue in investigating whether certain plants are captured in the definition of marine plants and to what extent their loss might affect fisheries production. The Fisheries Act does not define ‘adjacent’ as it relates to marine plants. In the absence of a definition, this policy describes the application of ‘adjacent’ in terms of when a marine plant development permit application would be required for disturbance of plants in or adjacent to the tidal zone.

High fisheries significance plants are plants that usually grow on or **adjacent** to tidal land (that have a capacity for connectivity, for example, via seasonal flows during the wet season) and are known to contribute to fisheries productivity. Plants that usually grow on tidal lands include all true mangroves, seagrasses, marine algae, saltcouch and samphires. These types of plants would normally occur where there is some tidal influence. These are protected marine plants regardless of their location and whether or not they are on tidal lands.

Plants that usually grow **adjacent** to tidal lands include *Melaleuca* and *Casuarina* species. These plants are of value to fisheries productivity. In particular, where *Melaleuca* swamps adjacent to tidal areas are either permanently or periodically tidally connected and where *Casuarina* stands on the landward edge of tidal flats have saltcouch or samphire communities growing underneath them.

A fisheries development approval application **is required** for any disturbance of high fisheries significance plants.

Low fisheries significance plants: for practical purposes, the term marine plant does not include other plants that grow geographically adjacent to tidal land and which are **not** considered or not known (on current knowledge) to contribute to fisheries productivity. Low fisheries significance plants generally include non-tidal, terrestrial plants, whole or part, such as river gums, terrestrial grasses and palm trees.

A fisheries development approval application **is not required** for any disturbance of low fisheries significance plants.

Note that each tidal vegetation community varies in species composition. In certain circumstances, a particular species may dominate (e.g. *Hibiscus*) and may therefore play a greater role in fisheries production. This may lead to that species being considered as a plant of higher fisheries significance.

Marine plants, such as saltcouch, that grow above HAT and are isolated from tidal inundation do fall within the ‘marine plant’ definition. They need to form part of a fisheries development approval, despite having a low fisheries significance.

10.2 Algae

Algae include macroscopic and microscopic species of marine plants found within the water column and sediments of tidal fish habitats, such as mudflats, sandflats, salt marshes, tidal marshes and estuaries. Algae are extremely important for primary production, supporting the coastal food chain and constituting a major food source for important forage and fisheries species.

Although algae are included in the definition of marine plants, there are practical difficulties in their identification and estimates of abundance. A number of activities such as dredging, filling of tidal lands and extractive industries do impact on algal populations. These impacts could lead to reduced local and regional fisheries production. Where there is readily available evidence of algae, DPI&F will be a concurrence agency and exercise its ability to require an approval for disturbance of these.

10.3 Buffer Zones

The role of buffer zones in sustaining fisheries resources through maintaining connectivity between coastal and riparian vegetation and estuarine and freshwater reaches of catchments is separate, but linked to the statutory protection afforded to marine plants.

The Fisheries Act provides the ability to condition an approval to provide for buffer zones between the development and fisheries resources (see section 76L, 2a). DPI&F has adopted a generic policy position that recommends a minimum buffer width of 100 m (natural vegetation) set back from the level of HAT in tidal areas (especially adjacent to declared FHAs) and a minimum 50 m (natural vegetation) set back from freshwater areas. It is recognised that site-specific requirements will determine the size of buffers that can be implemented. The fisheries guidelines for *Fish Habitat Buffer Zones* (FHG 003) have been developed to provide guidance on fish habitat buffer zone functions, widths and maintenance to assessment officers and applicants for development approvals.

Appropriate buffer provisions should be accommodated within the site for protection of fisheries resources, and may require enhancement where habitat degradation is significant.

10.4 Acid sulfate soils

Acid sulfate soils (ASS) occur naturally over extensive areas of low-lying coastal lands, predominately below 5 metres AHD. In Queensland, ASS cover approximately 2.3 million hectares, and the presence of these soils affects urban, transport, tourism, agricultural and industrial land uses. ASS are exposed to oxygen through works, such as excavation and drainage, resulting in the production of sulphuric acid and toxic metals. The acid corrodes concrete and steel infrastructure, and together with the metal toxins can kill fish, other aquatic life, native vegetation and crops.

The State Planning Policy 2/02 *Planning and Managing Development Involving Acid Sulfate Soils* requires local governments to ensure that development applications address ASS issues. The presence of marine plants is an accepted indicator for the presence of ASS and should be included as a layer in local government development constraints mapping. ASS risk maps are available for a number of areas in Queensland at varying scales through NRW.

10.5 Assessment of applications during breach proceedings

If a development application is received while the applicant is under investigation for a breach of the Fisheries Act, it must still be assessed. The breach investigation process is separate from the assessment process. DPI&F will continue the assessment process even if the applicant is currently under a breach investigation. Application of DPI&F policies should not undermine the Magistrate's decision or breach investigation process. DPI&F may issue a restoration or an enforcement notice for the unauthorised works.

10.6 Disposal of seized dead marine plants

Seized dead marine plants no longer required for breach proceedings are to be returned to the tidal environment. Sale of seized dead marine plants is not supported, as this would set an untenable precedent for giving these a commercial value. Where seized dead marine plants exceed the minor quantities collected as evidence, advice is to be sought from the Principal Scientist, Marine Habitat DPI&F for appropriate disposal.

10.7 Emergency provisions

Section 76V of the Fisheries Act and section 4.3.6 of the IPA provide for emergency fisheries development to be carried out that may remove, damage or destroy marine plants, provided that the chief executive (or delegated officer) is satisfied that the marine plant is a danger to public health and safety. In this situation, an approval is not required.

Section 4.3.6 of the IPA requires that the person carrying out the emergency works is to provide a written notice to the assessing authority (DPI&F) as soon as practicable after starting the development or use. DPI&F requires that for emergency fisheries development involving the removal, destruction or damage of marine plants, the written notice (detailing works and remedial actions undertaken) must be forwarded to DPI&F within 5 business days after works are completed.

Wherever possible, prior to undertaking the emergency works, the local Queensland Boating and Fisheries Patrol office or Manager (Planning and Assessment) of the relevant regional Fisheries office should be contacted for agreement on the nature and extent of the disturbance to marine plants required to overcome the emergency situation.

10.8 Restoration Notices

When a Restoration Notice is issued under sections 124 and 125 of the Fisheries Act, it contains a set of instructions, detailing restoration actions to be carried out. A fisheries DA to undertake the directed works is not required. However, other works (such as collection of seed from outside the restoration area) require a DA and may also require other natural resource management agency approvals (e.g. resource entitlement). Whenever possible and appropriate, a court-ordered restoration should be sought for the reversal of impacts caused by unlawful disturbances to protected marine plants and fish habitats.

10.9 Enforcement Notices

An Enforcement Notice may be issued by the assessing authority under section 4.3.11 of the IPA for carrying out development without a permit or for not complying with applicable self-assessable codes. An enforcement notice may require a person committing an offence to stop the activity and restore the site to the condition it was in immediately prior to the unlawful development commencing. Failure to comply with an enforcement notice may result in penalties up to a maximum of 1 665 penalty units or \$124 875.

10.10 Integrated Planning Act approvals for unauthorised disturbance of marine plants

Under the IPA, an applicant may lodge an application for development that has already commenced without a DA. DPI&F may receive an application for a fisheries DA for unauthorised disturbances to marine plants where a proponent:

- has been issued an Enforcement Notice under the IPA that requires an application for a fisheries DA to be made or
- decides to lodge an application for a fisheries DA for previous unauthorised disturbance to marine plants, often triggered by a QBFP investigation.

A proponent may wish to lodge an application for prior unauthorised disturbance of marine plants associated with an unlawful existing structure to 'legalise' the structure.

If an application is lodged, DPI&F will assess the application for unlawful disturbance of marine plants previously carried out, on a case-by-case basis against relevant fisheries policies, taking into consideration any unauthorised works or activity. Note that section 10.5 of this policy also applies.

If appropriate, approval may be issued to authorise the works but only from the date of that decision. The approval does not erase the fact a development offence has been committed. A decision to refuse and a requirement for restoration under the provisions of the Fisheries Act or the IPA may also be made.

11. References and further reading

Fish habitat operational policies

FHMOP 002 Derbyshire, K, McKinnon, S & Sheppard R 2007, *Management of declared Fish Habitat Areas: Departmental policy position*, Queensland Department of Primary Industries and Fisheries, Fish Habitat Management Operational Policy, 108pp.

FHMOP 003 White, M and Beumer, J 1996 (in revision) *Departmental Procedures for Permit Applications Assessments and Approvals for Insect Pest Control in Coastal Wetlands*, Queensland Department of Primary Industries, Fish Habitat Management Operational Policy.

FHMOP 004 Hopkins, E and White, M 1998 (in revision) *Dredging, Extraction and Spoil Disposal Activities: Departmental Procedures for Provision of Fisheries Comments*, Queensland Department of Primary Industries, Fish Habitat Management Operational Policy.

FHMOP 005 Dixon, M and Beumer, J 2002 (in revision) *On-site Mitigation and Off-site Compensation for Activities Causing Marine Fish Habitat Loss: Departmental Procedures*, Queensland Department of Primary Industries, Fish Habitat Management Operational Policy.

FHMOP 006 McKinnon, S and Sheppard, R 2001 *Fish Habitat Area Declaration and Review: Departmental Consultation Procedures*, Queensland Department of Primary Industries, Fish Habitat Management Operational Policy, 27 pp.

FHMOP 007 McKinnon, S, Sheppard, R and Beumer, J 2003 *Fish Habitat Area Selection and Assessment: Departmental Procedures*, Queensland Department of Primary Industries, Fish Habitat Management Operational Policy, 22 pp.

FHMOP 008 Peterken, C 2001 *Departmental Procedures for Permit Applications Assessment and Approvals for Water Way Barrier Works*, Queensland Department of Primary Industries, Fish Habitat Management Operational Policy, 48 pp.

FHMOP 009 Mackenzie, J and Dixon, M 2002 *Restoration Notices for Fish Habitats—Formulation and Implementation: Departmental Procedures*, Queensland Department of Primary Industries, Fish Habitat Management Operational Policy, 49 pp.

FHMOP 010 Batton, R 2007 *Tidal fish habitats, erosion control and beach replenishment*, Queensland Department of Primary Industries and Fisheries, Fish Habitat Management Operational Policy, 38 pp.

Fish habitat guidelines

FHG 001 Cotterell, EJ 1998 *Fish Passage in Streams: Fisheries Guidelines for Design of Stream Crossings*, Queensland Department of Primary Industries, 37 pp.

FHG 002 Hopkins, E, White, M and Clarke, A 1998 *Restoration of Fish Habitats: Fisheries Guidelines for Marine Areas*, Queensland Department of Primary Industries, 44 pp.

FHG 003 Bavins, M, Couchman, D and Beumer, J 2000 *Fish Habitat Buffer Zones: Fisheries Guidelines*, Queensland Department of Primary Industries, 39 pp.

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FHG 005 Challen, S & Long, P 2004, *Fisheries guidelines for managing ponded pastures*, Queensland Department of Primary Industries and Fisheries, 27pp.

FHG 006 Derbyshire, K 2006, *Fisheries guidelines for fish-friendly structures*, Queensland Department of Primary Industries and Fisheries, 65pp.

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Bruinsma, C 2000 *Queensland Coastal Wetland Resources: Sand Bay to Keppel Bay*, Department of Primary Industries, Queensland.

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Environmental Protection Agency (EPA) wetland management profiles

Detailed profiles on Queensland's wetlands including saltmarshes and mangroves:

Wetland management profiles—an overview	Great Artesian Basin spring wetlands profile snapshot
Great Artesian Basin spring wetlands	Coastal melaleuca swamp wetlands
Coastal wet heath/sedgeland wetlands	Saltmarsh wetlands
Coastal grass-sedge wetlands	Arid zone lakes
Karst wetlands	Crater lakes
Mangrove wetlands	Arid-zone swamp wetlands
Inland non-arid swamp wetlands	Coastal dune lakes
Inland non-arid lakes	Palm swamp wetlands

www.epa.qld.gov.au/nature_conservation/habitats/wetlands/wetland_management_profiles/

Appendix 1

Queensland fisheries resources: timing of biological events

Information prepared in this appendix has been taken from Version 1 1999 of the information document Queensland Fisheries Resources: Timing of Biological Events and DPI&F's fish habitat guidelines *Fish passage in streams* (FHG 001) and *Restoration of fish habitats* (FHG 002).

Spawning and migration periods for selected Queensland fish species

As a guide, where authorised works in tidal areas are proposed, these should be scheduled to minimise disturbance of habitats on which aquatic species depend. In this regard, autumn and winter months may be considered in preference to other times of the year, based on known spawning and migration times of key species. Investigations of the optimal period for works to maintain drainage waterways in northern Queensland indicate that works should target post-wet periods (autumn) and that pre-wet times (winter) should be avoided, based on fish use of waterways (Clarke et al, 1996). Tables 1 and 2 indicate generalised times of movement for selected species, including movement of juvenile fish and prawns, and are provided as a guide only.

Information about **flowering and fruiting times for Queensland marine plant species** is provided in Tables 3 to 5 as a guide only.

DPI&F staff should be contacted for further information to identify the local and regional importance of fish species and related habitats in regard of specific movement times.

Table 1. Summary movement times for selected marine fish.

Adapted from Hopkins et al. 1998 (Sources: Kerby and Brown 1994; Morton 1985; Pollock 1982; QDPI 1997)

Species	Spawning Period	Comments
Barramundi (<i>Lates calcarifer</i>)	South Qld: December–February Northern Gulf/Far NE coast: October Rockhampton: March–April	Spawn in estuaries and coastal foreshores. Timing/location of spawning dependent on temperature and salinity. See Table 2 also.
Blue salmon (<i>Eleutheronema tetradactylum</i>)	South Qld: August–May Gulf of Carpentaria: July–October	Inshore spawning when salinities rise after wet season flooding. Juveniles move to lower estuaries, tidal swamps and lagoons and shallows along foreshores.
Dusky flathead (<i>Platycephalus fuscus</i>)	Generalised: September–March South Qld: September–February (peak Sept/Oct)	Spawn near estuary bars. Adults and juveniles dependent on estuarine and inshore coastal habitat.
Golden-lined whiting (<i>Sillago analis</i>)	Generalised: September–March North Qld: July–March	Spawn near bar areas adjacent estuary mouths. Juveniles and adults in mud-sandy substrates adjacent mangrove habitats (shallow water).
Grey (broad-barred) mackerel (<i>Scomberomorus semifasciatus</i>)	October–January	Spawn along entire Queensland coast. Evidence suggests larvae and juveniles are dependent on estuarine and coastal nursery habitats.
Grunter (<i>Pomadasys kaakan</i>)	North Qld: April/May Gulf of Carpentaria: July–November	Spawn in nearshore waters with high salinities prior to onset of wet season. Juveniles occupy mangrove and wet season swamps and tidal creeks around estuary margins.
King salmon (<i>Polydactylus sheridani</i>)	South Qld: October–March North Qld: August–March	Offshore spawning. Juveniles in shallow inshore habitats.
Narrow-barred spanish mackerel (<i>Scomberomorus commerson</i>)	East coast: October–November North east coast: August Gulf of Carpentaria: August–February	At least two distinct genetic populations. East coast population spawn near Ingham. Juveniles highly dependent on estuaries and foreshores as nursery and feeding areas.

Species	Spawning Period	Comments
Pearl perch (<i>Glaucosoma</i> spp.)	Unknown	Spawning location unknown. Juvenile habitat is unknown but entire lifecycle is in oceanic waters.
Sand (Summer) whiting (<i>Sillago ciliata</i>)	September–February/March	Spawn near bar areas adjacent estuary mouths. Juveniles prefer shallow water in rivers and creeks over seagrass beds, and in mangroves. Adults move from these habitats to deeper waters as they grow.
School mackerel (<i>Scomberomorus queenslandicus</i>)	South Qld: October–January North Qld: September - January	Spawn in coastal waters along entire Queensland coast. Evidence suggests larvae and juveniles are dependent on estuarine and coastal nursery habitats
Sea mullet (<i>Mugil cephalus</i>)	Generalised: June–August North Qld: May–July	Location of spawning sites unknown, inshore, shallow water species, juveniles enter estuaries at the end of winter, and move to brackish and fresh waters. See Table 2 also.
Snapper (<i>Pagrus auratus</i>)	June–August	Spawn adjacent to deep offshore reefs. Juveniles are abundant in seagrass beds and are also associated with reef and gravel areas.
Spotted mackerel (<i>Scomberomorus munroi</i>)	August–October	Spawn in coastal waters of northern Queensland. Continental shelf pelagic schooling species (juveniles and adults)
Stout whiting (<i>Sillago robusta</i>)	December–February (peak)	Adults on sandy substrates. Juveniles in inshore shallows adjacent surf beaches.
Swallow tail dart (<i>Trachinotus botla</i>)	Generalised: December–February North Qld: November–March	Spawn in semi-surf zones and ocean beaches. Juveniles and adults found on ocean beaches.
Tailor (<i>Pomatomus saltatrix</i>)	Late winter–spring	North Fraser Island: major spawning site in August–October. Spawning concentrated near headlands. Juveniles enter estuaries.
Trumpeter (winter) whiting (<i>Sillago maculata</i>)	July–February/March; peak in September–October Moreton Bay: July–February (peak in winter)	Spawn in estuaries. Juveniles abundant in estuaries and shallow waters, especially seagrass beds in summer.
Yellow finned bream (<i>Acanthopagrus australis</i>)	Generalised: May–August North Qld: May–September	Spawns in estuaries and coastal inshore waters and bars. Juveniles in areas associated with seagrass and mangroves in estuaries.

Table 2. Summary of movement times for selected penaeid prawns.
Adapted from Hopkins and White, 1998 (Source: DPI&F 1997).

Species	Spawning Period	Comments
Banana prawn (<i>Penaeus merguensis</i>)	Late autumn–early spring	Juveniles use sheltered mangrove lined creeks as nursery areas November to May, and emigrate to near-shore coastal areas in summer and autumn months; in southern limits, may overwinter in estuaries.
Brown tiger prawn (<i>Penaeus esculentus</i>)	Summer	Prefer seagrass habitats.
Eastern king prawn (<i>Penaeus plebejus</i>)	Spawn over extended time frames; peak in May–June	Southern Qld distribution. Spawning in water depths >100 m; use oceanic influenced shallows of estuaries as nurseries.
Endeavour prawn (<i>Penaeus endeavouri</i> ; <i>P. ensis</i>)	Continuous spawning; peak in summer.	Juveniles are associated with inshore seagrass and algal beds.
Grooved tiger prawn (<i>Penaeus semisulcatus</i>)	Early summer and autumn	Prefer seagrass habitats.
Red spot and blue-legged king prawns (<i>Penaeus longistylis</i> ; <i>P. latisulcatus</i>)	Predominantly winter–spring	Northern Qld distribution.

Table 3 Mangrove flora.

Sources: Duke 2006; Duke 1998; Duke et al. 1984, Field 1996; Lovelock 1989; Tomlinson 1986.

Species (common name)	Queensland distribution	Flowering period	Fruiting period
Abbreviations: Salinity tolerance: V = very, Med = medium; pos ⁿ = position; Estuary pos ⁿ : D= downstream, I= intermediate,			
<i>Acanthus ebractiatus</i>	Escape River, tip of Cape York	Sep–Dec	Jan–Feb
<i>Acanthus ilicifolius</i> (holly leaved mangrove)	North of Rockhampton	Sep–Dec	Jan–Feb
<i>Acrostichum speciosum</i> (mangrove fern)	All Qld	-	-
<i>Aegialitis annulata</i> (club mangrove)	North of Tin Can Bay	Nov–Mar	Jan–May
<i>Aegiceras corniculatum</i> (river mangrove)	All Qld	Jun–Sep	Dec–Mar
<i>Avicennia marina</i> (grey mangrove)	Var. <i>australasica</i> sth of 23 deg Lat Var. <i>eucalyptofolia</i> nth of 21 deg Lat	SQ: Summer NQ: Spring	SQ: winter NQ: summer
<i>Barringtonia asiatica</i> (freshwater mangrove)	North Qld	Night flowering	
<i>Barringtonia racemosa</i> (Brackish water mangrove)	North of Townsville	Dec–Jan	Feb–Mar
<i>Bruguiera cylindrica</i> (orange mangrove)	North of Cairns	June	c. Nov
<i>Bruguiera exaristata</i> (orange mangrove)	North of Rockhampton	Sep–Oct	Feb–Mar
<i>Bruguiera gymnorrhiza</i> (large leaf orange mangrove)	All Qld	Jan–Aug	Jan–Jul
<i>Bruguiera X rhynchoptala</i>	North of Cairns	Aug–Sept	Jan–Feb
<i>Bruguiera parviflora</i> (small leaf orange mangrove)	North of Mackay	Aug–Oct	Jan–Feb
<i>Bruguiera sexangula</i> (orange mangrove)	North of Townsville	Aug–Dec	Aug–Sep
<i>Camptostemom schultzi</i> (kapok mangrove)	North of Cooktown	Likely Jan–Feb	Likely Mar–Apr
<i>Ceriops australis</i> (smooth fruited yellow mangrove)	All Qld	Nov	Dec–Jan
<i>Ceriops decandra</i> (yellow mangrove)	North of Townsville	Sep–Mar	Dec–May
<i>Ceriops tagal</i> (yellow [or spurred] mangrove)	All Qld	Nov–Mar	Dec–May
<i>Clerodendrum inerme</i> (mangrove vine)	All Qld	May to Aug	
<i>Crinum pedunculatum</i> (mangrove lily)	East coast of Qld	Nov–Jan	Feb–Mar
<i>Cynometra iripa</i> (wrinkle pod mangrove)	North of Mackay	Sep–Feb Mar–Aug	Mar–Nov Dec–Feb
<i>Derris trifoliata</i> (derris vine)	North of Mackay		

Sowing material	Max Ht	Salinity tolerance	Estuary posn	Tidal posn	Comments
U= upstream. Tidal posn: L= low intertidal, M= medium intertidal, H= high intertidal, c. = <i>circa</i>					
Seed	1-3 m	Low	I	MH	
Seed	1-2 m	Low	IU	MH	May dominate after clearing of mangrove areas.
	2 m	V. low	I	H	Dominates in cleared/disturbed areas. Common in undisturbed areas under freshwater influence.
Propagule	3 m	V. high	D	MH	In sandy or rocky environments.
Propagule	5 m	Low	IU	L	Not tolerant of high salinities.
Propagule	25 m	V. wide	DI	LMH	Most widely distributed mangrove in Australia.
Large buoyant seed	20 m	Low	U	H	Often on beaches in north Queensland. Mangrove associate
Buoyant seed	10 m	Low	U	M	Occurs in freshwater dominated estuaries and is a mangrove associate
Propagule	20 m	Low	DI	M	
Propagule	25 m	Low	IU	H	
Propagule	25 m	Low	DI	MH	
Propagule	15 m	Low	IU	M	Hybrid
Propagule	25 m	Low	DI	M	Yellow-green leaf colour.
Propagule	30 m	Low	IU	MH	
Propagule	25 m	High	DI	LM	More characteristic of open rocky shores than estuarine mangroves.
Propagule	10 m	High	DI	MH	Commonly borders saltpans and arid landward margins
Propagule	10 m	High	I	MH	
Propagule	10 m	High	DI	MH	
Seed	5m	High	D	H	Shrublike
Seed	1 m	Low	U	H	
Pod	15 m	Med	IU	H	Prefer shade, only produce seed in years of high rain, slow growing.
					Widespread vine on mangroves, may be climber or shrub.

Species (common name)	Queensland distribution	Flowering period	Fruiting period
Abbreviations: Salinity tolerance: V = very, Med = medium; pos ⁿ = position; Estuary pos ⁿ : D= downstream, I= intermediate,			
<i>Diospyros littoralis</i> (ebony mangrove)	North of Cairns	Nov	Sep
<i>Dolichandrone spathacea</i> (trumpet mangrove)	North of Cooktown	Sep	Nov
<i>Excoecaria agallocha</i> (milky [blind-your-eye] mangrove)	All Qld	Nov–Feb	Jan–Mar
<i>Heritiera littoralis</i> (looking glass mangrove)	North of Rockhampton	Nov–Mar	Sep–Dec
<i>Hibiscus tiliaceus</i> (Cotton tree)	All Qld	Oct–Jan	Feb–Apr
<i>Lumnitzera littorea</i> (black mangrove)	North of Townsville	Nov–Feb	Feb–Mar
<i>Lumnitzera racemosa</i> (black mangrove)	All Qld	Nov–Feb	Feb–Mar
<i>Lumnitzera x rosea</i> (black mangrove [a hybrid])	North of Townsville	Nov–Feb	Mar
<i>Nypa fruticans</i> (mangrove palm)	North of Townsville	Nov	Dec–Mar
<i>Osbornia octodonta</i> (myrtle mangrove)	North of Tin Can Bay	Dec–Feb	Feb–Mar
<i>Pemphis acidula</i> (reef barrier mangrove)	North of Bundaberg	May–Jun	Dec
<i>Rhizophora apiculata</i> (tall stilted mangrove)	North of Rockhampton	Apr–May	Feb Apr–Oct
<i>Rhizophora mucronata</i> (red mangrove)	North of Townsville	Oct–Dec	Jan–Mar
<i>Rhizophora stylosa</i> (red mangrove)	All Qld	Feb–Apr	All year
<i>Rhizophora x lamarckii</i> (red mangrove)	North of Rockhampton	Aug–Dec	Jan–Mar
<i>Scyphiphora hydrophyllacea</i> (yamstick mangrove)	North of Bundaberg	Oct	Feb–Mar
<i>Sonneratia alba</i> (mangrove apple)	North of Rockhampton	Oct–Dec	Nov–Mar
<i>Sonneratia caseolaris</i> (mangrove apple)	North of Townsville	Sep–Jan, Mar	Nov–Mar, Jun–Aug
<i>Sonneratia lanceolata</i> (red flower mangrove apple)	North of Cooktown	Sep - Oct	Dec–Mar
<i>Sonneratia x gulngai</i> (white flower mangrove apple)	North of Townsville	Oct–Dec	Nov–Mar
<i>Xylocarpus granatum</i> (cannonball mangrove)	North of Tin Can Bay	Dec–Jan	Jun–Sep
<i>Xylocarpus moluccensis</i> (cedar mangrove)	North of Gladstone	Sep–Oct	Dec–Feb

Sowing material	Max Ht	Salinity tolerance	Estuary posn	Tidal posn	Comments
U= upstream. Tidal posn: L= low intertidal, M= medium intertidal, H= high intertidal, c. = circa					
Seed	15 m	Low	IU	MH	
Seed	25 m	Med	U	M	Listed as rare in Nature Conservation Reg (wildlife) 2004
Seed	15 m	Low	DIU	MH	Have milky sap which may damage human eyes.
Seed	25 m	V. low	I	H	Distinctive keeled pod
Seed	15 m	Low	U	H	Important mangrove associate
Propagule	25 m	Low	I	M	
Propagule	15 m	Wide	D	MH	
Propagule	2 m		I	H	A hybrid of <i>L. littorea</i> and <i>L. racemosa</i> .
Seed	10 m	Low	U	LMH	Found upstream in low salinities and calm water.
Seed	5 m	High	D	MH	Crushed leaves have distinctive eucalypt smell.
Seed	7 m	Wide	D	H	
Propagule	25 m	Wide	I	M	In less saline areas than <i>R. stylosa</i> .
Propagule	15 m	Med	IU	LM	
Propagule	30 m	High	D	LM	
Propagule	25 m	High	DI	M	Hybrid of <i>R. apiculata</i> and <i>R. stylosa</i> .
seed	2 m	High	I	H	Intolerant of shady areas.
Seed	20 m	Wide	D	L	
Seed	20 m	Wide	U	L	
Seed	20 m	Wide	U	L	Least common of <i>Sonneratia</i> spp.
Seed	25 m	Wide	I	LM	Hybrid
Seed	22 m	Med	I	MH	
Seed	15 m		I	MH	Related to the red cedar tree of tropical rainforests. Pneumatophores may grow very tall.

Table 4 Seagrasses.

Sources: Lanyon 1986; Larkum et al. 1989; Lee Long et al. 1993, 1996 and 1997.

Species	Queensland distribution	Propagule production (for genera)	Current flow tolerance (knots)	Turbidity tolerance	Disturbance tolerance	Depth range (below MSL*) (m)
<i>Cymodocea rotundata</i>	North of Repulse Bay	Jan–May		Low	Low	
<i>Cymodocea serrulata</i>	All Qld	Jan–May	Wide	Moderate	Low	
<i>Enhalus acoroides</i>	North of Townsville	Possibly all year		Moderate	High	
<i>Halodule pinifolia</i>	North of Hervey Bay	Oct–Jan	High	Moderate	Moderate	0–7
<i>Halodule uninervis</i>	All Qld	Oct–Jan	0–2	Low	Moderate	0–14
<i>Halophila capricorni</i>	Great Barrier Reef region	Sept–Jan	Low	Low	Low	
<i>Halophila decipiens</i>	All Qld	Spring and Summer	Low (0–1)	Wide	Low	3–5
<i>Halophila ovalis</i>	All Qld	Spring and Summer	Wide once established (0–1)	Wide	Moderate	0–14
<i>Halophila ovata</i>	North of Great Sandy Strait	Spring and Summer	(0–1)	Moderate	Moderate	Intertidal
<i>Halophila spinulosa</i>	All Qld	Spring	(0–4)	Moderate	Moderate	3–14
<i>Halophila tricostata</i>	North of Whitsundays	Spring	Low	Wide	Low	
<i>Halophila</i> sp (undescribed)	Shoalwater Bay	Possibly Spring and Summer	High	Moderate	High	
<i>Syringodium isoetifolium</i>	All Qld	Oct–Nov	0–1	Low	Low	0–14
<i>Thalassia hemprichii</i>	North of Great Sandy Strait	Jul–Nov	Moderate	Low	High	
<i>Thalassodendron ciliatum</i>	North of Cape Weymouth	Possibly Oct–Dec	Moderate	Low		
<i>Zostera capricorni</i>	South of Cape Tribulation	Aug–Dec	Moderate	Wide	High	0–7.5

* MSL = mean sea level

Table 5 Saltmarsh vegetation.

Sources: Johns (2006); Carolin and Clarke 1991; Romanowski 1998; Stanley and Ross (1983).

Saltmarsh families: Poaceae (grasses), Cyperaceae (sedges), Juncaceae (rushes), Chenopodiaceae (succulents), Frankeniaceae (sea heaths), Plumbaginaceae (sea lavenders), Aizoaceae (succulents, including pigface).

Species	Queensland Distribution	Flowering period	Growth form	Comments
<i>Atriplex semibaccata</i> (creeping saltbush)	Southern Qld to Cardwell in North Qld	All year	Perennial shrub	Low creeping and grows to 50 cm tall and 1.8 m wide.
<i>Batis argillicola</i>	Northern Qld	Jun–Oct (Fruit Dec–Feb)	Succulent shrub	Grows to 70 cm tall, found mainly in clay soil.
<i>Carpobrotus edulis</i> (pigface)	Southern Qld	Late summer to winter	Succulent creeper	Native to South Africa, useful stabiliser for sandy foredunes.
<i>Carpobrotus glaucescens</i> (pigface)	Southern Qld	Mar–Aug (Fruit in Feb)	Succulent creeper	Useful stabiliser for sandy foredunes.
<i>Cynodon dactylon</i> (green couch)	Entire Qld coast	May–Oct	Grass	Green to purple flowers, often confused with saltcouch but is generally a lower-growing grass, softer to touch and less salt tolerant than saltcouch.
<i>Dissocarpus biflorus</i> (twin flower saltbush)	North of Bundaberg to around Cardwell in North Qld	May–July	Succulent shrub	Silver grey stems, short lived perennial grows to approximately 40 cm high.
<i>Dysphania littoralis</i> (red crumbweed)	Southern Qld to Cardwell in North Qld	All year	Succulent	White inconspicuous flowers, grows in a mat up to 30 cm wide and height of 5–10 cm, may be poisonous to some grazing animals.
<i>Enchylaena tomentosa</i> var. <i>glabra</i> (ruby salt bush)	Most of Qld but less common north of Townsville and on Cape York	Sep–May	Succulent shrub	Grows to 1 m tall, fruit varies in colour from green through to yellow and red prior to ripening, may be confused with seablite (saltbush leaves originate from the stem whereas seablite has a more branched form).
<i>Fimbristylis ferruginea</i> (rusty sedge)	Entire Qld coast	May - Jul	Perennial sedge	Tufted and growing 20–65 cm tall.
<i>Fimbristylis polytrichoides</i> (rusty sedge)	Entire Qld coast	May - Jul	Perennial sedge	Small (5–30 cm tall) and densely tufted.
<i>Halosarcia halocnemoides</i> (glasswort)	Intermittent patches along the entire Qld coast	Dec–Mar (Southern Qld) Jun–Jul (Northern Qld)	Shrubs with succulent 'leaf' structures	Grows to around 30 cm, found in saltmarshes in littoral areas.
<i>Halosarcia indica</i> (<i>Salicornia indica</i>) (glasswort)	Intermittent patches along the entire Qld coast	Dec–Mar (Southern Qld) Jun–Jul (Northern Qld)	Shrubs with succulent 'leaf' structures	Grows up to 1.0 m high, found in saltmarshes in littoral areas.
<i>Halosarcia pergranulata</i> (glasswort)	Intermittent patches along the entire Qld coast	Dec–Mar (Southern Qld) Jun–Jul (Northern Qld)	Shrubs with succulent 'leaf' structures	Grows up to 1 m high, found in saltmarshes in littoral areas.
<i>Isolepis cernua</i> (nodding club rush)	South East Qld to Bundaberg	Sep–Mar	Grass-like sedge	Grows to 30 cm tall.

Species	Queensland Distribution	Flowering period	Growth form	Comments
<i>Isolepis nodosa</i> (Knobby club rush)	South East Qld	All year	Densely tufted perennial rush	Grows to a height of 30–90 cm.
<i>Juncus bufonius</i> (toad rush)	South East Qld to Bundaberg	Sep–Mar	Annual tufted rush	Grows to a height of 20–30 cm.
<i>Juncus kraussii</i> (jointed rush)	South East Qld	All year	Perennial rush	Grows to 50 cm tall.
<i>Limonium australe</i> (native sea lavender)	South East Qld to Mackay	Sep–Mar	Perennial herb	Pale pink flowers, grows to 40 cm tall.
<i>Limonium solanderi</i> (native sea lavender)	South-east Qld to Townsville	Sep–Mar	Perennial herb	Yellow flowers, grows to 40 cm tall.
<i>Phragmites australis</i> (common reed)	Entire Qld coast	Sep–Oct	Grass	Grows to 4 m tall in both fresh water and brackish water.
<i>Portulaca bicolor</i> (pigweed)	North of Bundaberg	All year	Succulent	Yellow or purple flowers, common in salt pans.
<i>Portulaca oleracea</i> (purslane/pigweed)	Entire Qld coast	Dec–Mar	Succulent creeper	Yellow flowers, low growing with spoon shaped leaves.
<i>Portulaca pilosa</i> (purslane/pigweed)	Entire Qld coast	Dec–Mar	Succulent creeper	Pink flowers, low growing at salt pan edge and urban areas.
<i>Samolus repens</i> (creeping bushweed)	South-east Qld to Bundaberg	Sep–Mar	Perennial creeper	White flowers, grows to height of 10–30 cm and width 5–60 cm.
<i>Salsola kali</i> (prickly saltwort)	Widespread through Qld, except in Northern Cape York	Sep–Mar	Succulent shrub	White flowers with a tinge of green, grows up to 1 m high on the edge of saltmarsh and dunal areas.
<i>Sarcocornia quinqueflora</i> (beadweed, tree samphire)	All Qld	Nov–Feb	Succulent	<i>Sarcocornia</i> appears more tolerant of high salinities than <i>Sporobolus</i> .
<i>Sesuvium portulacastrum</i> (sea purslane)	Entire Qld coast	All year	Succulent	Pink flowers, grows to 20 cm high, found in sandy areas and saltmarshes along beaches.
<i>Sporobolus virginicus</i> (saltwater couch/sand couch)	All Qld	All year	Grass	Found in drier areas of saltmarsh and those under freshwater influence. Grows in upper tidal, inter-tidal and some inland areas to a height of 15–30 cm. It prefers sandy soils and tends to form dense, low mats of vegetation. Generally high competitive ability (compared with other saltmarsh species).
<i>Suaeda arbusculoides</i> (samphire or jelly bean plant or seablite)	Eastern Qld coast	Sep–Mar	Succulent	Common in saline areas, grows to 30cm.
<i>Suaeda australis</i> (saltbush/samphire bush or seablite)	Eastern Qld coast	Sep–Mar	Succulent	Grows to 80cm.
<i>Tecticornia australasica</i> (grey samphire)	Gulf of Carpentaria. Intermittent patches north from Mackay	Jun–Dec	Succulent	Grows to 40cm high, new plants usually germinate from March to April after heavy rainfall.

Species	Queensland Distribution	Flowering period	Growth form	Comments
<i>Triglochin striatum</i> (streaked arrow-grass)	Southern Qld to south of Mackay	Nov–Dec	Emergent narrow leaved grass	Perennial, inhabits tidal and freshwater swamps or on muddy creek banks. Found in wetter parts of saltmarsh.
<i>Xerochloa imberbis</i> (rice grass)	From Cardwell to the NT border	April to October	Perennial grass	Grows in areas with low moisture.

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Appendix 2

Translocation of marine plant species

Movement of marine plant species may involve the collection of appropriate material, such as seeds, seedlings, rhizomes, cuttings, and entire plants, and taking these living plant materials from one area (source) to relocate to the wild in another area (host).

There are a number of potential consequences of moving plants: environmental and disease/parasite. Environmental concerns include a genetic shift in wild populations, establishment of feral populations, impacts on other species and movement of associated species. Disease and parasite concerns include the introduction of pathogens exotic to the new environment with the possibility of subsequent infection of local species, especially those related to the introduced species. Translocation is one type of movement of materials and is defined as:

- the movement of live aquatic material (including all stages of the organisms/life cycle and any derived, viable genetic material):
- beyond its accepted distribution and
- to areas which contain genetically distinct populations, or
- to areas with superior parasite or disease status.³³

Policy

Translocation of marine plants is not supported. However, movement of marine plants within their accepted distribution is supported, subject to an assessment of the following considerations prior to any proposed movement:

- The removal of individuals is unlikely to pose an unjustifiable risk to the source population.
- The host area has suitable and sufficient habitat for the survival of the species.
- The species being translocated is likely to have no unjustifiable adverse impact, including the spread of disease or parasites, upon the host area.
- The factors that caused the species decline in the host area have been identified and are being reversed, and are unlikely to occur in the future.
- The genetic viability is not compromised at the host area;
- Other potential threats are unlikely to compromise the success of the translocation.
- Satisfying approval requirements under the Fisheries Act.

Restoration projects within a declared FHA are further limited in that the source and host areas must lie within the boundary of the FHA.

Case study: *Avicennia marina*—the grey mangrove

The genus *Avicennia* sits within the monogeneric family Avicenniaceae. *A. marina* is found throughout the foreshores of East Coast and Gulf of Queensland, and has three varieties (Duke 2006; Duke et al. 1998a; Duke et al. 1998b; Duke 1991), two of which occur along foreshores in Queensland: *A. m. var. australasica* and *A. m. var. eucalyptifolia*.

Within Queensland, the distributions of these two varieties are relatively discrete with the former (*A. marina var. australasica*) extending from Rockhampton south to the NSW border, while the latter (*A. marina var. eucalyptifolia*) extends from Mackay north to Cape York, across the Gulf of Carpentaria and to Darwin. The boundary between the two varieties is between Rockhampton and Mackay with a degree of overlap.

³³ Ministry Council on Forestry, Fisheries and Aquaculture 1999 *National policy for the translocation of live aquatic organisms—issues, principles and guidelines for implementation*, 31 pp.

Policy position

Seeds, seedlings or other plant material of the grey mangrove, *A. marina*, may only be considered for foreshore restoration projects within either of these 2 (two) coastal regions, provided the proposed source and host areas are intraregional, as follows:

- Corio Bay south to Tweed River—*A. marina* var. *australasica*
- Broadsound north to Cape York and west to Massacre Inlet, NT border—*A. marina* var. *eucalyptifolia*.

Collection and propagation of seeds

Seed characteristics: cotyledon in a thin soft pericarp; buoyant but flotation times of a few days only; settlement occurs following initial root formation.

Dispersal factors include: propagule size; water quality; substrate condition; tidal position; immersion time before settling; germination and root formation time; resistance to predators and viability.

Establishment factors include: light tolerance; exposure to wind/wave action; low energy foreshore; salinity; predation and shade.

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Appendix 3

Mangrove Status in Queensland

Mangroves in Queensland are protected under the Fisheries Act, along with all plant vegetation that occurs within or adjacent to the tidal zone. Different mangrove species provide diverse roles in the nurture and support of fish and other aquatic life that may use mangrove forests for part or all life stages. Primary productivity through conversion of the sun's energy to plant tissue, and the subsequent senescence and breakdown through grazing by crabs, snails and bacteria, powers the estuarine food chain.

Apart from their roles in supporting fisheries production and biodiversity, mangroves also play a role in protecting coastlines from erosion and taking up nutrients from runoff from catchments. Recognition of the importance of these marine plants has led to greater interest in their rehabilitation and restoration in areas that have been subject to degrading processes or other disturbances.

To inform future restoration efforts so that diversity and genetic integrity of mangroves communities in Queensland are maintained, the status and distribution of mangroves is outlined briefly below.

Through the process of mapping Queensland's regional ecosystems for declaration under the *Vegetation Management Act 1999* and *Vegetation Management Regulation 2000*, mangrove communities and other plant communities associated with coastal wetlands are now listed as regional ecosystems (see Table 6). According to this classification system, mangrove communities are listed as 'not of concern at present'. However, threatening processes such as impacts from development and climate change could alter the status of these valuable ecosystems.

The only mangrove species listed as rare in the *Qld Nature Conservation (Wildlife) Regulation 1994* is *Dolichandrone spathacea*. This species is listed as occurring in the Great Barrier Reef World Heritage Area (GBRWHA) (also listed in the Cape York Peninsula bioregion) in a paper by Dr Norm Duke in the proceedings of the 'State of the Great Barrier Reef World Heritage Area Workshop', 1998. The relict nature of mangrove populations in the GBRWHA means that these communities are genetically isolated and vulnerable to environmental change (Duke 1998).

Duke (1992) describes the floristics and biogeography of mangroves in Australia (and the world), and concludes that the current distribution of some mangrove species is remnant of past distributions due to geological and climatic changes. In addition, each mangrove species distribution is affected by environmental factors such as salinity, rainfall and temperature, physical attributes of estuaries that provide suitable habitats for colonisation and current patterns and longevity of propagules for dispersal of genetic material.

Dowling and McDonald (1982) also discuss the distribution and floristics of mangrove species, and observe that a greater number of species occurs in the wetter northern tropics, especially in the landward margin of mangroves. However, it is the landward margin species that are more scattered and rare in distribution.

Table 6. Coastal regional ecosystem descriptions of marine and terrestrial vegetation communities (Sattler and Williams, 1999). (Note: '±' means may or may not be present in that community).

Regional ecosystem	Conservation status
<p>Gulf Plains</p> <p>Offshore tidal flats; sands and muds; mostly unvegetated, but including areas of seagrass communities.</p> <p>Low coastal rises formed by wind and wave action and subject to tidal inundation; mainly saline mud, possibly with accumulating shell materials and sands; low shrublands and woodlands dominated by <i>Avicennia</i> sp.</p> <p>Margins and levees of channels subject to tidal inundation; saline muds; mangrove communities including <i>Avicennia</i> sp., <i>Rhizophora stylosa</i>, <i>Ceriops tagal</i>, <i>Lumnitzera racemosa</i>, <i>Aegialitis annulata</i>, <i>Excoecaria agallocha</i>, <i>Xylocarpus</i> sp., <i>Bruguiera exaristata</i> and <i>Aegiceras corniculatum</i>.</p> <p>Saline clay plains; periodically inundated; solonchaks; predominantly unvegetated but includes areas of <i>Halosarcia</i> spp., <i>Salicornia</i> spp. and <i>Suaeda</i> sp. on slightly higher areas.</p> <p>2.2.1 Beaches and foredunes.</p> <p>2.2.2 Secondary dunes and swales.</p> <p>2.3.1 Grasslands on low plains adjacent to estuarine zone.</p> <p>2.3.4 Freshwater and brackish wetlands in old river channels on low plains adjacent to estuarine zone.</p>	<p>All not of concern at present except for 2.3.4 which is of concern.</p> <p>Special ecological values: of national significance for waders and dugongs.</p>
<p>Cape York Peninsula</p> <p>Closed forest of <i>Rhizophora stylosa</i> ± <i>Bruguiera gymnorhiza</i> ± <i>Avicennia marina</i>. <i>Avicennia marina</i> ± <i>Ceriops tagal</i> low open forest to low closed forest <i>Ceriops tagal</i> ± <i>Avicennia marina</i> low closed forest <i>Excoecaria agallocha</i> ± <i>Aegiceras corniculata</i> ± <i>Lumnitzera</i> spp. Closed scrub with emergent <i>Avicennia marina</i>. <i>Sporobolus virginicus</i> closed tussock grassland Sparse herbland or bare saltpans with areas of <i>Halosarcia</i> spp. Sparse forbland and/or <i>Xerochloa imberbis</i> and /or <i>Suriana maritima</i> woody forbland or <i>Sesuvium portulacastrum</i> open herbland.</p>	<p>All no concern at present.</p> <p>The rare mangrove species <i>Dolichandrone spathacea</i>, occurs in this bioregion.</p>
<p>Wet Tropics</p> <p>Mangrove forest complex on fine anaerobic silts, inundated with saline water at high tide. Main component: medium closed mangrove forest (<i>Rhizophora</i> spp., <i>Bruguiera</i> spp.) and scrub (<i>Avicennia eucalyptifolia</i>, <i>Ceriops</i> spp.).</p> <p>Salt meadow herbfield with <i>Sporobolus virginicus</i>, <i>Halosarcia indica</i> and <i>Suaeda australis</i> on fine anaerobic saline silts. Bare saltpans may dominate in extremely saline situations.</p> <p>Closed <i>Elaeocharis dulcis</i> sedgeland (Bulkuru swamp) on poorly drained soils with a highly organic or peaty surface in conjunction with a permanent surface watertable (often slightly brackish). Occasional <i>Baumea rubiginosa</i>, <i>B. articulate</i>, <i>Lepidosperma laterade</i> and <i>Acrostichum speciosum</i>.</p>	<p>7.1.1 and 7.1.2 No concern at present.</p> <p>Special ecological values: important fish nursery areas, habitat of vulnerable ant plant <i>Myrmecodia beccarii</i>.</p> <p>7.1.3 is Of concern.</p>
<p>Central Queensland Coast</p> <p>Mangrove low closed forest and saltpan vegetation associated with Quaternary estuarine deposits. Major species include <i>Sporobolus virginicus</i>, <i>Sesuvium portulacastrum</i>, <i>Sarcocornia quinqueviria</i>, <i>Ceriops tagal</i> and <i>Avicennia marina</i></p>	<p>No concern at present.</p>

Regional ecosystem	Conservation status
<p>Brigalow Belt</p> <p>Sporobolus virginicus grassland on Quaternary estuarine deposits.</p> <p>Samphire forbland on Quaternary estuarine deposits.</p> <p>Sedgelands in depressions on Quaternary estuarine deposits.</p> <p>Mangrove low forest on Quaternary estuarine deposits.</p>	<p>11.1.1, 11.1.2, 11.1.4 No concern at present.</p> <p>11.1.3 Of concern—most at threat from coastal development.</p>
<p>South East Queensland</p> <p><i>Casuarina glauca</i> ± <i>Melaleuca quinquenervia</i> or <i>M. fluviatilis</i> (in extreme north of bioregion) open forest on margins of Quaternary estuarine deposits.</p> <p>Saltpan vegetation comprising <i>Sporobolus virginicus</i> grassland and samphire herbland on Quaternary estuarine deposits. Grasses including <i>Bothriochloa decipiens</i> sometimes present in upper portions of tidal flats. Marine plains/tidal flats.</p> <p>Mangrove shrubland to low closed forest on Quaternary estuarine deposits.</p>	<p>12.1.1 Of concern.</p> <p>12.1.2, 12.1.3 No concern at present.</p>

Regional ecosystem descriptions can be accessed via the EPA website: www.epa.qld.gov.au/nature_conservation/biodiversity/regional_ecosystems/introduction_and_status

Appendix 4

Urban Mangrove Management Strategy development

Background

One of the outcomes of the DPI&F 2004 Urban Mangrove Management Workshop was to foster development of a strategic approach to the management of mangrove communities. The initial component of this approach is the development of UMMS with local governments (LGs) responsible for managing development and infrastructure along river banks within their LG area.

Although mangroves are the marine plants specifically mentioned in existing management strategies based on experiences with these particular fish habitats, the strategic approach does not limit its application to other vegetated or non-vegetated tidal fish habitats. For example, the development and use of similar strategies is encouraged for management of coastal saltmarsh communities where regular burning off currently occurs. Reference to DPI&F Fish Habitat Guidelines, in particular the *Fisheries Guidelines for Fish Friendly Structures* (FHG 006) and *Fish Habitat Buffer Zones* (FHG 003), is highly recommended.

Aims

- To foster shared understanding of importance of vegetated marine fish habitats to fisheries production and to social, economic and environmental values of the local community.
- To identify, endorse and document key mangrove communities that will be protected from future development and/or will be restored.
- To provide a consistent strategic framework for LG planning and undertaking public infrastructure maintenance and development works within and adjacent to sensitive tidal fish habitats.
- To support innovative operational management techniques (such as trimming, canopy lifting and restoration) within agreed sections of marine plant communities to achieve long-term protection of tidal fish habitats and meet community requirements for passive recreation and access (e.g. fishing, viewing river-based activities).
- To reduce costs of administration (to both LG and DPI&F) associated with the integrated development assessment process and fisheries development approvals.

Key elements

The key elements of an UMMS include the following:

Selection of area

The agreed area to be covered by a strategy may be the total LG area or include one or more of the following: a section of river or creek, a section of coastal or lake foreshore or an inshore island. The agreed area may be extended at a later date. The agreed area may also be sub-divided into smaller, practical units to reflect priorities and to facilitate future operational management.

The UMMS should reflect the overall planning approach for the nominated area under consideration, and include sections that relate to the categories of management that will apply within each of the units:

- **Protect** areas where existing marine plant communities are maintained and natural processes, such as further colonisation and marine plant community development, are allowed to occur. These areas benefit from being linked to terrestrial vegetated buffers to provide long-term protection.
- **Restore** areas where opportunities to enhance existing marine plant communities exist and actions may be taken to reduce or remove threatening processes to support natural regeneration.
- **Keep free:** existing marine plant-free areas are maintained in that treatment of the bank and maintenance activities need not specifically allow for colonisation of marine plants.
- **Multiple use** (marine plant modification): for areas where impacts to marine plants are minimised while meeting specific public use requirements and may include treatments that remove or modify marine plants. A site-based operational plan will identify the most appropriate treatments (e.g. crown lifting, trimming, thinning or replacement of taller varieties with smaller or lower-growing forms).

Preparation of the strategy

The UMMS area is defined spatially through detailed maps—preferably recent aerial photographs overlain with the proposed management treatments of each unit.

LG should undertake a mapping exercise of bank vegetation, bank condition and an audit of existing and proposed public and private infrastructure within the area.

The strategy should:

- provide information on its links to the LG planning scheme and any other relevant local or state government strategic planning documents (e.g. flood maps, urban stormwater quality environmental management plans, asset management plans, State Coastal Management Plan, Regional Coastal Management Plans, biodiversity plans, etc.)
- reflect the responsibilities and jurisdiction of DPI&F and the LG for marine plant protection and management, and specify how it meets the policy targets of the Fish Habitat Management Operational Policy *Management and protection of marine plants and other tidal fish habitats* (FHMOP 001)
- provide the community and developers with direction on the desired future environmental outcomes for the strategy area, and be the basis for agreed planning for future development with LG and relevant government agencies
- include a clear process for development of the site-based operational plans for future works and direct links to the agreed management categories described above.
- Works outlined in these site-based operational plans can be undertaken as self-assessable works under MPO6, once this code is gazetted.

Keystones for success

The keystones for success in developing an UMMS:

- Identify a ‘champion’ who is willing to promote the concept within the LG.
- Be aware that it can be a long process (3–5 years, or longer).
- Prior to consultation with the wider community, the LG should reach agreement with DPI&F and other relevant government agencies (e.g. EPA, NRMW, Main Roads) on content and direction of the draft strategy.
- Establish an interagency steering committee (including representatives from local and state governments, fishing groups, conservation groups, NRM groups and progress associations), to be hosted by the LG, to identify and deal with progressing the drafting and implementation of the strategy, which may assist with consultation processes.
- Emphasise the mutual benefits of the implementation of mangrove/marine plant management strategy (lower costs, more long-term planning certainty, greater understanding between agencies, etc).
- Demonstrate LG commitment to development and implementation of the strategy. DPI&F officers will assist with discussing, drafting and supporting the strategy, and will help to overcome ‘roadblocks’ as much as possible.
- Make draft strategy available to the community for comment in a similar way as required for amendments to planning schemes. Consultation with specific stakeholders should also be arranged, including commercial and recreational fishing groups, conservation groups, progress associations, etc.

Delivery and implementation

- Monitoring and evaluation must occur to allow for any necessary modifications to the strategy and for data exchange from marine plant manipulation trials and restoration efforts.
- Development proposals that occur within the strategy area are assessed against its objectives. Assessment staff should refer to the strategy, and proposals should be run past the interagency steering group for endorsement as fitting with the outcomes of the strategy.
- Promotion of the existence and role of the strategy must continue in ongoing implementation for future development proposals.
- A review date for the strategy should be set every 2 years to make amendments, as appropriate and agreed.

Links to Fisheries IDAS self-assessable codes

Currently, LGs can undertake low-impact maintenance works on existing lawful structures, such as public ferry terminals, boardwalks and open drains, under a self-assessable IDAS code (MPo2). Works under a DPI&F self-assessable IDAS code do not require further approvals from DPI&F, although notification of works is required. While the current self-assessable maintenance code meets a number of the specific LG needs, there are additional benefits in developing an UMMS. As previously detailed, these benefits include agreed protection for key mangrove communities, certainty for works programs and budgets and reduced bureaucracy.

Once the UMMS is in place, it will cater for works additional to those covered under a self-assessable code, including certain works not normally supported for a Fisheries DA. For example, trimming of marine plants to provide for public amenity is not supported for approval under current DPI&F fish habitat management policies or under any self-assessable code. However, these works can be considered and incorporated within an UMMS for the appropriate management category.

Note that the agreed UMMS will be recognised in the new fisheries IDAS code for self-assessable development for minor impact works (MPo6). This will mean that LGs with an agreed UMMS in place will not require a fisheries DA for the agreed works as specified within the UMMS.

Contacts for assistance

To discuss any proposed plans, negotiations or problems in developing mangrove management strategies with local governments, please contact:

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Appendix 5

Managing climate change impacts on fish habitats

The term 'climate change' is used to explain the accelerated changes to general weather conditions as a result of increased levels of greenhouse gases in the atmosphere, ozone depletion, air pollution and land clearing, in addition to natural factors.

The management objective of having increased connectedness in the tidal landscape is not new, and climate change adds to the priority for meeting this objective. The potential risk that increased connectedness may lead to greater habitat for and movement of pests, weeds and fire also needs to be managed.

Key impacts from climate change for fish habitats

- increased mean sea level
- salt water intrusion into ground water and coastal fish habitats
- changes to downstream flows
- increased coastal flooding (e.g. when combined with storm surge)
- increases severity of coastal storms and destruction of fish habitats
- acidification of marine waters.

Particular sensitivities to climate change are likely at local and regional levels

- tidal foreshores, as these have species stratified across the tide profile and may be restricted in area
- claypans with low relief, where a small change in rising sea level corresponds to a large geographic shift of climate conditions favourable to colonisation by species from adjacent areas
- migratory species, as these use a diversity of habitats (e.g. spawning, juvenile, adult)
- species with restricted distributions and limited dispersal ability and reproductive capacity.

The distribution of marine vegetation is almost identical with that of coastal ASS, and the former may be used as a surrogate for the presence of ASS. In terms of climate change, coastal ecosystems including mangroves, saltmarsh and seagrasses are among the most vulnerable. In the event of sea-level rise, habitat change (e.g. where saltmarshes are replaced by mangroves) and biodiversity loss in inshore areas may impact on the accessibility to habitats used by dependent fisheries species.

The importance of avoiding wetland disturbance has been highlighted in research. CSIRO investigated a connection between wetland drainage and production of greenhouse gases at East Trinity, Cairns, with findings that carbon dioxide and ammonia emissions are generated when intertidal wetlands are drained and ASS are exposed (Hicks et al. 1999).

Buffers to protect fish habitat and reduce the loss of habitat biodiversity should be implemented. Buffers will allow for landward migration of tidal habitats as sea level rises. These also serve to protect marine plant communities and their functions as 'carbon sinks', contributing to a reduction in greenhouse gas production and retaining accessibility to inshore nursery habitats for use by species of economic importance to fisheries.

Climate change considerations during assessment of development applications

Applicants should outline the implications of their proposed development in relation to the following climate change elements:

- tidal flow regimes, in and adjacent to the site
- distribution of fish habitats
- connectivity of fish habitats
- capacity for landward or poleward migration of fauna and plant species
- dynamics of restricted isolated populations
- effect of the development on resilience of habitats to climate change.

Climate change offsets

Conservation of fish habitats will always be the most effective and least expensive means of maintaining these habitats. Offset opportunities to respond to climate change impacts include:

- preventing further land-clearing and loss of habitats
- preventing and managing introductions of new invasive species
- maintaining or restoring environmental flows, fish passage and water quality
- preventing or minimising salinity intrusion
- reducing nutrient and sediment flows to adjacent fish habitats.

Additional actions that assist or augment the long-term and natural adaptation of fish and fish habitats to climate change include:

- increasing the connectivity in the fish habitats, including buffers, corridors and 'stepping stones'
- rehabilitating degraded fish habitats, including revegetation of disturbed lands and restoration of waterways
- preserving key habitats that act as reservoirs under future climates
- ensuring marine protected areas are established and managed to allow species to migrate within, to and from these areas
- translocating species (noting the risks involved).

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Glossary

acid sulfate soils (ASS)

The common name given to naturally occurring sediments and soils containing iron sulfides (principally iron disulfide, also called pyrite, iron monosulfide or their precursors). The exposure of the sulfide in these soils to oxygen (e.g. by drainage or excavation) leads to the generation of sulfuric acid. The term acid sulfate soils generally include both actual and potential acid sulfate soils. Acid sulfate soils are commonly encountered at or below 5 m AHD and may be associated with tidal vegetation, back swamps and wetlands.

adjacent

Refer to section 9.1 of this policy.

aquaculture

The cultivation of live fisheries resources for sale other than in circumstances prescribed under a regulation (Schedule Dictionary, *Fisheries Act 1994*).

aquaculture fisheries resources

Live fish and marine plants cultivated in aquaculture (Schedule Dictionary, *Fisheries Act 1994*).

artificial waterways

Waterways that are fully constructed and revetted with hard armouring, and that are the result of dredging/excavation.

authority

A licence, permit, quota or other authority in force under the Fisheries Act (Schedule Dictionary, *Fisheries Act 1994*).

beach replenishment

The placement of sand along a beach to supplement the quantity of sand within an existing beach system. Also known as beach nourishment, beach renourishment, beach restoration and beach fill.

biodiversity

The diversity of plant and animal life on earth at the genetic, species and ecosystem levels.

clamation

See **filling of tidal land**.

declared Fish Habitat Area

An area declared under section 120 of the *Fisheries Act 1994* to be a fish habitat area.

development approval

Under the *Integrated Planning Act 1997*, a development approval is required for certain development. A development approval may be in the form of a preliminary approval, a development permit or a combination of both.

ecosystem

A system of plants, animals and micro-organisms together with the non-living components of their environment. No ecosystem is a closed system, and the precise meaning varies according to the context.

ecologically sustainable development (ESD)

DPI&F supports the management of Queensland's fisheries resources in accordance with the principles of ESD. Specifically:

- maintenance of ecological systems and protection of biodiversity
- dealing cautiously with risk, uncertainty and irreversibility (the Precautionary Principle)
- intragenerational equity, which incorporates the costs and benefits of development for all existing sections (environmental, economic, social and cultural) of the community
- intergenerational equity, which provides for the needs of future generations, particularly in terms of protection of biodiversity and the maintenance of ecological systems through proper resource management.

emergency

An unforeseen occurrence, occasioning sudden and urgent action to rectify a danger to public health or safety.

environmental management plan (EMP)

A plan to manage and/or ameliorate environmental impacts of proposed works. EMPs are developed as conditions annexed to a permit issued for a major development proposal. They incorporate contingency plans for any activities that may impact on fish habitats. EMPs include performance criteria, reporting, mitigation and monitoring procedures.

filling of tidal land

The placement of fill to raise the substratum level of submerged or intertidal land to create terrestrial land that is above the level of HAT and free from tidal inundation. There are two biologically significantly different forms of filling:

- Reclamation—through reinstatement of terrestrial lands that have recently become tidal, through erosion processes. The period that such lands have been tidal is relatively short and re-conversion to terrestrial land constitutes a return to a recent, pre-existing state. Such filling is characteristically a management response for erosion control. This form of filling is likely to be more justifiable from a fisheries perspective as the tidal lands have existed for a relatively short period.
- Clamation—through conversion of tidal lands to terrestrial lands, where these have historically been tidal. This is described as ‘clamation’ because the terrestrial land is to be created on lands that have endured as tidal through natural processes in the long term. Such filling is characteristically associated with development of new marine facilities or expansion of existing facilities (e.g. ports, marinas). Impacts of this form of filling on fish habitats and fisheries resources are greater due to the permanent loss of the tidal lands.

fish

The *Fisheries Act 1994* defines fish in section 5:

- (1) Fish means an animal (whether living or dead) of a species that throughout its life cycle usually lives—
 - (a) in water (whether freshwater or saltwater); or
 - (b) in or on foreshores; or
 - (c) in or on land under water.
- (2) Fish includes—
 - (a) prawns, crayfish, rock lobsters, crabs and other crustaceans; and
 - (b) scallops, oysters, pearl oysters and other molluscs; and
 - (c) sponges, annelid worms, bêche-de-mer and other holothurians; and
 - (d) trochus and green snails.
- (3) However, fish does not include—
 - (a) crocodiles; or
 - (b) protected animals under the *Nature Conservation Act 1992*; or
 - (c) pests under the *Pest Management Act 2001*; or
 - (d) animals prescribed under a regulation not to be fish.
- (4) Fish also includes—
 - (a) the spat, spawn and eggs of fish; and
 - (b) any part of fish or of spat, spawn or eggs of fish; and
 - (c) treated fish, including treated spat, spawn and eggs of fish; and
 - (d) coral, coral limestone, shell grit or star sand; and
 - (e) freshwater or saltwater products declared under a regulation to be fish.
- (5) A regulation under subsection (4)(e) may declare a product to be fish only—
 - (a) for a particular provision of this Act; or
 - (b) if the product is used for a particular purpose.
- (6) Subsection (5) does not limit the *Statutory Instruments Act 1992*, section 24 or 25.1

fisheries development

Assessable or self-assessable development relating to aquaculture, fisheries resources, fish habitat or waterway barrier works (Schedule Dictionary, *Fisheries Act 1994*).

fisheries development approval (DA)

A development approval for which the chief executive is assessment manager or a concurrence agency (Schedule Dictionary, *Fisheries Act 1994*).

fish habitat

Includes land, waters and plants associated with the life cycle of fish, and includes land and waters not presently occupied by fisheries resources (Schedule Dictionary, *Fisheries Act 1994*).

fisheries resources

Includes fish and marine plants (Schedule Dictionary, *Fisheries Act 1994*).

land

Includes foreshores and tidal and non-tidal land (Schedule Dictionary, *Fisheries Act 1994*).

management plan

Subordinate legislation under section 32 of the *Fisheries Act 1994* that applies to fisheries resources. The Act sets out what a management plan must deal with.

marine plant

See section 4 of this policy and section 8 of the *Fisheries Act 1994*. 'Marine plant' does not include a plant that is a declared pest under the *Land Protection (Pest and Stock Route Management) Act 2002*.

offsets

Offsets (environmental) are positive measures taken to counterbalance negative environmental impacts that cannot otherwise be avoided or minimised. An offset may be located within or outside the geographic site of the development and should be legally secured. Reference should be made to FHMOP 005 and the Queensland Government Environmental Offsets Discussion Paper (2007), available at www.epa.qld.gov.au

pontoon

As defined in the *Coastal Protection and Management Regulation 2003*:

pontoon means a structure consisting of the following components—

- (a) a flotation unit;
- (b) an access walkway for the flotation unit;
- (c) a system for mooring the flotation unit and access walkway;
- (d) an abutment.

reclamation

See **filling tidal land**.

rehabilitation

Involves actions that return a site to a state where natural succession can continue the recovery process and allow fisheries values of the site to be returned.

resource entitlement

The right to access and use a state resource, as allocated or required to be allocated by a state agency, in accordance with schedule 10 of the *Integrated Planning Regulation 1998*.

restoration

Involves actions to return a site to an agreed pre-existing condition. Implies a final objective to return all aspects of the previous system.

restoration actions

The tasks and requirements that are to be completed as part of restoration as set out in a Restoration Notice.

sapling

A young tree grown to the sapling stage that is 1.5 to 2 meters high and up to 10 cm in diameter at breast height.

seedling

A young plant grown from seed, or any recently-sprouted plant, or the next growth phase of the leaves after the cotyledons but before the juvenile leaves.

stakeholders

Commercial, recreational and indigenous fishers; landholders; developers; consultants; port authorities; local government and other government agencies; aquaculture industry; researchers; educational institutions; river improvement trusts; catchment management groups and other non-government organisations.

state resources

As defined under section 12 and schedule 10 (items 11, 12 and 13) of the *Integrated Planning Regulation 1998* for section 3.2.1(5) of the *Integrated Planning Act 1997*.

tidal land

Tidal land is any land at or below the HAT mark, including mudflats, sandbanks, 'reefs, shoals and other land permanently or periodically submerged by waters subject to tidal influence' (Schedule Dictionary, *Fisheries Act 1994*).

trimming

- includes trimming as ‘pieces cut off in trimming, clipping, paring or pruning’
- includes pruning as ‘to cut or lop superfluous or undesired twigs, branches or roots from; to trim; to remove’
- is undertaken using hand tools
- is to comply with Australian Standards of pruning techniques—see AS4373-1996 Pruning of Amenity Trees.

Acronyms

- AHD**
Australian Height Datum
- ASS**
acid sulfate soils
- CoG**
Coordinator General
- ESD**
ecologically sustainable development
- DA**
fisheries development approval
- EIS**
Environmental Impact Statement
- EMP**
Environmental Management Plan
- FHA**
declared Fish Habitat Area
- GBRWHA**
Great Barrier Reef World Heritage Area
- HAT**
highest astronomical tide
- IDAS**
Integrated Development Assessment System
- IPA**
Integrated Planning Act 1997
- LG**
local government
- MCU**
material change of use
- MoA**
Memorandum of Agreement for the co-ordination and provision of evidence of ‘resource entitlement’ for tidal works, including prescribed tidal works
- NRW**
Department of Natural Resources and Water
- PP**
policy principles
- RAA**
resource authority allocation
- UFHM Research Program**
Urban Fish Habitat Management Research Program
- UMMS**
Urban Mangrove Management Strategy
- USL**
unallocated state land

