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POLICY ON THE APPLICATION OF FISH SIZE LIMITS IN WESTERN AUSTRALIA

Department of Fisheries

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1.0 INTRODUCTION

Fisheries managers can utilise a range of different types of management tools to assist with the sustainable management of fish stocks and to achieve other fisheries management objectives. For commercial fisheries these types of tools may include input controls (e.g. a limit on the number of operators, explicit effort limits and gear restrictions) and output controls (e.g. total allowable catches, individual catch quotas) or spatial and temporal restrictions. Recreational fisheries often have daily bag limits and possession limits as quasi-output controls, while seasonal or other temporal closures can operate as input controls and be a component of limiting total fishing effort.

One of the most common forms of regulation in both commercial and recreational fisheries are size limits, which determine the size of fish which can be retained (minimum and/or maximum limits) by commercial and/or recreational fishers.

All fisheries management applied in WA (in line with the objects of the *Fish Resources Management Act 1994*) are designed to sustainably manage a stock and resource. Typically most management arrangements have other objectives in addition to sustainability (such as optimal economic outcomes in commercial fisheries and quality fishing experiences in recreational fisheries), but sustainability is always the overarching objective in any set of fishery management arrangements.

A key aspect of ensuring sustainability is to ensure that the fish stock is at a level that has sufficient reproductive capacity (e.g. spawning biomass, egg production), to enable adequate recruitment potential to the stock under normal environmental conditions. It should be noted that environmental variations can impact on the level of recruitment even if there is sufficient egg production that would enable recruitment under normal environmental conditions (noting that even normal environmental conditions have a range).

The setting of size limits is one of the oldest types of management tools used in fisheries. In many cases minimum sizes were set to ensure that fish (or a certain percentage of a fish stock) grow large enough/old enough to spawn at least once before they can be retained in order to maintain an adequate spawning potential for a stock. In other cases, minimum sizes have been used in commercial fisheries to ensure that fish are taken at a size which makes best use of the productivity of the fish stock (i.e. preventing growth overfishing) and/or to ensure that fish are landed at a size appropriate for a market. Both of these approaches assume that fish caught at less than the minimum size survive the capture process. However, for some species issues such as barotrauma, scale-loss or air exposure during post-capture handling, or predation following release, can significantly affect their post-capture survival.

Maximum size limits have sometimes been used because large fish normally have relatively higher fecundity than smaller individuals (i.e. they produce larger numbers of eggs). However, the specific merits of this approach need to be viewed in the context of the overall egg production of the stock. Maximum size limits are sometimes used in circumstances where there are sex changes with age/size, particularly where the change is from male to female and it is important to preserve egg production in the stock. Maximum size limits or limits on the number of large fish able to be retained may also have a role in achieving other management objectives, for example, ensuring large fish are protected for observation or, to promote recreational 'trophy' fishing opportunities.

Size limits set in regulations or management plans are typically applied equally across both the commercial and recreational sectors, although it is possible to implement different limits for the commercial sector (e.g. 70 mm for commercial Roe's Abalone in the metropolitan area, as opposed to 60 mm for recreational fishers) or in different areas (e.g. Pink Snapper – 500 mm in the metropolitan area and Shark Bay and 410mm in other areas).

Where a species is taken almost exclusively by one sector or the other, it is possible to 'fine tune' any size limits used in the management arrangements to the objectives for that sector. When a species is taken in both commercial and recreational fisheries the selection of a size limit may require additional consideration of, and a balance between, the relative impacts of each sector on the egg production of the stock and their management objectives. Different size limits could potentially be used for each sector, provided that the sustainability objective was not compromised or the objectives for the other sector are not unacceptably impacted.

In setting out the policy on size limits, the focus has been on providing a critical framework for ensuring that any size limit has a clear and complementary role to the other management tools being used for the achievement of the fishery management objectives for the stock/resource, fishery and sector.

2.0 POLICY OBJECTIVE

The purpose of this policy is to ensure size limits are applied in a manner consistent with the objects of the *Fish Resources Management Act 1994*.

3.0 SCOPE

This policy provides a framework for the application of size limits in recreational and commercial fishing management arrangements in Western Australia.

This policy relates to 'fish' as defined in the *Fish Resources Management Act 1994*. Among other things, fish includes crustaceans, molluscs, sharks, demersal scalefish and pelagic scalefish.

4.0 POLICY

When considering the application of size limits, the Department takes a risk-based approach that takes account of the following principles:

4.1 General

- Effective management of the effects of fishing on a fish stock is usually achieved with a range of management tools. In particular, these tools need to control overall fishing mortality (i.e. including consideration of both retained catch and post-capture discard mortality) to ensure that there is sufficient egg production to enable adequate recruitment to the stock under normal environmental conditions and, where relevant, other additional management objectives. The set of management tools developed for each stock must operate in a coordinated way which promotes the achievement of all agreed management objectives in the most efficient and effective manner.

A size limit should only be used where, after taking into consideration other management tools that are in place; it will clearly assist in providing sufficient egg production and enable adequate recruitment to a fish stock under normal environmental conditions.

4.1.1 Reproductive Strategies

- The growth and reproductive strategy of a species (single or batch spawners, high or low fecundity, sex change etc.) including the age and size at which a species typically matures and starts to reproduce (size at sexual maturity) are key elements in the consideration of the setting of any minimum or maximum size limit.
- Minimum size limits based on the size at maturity may be useful in ensuring recruits contribute to the spawning biomass in fisheries with simple management arrangements and low levels of fishing mortality.
- Maximum size limits may be appropriate where a species exhibits sex change during its lifetime, particularly where the change is from male to female. This ensures that the egg production from females is protected. Protection of large males may be important in fish stocks where there is a risk of sperm limitation.
- Some species are distributed over wide geographic areas and spawn at different sizes within the range of their distribution (e.g. Pink Snapper, Western Rock Lobster, marron). In some species, sexes mature at different sizes, while other species change sex during their lifetime.

- However, provided that the other management arrangements are sufficient to ensure adequate egg production, a size limit may be set below the size at first maturity, or it may be acceptable that there is no size limit at all.
- In circumstances of high fishing mortality or low post-discard survival (e.g. via barotrauma or depredation), the use of maximum size limits may result in limited numbers of fish growing through to the protected size class and may not be effective in achieving the desired levels of egg production if the factors causing high fishing mortality are not able to be resolved.

Reproductive strategies of species need to be closely considered in determining whether size limits are appropriate.

4.1.2 Fishing Mortality

- Fishing mortality affects the survival of fish into the spawning biomass. Ongoing high levels of fishing mortality can lead to overfishing (i.e. a reduction in spawning biomass and egg production). If not rectified, overfishing can result in the spawning biomass being reduced to the point where egg production is insufficient to provide adequate levels of recruitment (i.e. the stock becomes overfished).
- Fishing mortality has two components – fish retained after capture and fish which are not retained but die as a result of the capture, handling or discarding process (i.e. post-release/discard mortality, including post-release/discard predation by sharks).
- There is no sustainability benefit from a size limit if released fish have a low rate of post-release survival and are unlikely to contribute to the future spawning biomass.
- Post-release mortality can be influenced by gear type, fishing depth, species susceptibility to barotrauma, hooking location, handling methods and shark depredation of hooked or released fish. These factors may vary among species and fisheries which target the same species due to differences in gear used or other factors. This may require that the fishing mortality characteristics of those fisheries and the relative proportions of the fish stock which they take are given consideration in the determination of any minimum size limit.

If large numbers of undersized fish are returned to the water and a majority suffer high rates of post-release/ discard mortality, a minimum size limit may not provide significant stock sustainability benefits. In this situation it may be better to retain 'undersize' fish, provided recreational and commercial fishers don't engage in high-grading in fisheries which use bag limits or quotas. The effects of barotrauma in some species can be minimised through correct and careful handling. To assist in reducing the effects of barotrauma and maximising their chance of survival there is a requirement to have a release weight on board a boat in the West Coast Bioregion. However, even the correct use of a release weight will not ensure the survival of all fish being returned to the water, because post-release mortality rates from barotrauma typically increase when fish are caught from greater depths. Other strategies should be considered as a primary tool to reduce discard mortality e.g. stop fishing when a bag limit is reached and not targeting undesired fish. Where there is a high mortality rate of released/discarded fish, minimum size limits may not be an appropriate fishery management tool for ensuring adequate levels of egg production and sustainability. Other management controls need to be applied in these situations.

The relative proportions of a fish stock taken in a number of fisheries, and the fishing mortality characteristics associated with the fishing gear used in those fisheries, should be taken into consideration in determining whether to use a minimum size limit or in determining an appropriate minimum size limit.

4.1.3 Targeting / Retention

- If a species is generally released/discarded (i.e. it has low retention appeal or because it is a 'sport' fish) and it has low post-release/discard mortality (e.g. Samson Fish), a minimum size limit may not contribute in a meaningful way to ensuring sustainability and only unnecessarily complicate management arrangements.
- However, size limits can enhance recreational fishing experiences and create specific types of fisheries. The creation of 'trophy' fishery areas for Marron is one such example. These factors need to be considered in conjunction with, rather than in isolation from, each other.
- Limiting the catch doesn't limit fishing mortality where there is a significant level of discarding and a significant post-release/discard mortality, or where fishing continues for other species, but results in the ongoing capture and mortality of fish which are required to be released due to already achieving species bag limits or commercial quota levels.
- Changes to management arrangements, such as removing a size limit may result in changes to fisher behaviour in targeting of smaller fish. This could result in increased extractive fishing pressure on the resource.

Minimum size limits are likely to be of little value for species where the majority of fish are released/discarded; especially where targeting or fishing pressure on a particular species is low.

The focus of a fishing activity and the likelihood that the species would be retained or released/discarded needs to be considered in the application of a minimum size limit.

Size limits many be counter-productive in controlling fishing mortality in species with high post-release/discard mortality.

4.2 Social and Economic Impacts

4.2.1 Social

- Community values placed on certain fish species need to be recognised in addition to biological and fishery considerations. For example, the community may wish to afford protection to highly valued species by way of increased minimum size limits based on the social value of large fish of that species (e.g. Marron and Barramundi).
- Socially determined minimum size limits may result in a minimum size limit greater than that needed to deal with the risks to adequate levels of egg production.
- Socially determined maximum size limits or limits on the number of large fish that can be retained may be required to achieve particular social objectives, but should only be used only where the survival rate of released/discarded, larger fish is high.
- Where species are similar in appearance and have comparable biology, consideration needs to be given to having common size limits to simplify fishing rules and aid in compliance. This may require a degree of compromise in the size limit which is set.

Higher minimum size limits, maximum size limits or limits on the take of larger fish may be required for some species to achieve social objectives.

Common minimum size limits are desirable for species with comparable biology and/or similarities in appearance to simplify the rules and aid compliance.

4.2.2 Economic

- Maximising economic returns is a primary driver for the commercial fishing sector. In maximizing the profitability of commercial fishing operations, the commercial sector may seek to retain fish of a certain size in accordance with market demand and/or to reduce wastage of discarded fish which have low post-capture survival. This may require consideration of different size limits applying to the commercial sector for some species. Provided this does not detract from achievement of the sustainability objective or impact unacceptably on the achievement of recreational management objectives, then different size limits could be considered for the different sectors.

- Recognising the economic return to the community from the use of a resource is also a factor in determining how each sector utilises the resource.

Different size limits can apply to the commercial sector for the purpose of achieving economic objectives provided that they do not detract from the achievement of the sustainability objective or unacceptably impact on recreational management objectives.

5.0 GLOSSARY

Barotrauma is the term used for a range of physical injuries caused by the expansion of gases inside a fish's body when it's unable to adjust to changes in water pressure as it is brought to the surface.

Fish means an aquatic organism of any species as defined in the *Fish Resources Management Act 1994.*

Growth overfishing occurs when fish are harvested at an average size that is smaller than the size that would produce the maximum yield per recruit.

High grading refers to the practice of returning a fish to the water if a larger or more valuable fish is available for retention.

Recruit a fish that survives through the early developmental and growth stages to become part of the fish stock exploited by the fishery.

Recruitment the addition of recruits to the exploited fish stock by reproductive processes.

Size at maturity means the size at which 50% of fish have reached sexual maturity (noting that, due to natural variation, fish within a population will mature sexually at sizes greater and less than this).

Spawning biomass means the component of a stock or population capable of reproducing.

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