water reforms

NSW Weirs Policy

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CONTEXT

In 1994 the Council of Australian Governments recognised that widespread natural resource degradation has occurred in Australia that has impacted on the quality and/or quantity of the nation's water resources. It adopted a framework for the efficient and sustainable reform of the water industry that included making formal allocations to the environment, based on the best scientific information available.

In September 1995, the Minister for Land and Water Conservation announced that a State-wide review of weirs would take place as part of the water industry reforms. The State Weirs Policy provides the framework for that review and establishes the goals and principles for the ongoing approval and management of weirs.

The State Weirs Policy is a further component of the *State Rivers and Estuaries Policy*, which was approved by the NSW Government in 1991. The *State Rivers and Estuaries Policy* establishes the framework for the management of rivers and estuaries of NSW and related ecosystems, such as wetlands. It is based on the Total Catchment Management philosophy, defined in the Catchment Management Act 1989 as "the coordinated and sustainable use and management of land, water, vegetation and other natural resources on a catchment basis so as to balance resource utilisation and conservation". Other policies under this framework include the State Wetlands Policy, Estuaries Policy and the Sand and Gravel Extraction Policy.

BACKGROUND

WHAT IS A WEIR ?

A weir is a structure (including a dam, lock, regulator, barrage or causeway) across a defined watercourse that will pond water, restrict flow or hinder the movement of fish along natural flow paths, in normal flow conditions.

THE ROLE OF WEIRS

There are estimated to be over 3,000 weirs on rivers in New South Wales. In some rivers significant lengths of stream are impounded behind weirs. For example 40% of the Barwon-Darling River is in weir pools.

Most weirs were originally built to provide a reserve of water for towns or properties to carry them through dry periods. Others were built to facilitate diversion of water into effluent streams or onto floodplains to spread the productive benefits of water over a wider area. In more recent years, weirs have been built to help river operators manage releases from dams or to increase water depth for pumps and diversion channels in major irrigation developments. In a few cases weirs have been built for purely recreational or aesthetic purposes. Some weirs in the Murray River were built to improve navigation.

WHY ARE WEIRS A PROBLEM ?

Weirs have served an important role in the amenity of the towns and properties they serve, but in recent years it has become apparent that this has been at a significant environmental cost. For example:

- the still waters in weir pools are less biologically productive than natural river channels, as native species adapted to diverse and free-flowing stream conditions are disadvantaged;
- riparian vegetation is drowned in the weir pool or killed by water-logging in low-lying areas of adjoining floodplains;
- weirs act as a trap for sediments, nutrients and pollutants;

- invertebrate and detrital drift is reduced, reducing biological productivity and diversity below weirs;
- weir conditions favour water stratification in summer and the growth of algae and development of algal blooms;
- weirs obstruct native fish migration and reduce native fish populations;
- the relatively stable conditions in weir pools give alien species, such as carp, an advantage over native species;
- weir pools may affect groundwater systems by maintaining artificially high water levels, resulting in groundwater mounding;
- inundation of surrounding areas destroys flora and fauna habitat, including that of threatened species;
- weirs accumulate sediments and prevent their downstream flow, resulting in erosion and scouring downstream of the weir;
- a constant level of discharge from weirs can result in geomorphological changes to rivers, tending to make them wider and shallower; and
- weirs can alter temperature regimes down stream, resulting in an adverse impact on native flora and fauna.

Another issue is that circumstances and community needs may have changed over the years since a weir was constructed. For example, an alternative water supply may now be available and an old weir may no longer serve its original purpose. Some of these, particularly those near towns, may have developed secondary uses as recreational and visual amenities for local communities, but others are now redundant and could be removed.

A number of older weirs need major maintenance or refurbishment. Before significant expenditure is incurred, the owners and the community should consider if the cost would be better spent on an alternative supply, or significant design changes, which will reduce the environmental impact of the weir.

Because of changing circumstances and the growing awareness of the adverse impacts most weirs have on the environment, it is time to evaluate the need for existing weirs, to remove redundant weirs, to devise ways to minimise the impact of weirs retained and to critically consider any proposals for new construction.

GOAL AND PRINCIPLES

GOAL

The goal of the State Weirs Policy is to halt and, where possible, reduce and remediate the environmental impact of weirs.

PRINCIPLES

The goal is to be supported by the adoption of the following management principles:

1. *The construction of new weirs, or enlargement of existing weirs, shall be discouraged.*

2. *Weirs that are no longer providing significant benefits to the owner or user shall be removed, taking into consideration the environmental impact of removal.*

3. *Where retained, owners shall be encouraged to undertake structural changes to weirs to reduce their environmental impact on the environment.* For example:

- reducing the crest level and pool storage volume to the minimum necessary to satisfy the purposes for which the weir is required;
- modification of the weir to reduce its impact. For example, installing a larger outlet to permit the release of environmental flows or water level variation, or installing a dropboard or gated opening to allow free flow when the weir is not needed; and
- constructing a fishway or modifying an existing fishway to reduce the weir's impact on fish passage.

4. *Where retained, owners of weirs with regulatory works shall prepare and adhere to operational plans to reduce the environmental impact of those weirs.*

For example:

- achieving water level variations;
- setting minimum rates of change for discharge and storage draw-down to mimic natural changes of water level within and downstream of the weir;
- raising gates fully during any portion of the year when a weir is not needed, such as in the non-irrigation season or during significant unregulated flows; and
- raising gates at times critical to maintenance of river health, wetlands, fish etc.

5. *Where retained, gates, offtake structures and fishways on all weirs shall be maintained in good working order.*

6. *Wetlands and riparian vegetation adjacent to weirs should be protected from permanent inundation.*

7. *Areas of environmental degradation caused by the impacts of weirs upstream and downstream of weir pools, should where possible be rehabilitated.*

8. *A respect for the environmental impact of weirs should be encouraged in all agencies and individuals who own, manage or derive benefits from weirs.*

The State Weirs Policy will have three components. The first relates to the approval to build a new, or expand an existing weir. The second is a review of all existing weirs (Weir Review Program). The third addresses the provision of fishways.

APPROVALS FOR NEW OR EXPANDED WEIRS

For the purposes of this part of the policy, weir means a licensable "work" as described under the Water Act 1912, and could include any dam, lock, weir, regulator, barrage or causeway which effects the quantity or flow of water in a river or lake. This part of the policy applies to privately owned and publicly owned weirs. This does not, however, include off-river storages or farm dams on small, ephemeral streams.

Note that the State Weirs Policy does not act to the exclusion of any applicable EIA or heritage protection legislation, notably the *Environmental Planning and Assessment Act 1979*.

A proposal to build a new weir or enlarge an existing weir should not be approved unless it can be demonstrated that the primary component of the proposal is necessary to maintaining the essential social and economic needs of the affected community.

In determining the need for a new or expanded weir, the following general principles apply:

- Provision for fish passage cannot be used as a sole justification to approve a proposal to enlarge an existing weir.
- An increase in town water supply for the purposes of meeting projected population demand cannot be used as a justification to approve a proposal to build a new, or expand an existing weir, if environmentally friendlier alternatives to meeting that demand exist, which are also economically feasible.
- Provision for future industrial expansion (such as, but not limited to, tourism) cannot be used as a justification to build a new, or expand an existing weir.
- Subject to the usual EIA process, a proposal for the construction of new, or expansion of an existing weir, that will result in a net environmental benefit may be approved

(eg. this may include options to offset the impact of new or enlarged structures by the removal of existing ones).

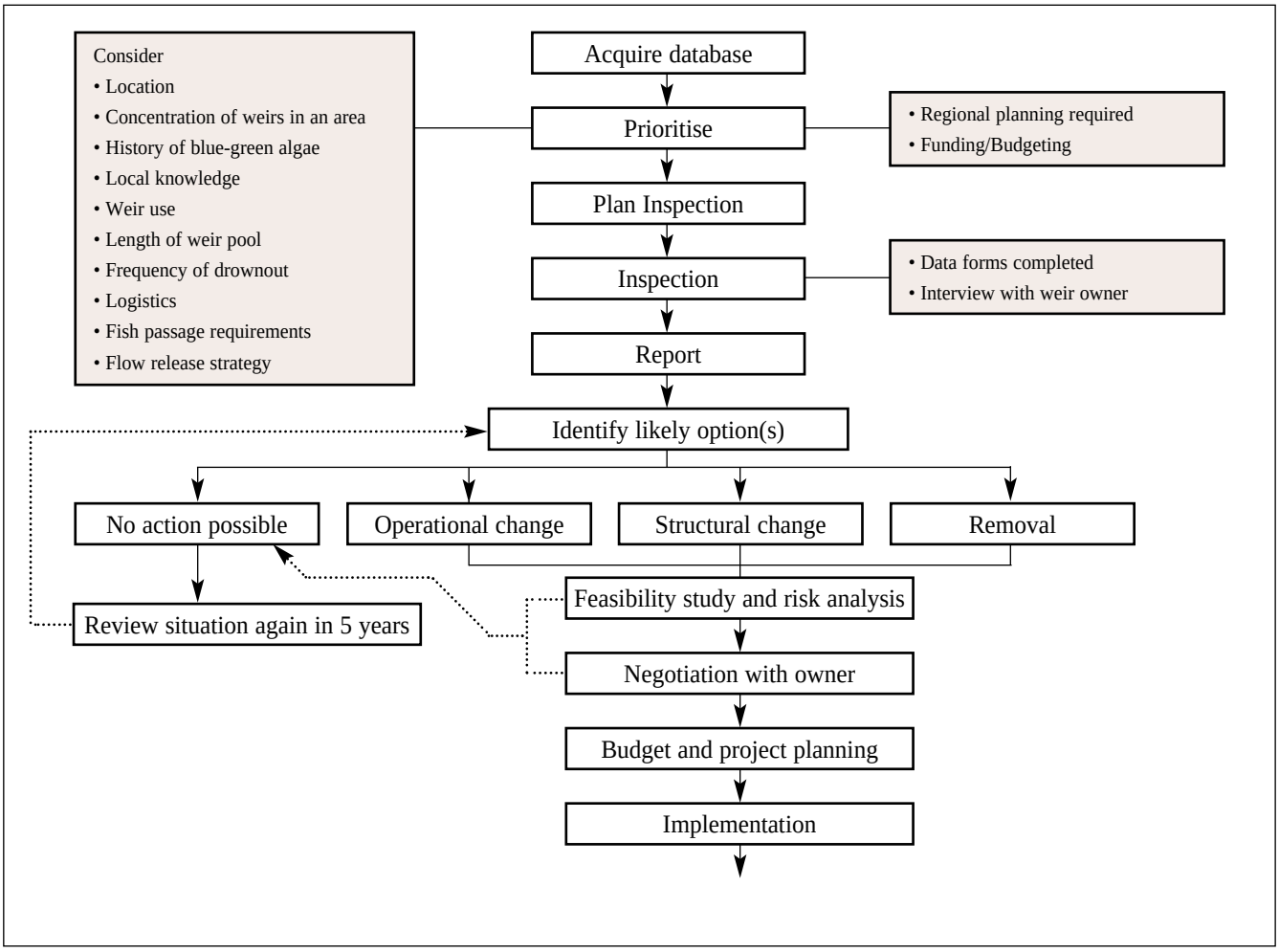
WEIR REVIEW PROGRAM

The aim of the Weir Review program is to examine the impacts of existing works and to develop a strategy which would lead to an enhanced environmental outcome. It will be achieved through undertaking an environmental audit of all weirs throughout the State, and assessing the appropriateness of the existence and/or operation of each weir, against a set of established criteria.

The review process will also cover all publicly and privately owned licensed weirs, and unlicensed weirs, including riparian rights weirs (ie those weirs not requiring to be licensed under the *Water Act 1912*) and other in-stream structures such as road crossings, which have the hydraulic effect of a weir. Information about some of these weirs and structures, especially riparian rights weirs and road crossings, will be acquired through local knowledge.

The program will be implemented in two stages - an inventory and a review stage. The inventory will provide a comprehensive database on the weirs in each region. The review stage will evaluate the environmental impact of each weir against its socio-economic value.

From the results of the review, options for modifications to a weir will be explored. These might include structural changes, changes in weir operation rules or even removal of the weir. However, weirs will not be removed or changes made without consideration of the needs of the communities they serve and the socio-economic impact of removal. Following is the process of weir review. See Figure 1 below.



WEIR IDENTIFICATION

The first step in the weir review process will be to identify the number, location, purpose and size of the weirs in each region. A Weir Inventory Database has been adapted by the Department of Land and Water Conservation (DLWC) from a database developed by the Murray-Darling Basin Commission.

The database will record information on weir ownership, mode of operation, purpose, licensing and weir type, location, structural characteristics, some hydrological characteristics and environmental data.

TRIGGERS FOR REVIEW

A review of a weir may be triggered by any of the following:

- license renewal;
- consideration of a weir for modification under the Algal Management Program;
- consideration of a weir for inclusion of a fishway;
- weirs identified as having a serious environmental impact eg. groundwater, wetlands, water quality, etc.;
- weirs whose purpose is now redundant; and
- DLWC operational structures.

LICENCE RENEWAL

Licences for weirs are renewed every five years, or ten years for town water supplies. This gives the DLWC an opportunity to ask the owner to show cause why the licence for the structure should be renewed and for additional conditions to be imposed. The process would be:

- When the renewal notice is issued, the licensee will be forwarded background information on the environmental impact of weirs and the review process, and a pro-forma requesting updated information on the weir's structure, its current use, operating rules and justification for its retention. It will be the owner's responsibility to provide this information to the satisfaction of the DLWC.
- The information will be used to update the database on weirs, and for a review of the weir by DLWC regional staff, who may also draw on expertise from other government agencies.
- If a clear need for the weir can be established and no significant adverse impacts are identified, the licence will be renewed, subject to normal licensing procedures.
- If a significant impact is apparent or no clear and strong need for the weir is identified, follow up field inspection and discussion with the owners and other interested parties will occur. This will aim to determine if:

  – the weir can be removed,
  – the weir should be modified, or
  – additional conditions should be imposed on its use.

  Where there is significant public use or interest in a weir, wider community consultation should be included in the investigation.
- On the basis of this investigation the DLWC may either refuse to renew the licence, or issue the renewal with conditions prescribing modifications or changed operating rules, or renew with existing conditions.

Weirs which are subject to licensing under the Water Act but not licensed, should be the subject of ongoing action to bring them into line with the Act's requirements. Before any licence is issued to authorise a structure, it should be subject to the same review process outlined above for renewal of existing licences.

ALGAL MANAGEMENT PROGRAM

Weirs being identified as structures of concern under the Algal Management Program shall be subject to a full review before a decision is made about an appropriate algal management strategy.

FISHWAYS

Once a weir is being seriously considered for inclusion of a fishway, a comprehensive review shall be included in the initial evaluation of the site before any significant expenditure on design or construction of a fishway is incurred.

WEIR ASSESSMENT

Each weir should be evaluated to determine the options for modification. Options may include doing nothing, weir removal, operational modifications or structural modifications such as lowering the crest height, constructing a larger diameter flow through pipe or installation of syphons, or fitting a fishway.

Consideration must be given to whether or not there is a realistic chance of effecting some change, either operational or structural on the weir. The likelihood of any action being taken must be assessed within the context of the current dependence and importance of the weir.

If it is likely that an operational or structural change, or removal may occur, a more detailed feasibility study should be undertaken and should include:

- socio-economic impact assessment of options;
- negotiation with owners/users;
- considerations regarding cumulative impacts of weirs in a locality; and
- environmental impact assessment of options including:
  – continuous impact of "do nothing" option
  – environmental benefits of options
  – environmental risks of options.

PROVISION OF FISHWAYS

Where necessary, weirs considered to have a significant impact on the movement of fish shall be formally considered for inclusion of a fishway.

The Fisheries Management Act 1994 requires that NSW Fisheries must be notified whenever a weir or any barrier to fish movement is constructed, altered or modified. If the Minister for Fisheries requests it, a fishway must be included in the design. Where the DLWC or NSW Fisheries identifies a weir as having a significant impact on the movement of fish, licensees should be advised and the weir review process commenced without waiting for the normal renewal process.

A State Government program has been established, coordinated by the DLWC and NSW Fisheries to provide adequate fish passage in rivers to ensure the maintenance of native fish stocks for species conservation, ecosystem maintenance, and economic and cultural uses. The Fishways program seeks to identify weirs which are a significant barrier to fish passage. It will also design and trial a range of structural and operational solutions for fish passage.

The fishways program is strongly linked to the Weir Review program through the Weir Inventory, which is currently being developed by DLWC. Weirs targeted by either program will automatically trigger a broader review of options, as well as specific consideration of fishway requirements.

STATE WEIR REVIEW COMMITTEE

Progress on the weir review will be reported through the existing *State of the Rivers and Estuaries* Reports, and the proposed State of the Catchment Reports. A State Weir Review Committee will be established to further develop the weir review program and to give feedback on the approval process for new or expanded weirs. This committee will be comprised of representatives of:

- DLWC Resource Management;
- DLWC Water Business;
- EPA;
- NSW Fisheries;
- NSW Agriculture;
- Local Government Association;
- Catchment Management Committees;
- NSW Farmers Association;

- NSW Irrigators Council; and
- NSW Conservation interests (eg, Australian Conservation Foundation, Nature Conservation Council).

The role of the Committee will be, amongst other things:

- to review and refine criteria for weir review;
- to review and refine criteria for approval to construct new or expanded weirs;
- to provide advice on State priorities for weir management;
- to recommend on funding priorities;
- to promote the goal and principles of the State Weirs Policy; and
- to conduct an annual audit over the implementation and performance of the State Weirs Policy.

WHOLE OF GOVERNMENT APPROACH

DEPARTMENT OF LAND AND WATER CONSERVATION

The Department of Land and Water Conservation is the agency responsible for coordinating the implementation of the water reforms. The department will work closely with the community and other government agencies to define the mix of environmental, economic and social outcomes it wants, then manage the development, use and protection of our natural resources to achieve these outcomes.

ENVIRONMENT PROTECTION AUTHORITY

The Environment Protection Authority (EPA) is leading the process for recommending to the Government interim environmental (river flow and water quality) objectives for New South Wales intrastate rivers.

The EPA will audit the achievement of environmental objectives.

NSW AGRICULTURE

NSW Agriculture is committed to helping NSW food and fibre industries and our rural communities to be economically viable and environmentally sustainable.

NATIONAL PARKS AND WILDLIFE SERVICE

The National Parks and Wildlife Service is concerned with ensuring healthy and sustainable water resources in the future, including an equitable share of water for the environment.

NSW FISHERIES

NSW Fisheries will use the findings of its NSW Rivers Survey to pinpoint areas where there are problems - especially with carp - and seek remedial action to improve conditions for native fish and fish habitat, e.g. better water quality, increased water flows and removal of impediments to flow.

HEALTHY RIVERS COMMISSION

The Healthy Rivers Commission is holding independent public inquiries into individual rivers. The Commission will recommend longer term environmental objectives for each river and strategies to achieve them.