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The aquaculture of non-endemic species in Western Australia

Silver Perch **(*Bidyanus bidyanus*)**

By Tina Thorne & Heather Brayford

Fisheries management paper no. 145

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1. BACKGROUND

For a number of years silver perch, a species native to the Murray-Darling river system of eastern Australia, has been allowed into Western Australia for the purpose of stocking rural, inland farm dams. Imports have only been allowed under licence, subject to disease-free certification and on the basis of fish being placed into impounded waters. In recent times, there has been considerable interest in furthering the development of commercial aquaculture of this species.

The development of commercial aquaculture of a non-endemic species such as silver perch raises a number of important issues relating to translocation. These include the potential of the introduced species to:

- impact on genetic diversity;
- introduce disease; and
- impact on
 - the natural environment; and
 - the biodiversity of native species.

This Management Paper has been drafted in liaison with the Department of Environmental Protection in accordance with the principles of risk assessment, taking into account the above issues. It is considered that the implementation of this policy will protect the natural environment and native fish species. It will also allow for the development of a silver perch industry and provide the first step towards self-regulation of that industry.

It should also be noted that the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* came into effect on 16 July 2000. Under this legislation, certain actions may require approval from the Commonwealth Environment Minister.

The requirement for approval is triggered by an action which has, or will have, or is likely to have, a significant impact on a matter of national environmental significance. The matters of national environmental significance identified in the Act as triggers for the Commonwealth assessment and approval regime are:

- World Heritage properties;
- Ramsar wetlands;
- Nationally threatened species and ecological communities;
- Migratory species;
- Commonwealth marine areas; and
- Nuclear actions.

Further information with respect to this issue can be found on the following website:
<http://www.environment.gov.au/epbc>

2. OBJECTIVES

This Management Paper is intended to assist the Executive Director, when considering the issue of authorisations for aquaculture purposes under Section 92 of the *Fish Resources*

Management Act 1994, to allow for the continued development of a silver perch industry in Western Australia in an environmentally acceptable manner,

The Paper details:

- a) the areas within Western Australia that commercial and non-commercial aquaculture of silver perch may or may not be permitted;
- b) the suitability of properties within Western Australia to commercially or non-commercially farm silver perch;
- c) the manner in which licensed silver perch farmers can sell product; and
- d) the manner in which adult and juvenile silver perch are imported into Western Australia.

3. POLICY

Silver perch aquaculture is permitted in Western Australia in accordance with the following principles:

(a) Approved Areas

The areas in which commercial and non-commercial silver perch farms can be located are categorised according to criteria relating to the environmental impact on the particular drainage basin in which the water body to be stocked is located.

The criteria are as follows:

- The conservation status of the rivers and streams with the drainage basin or areas within the drainage basin as determined by the ranking assigned them by the Waters and Rivers Commission.
- The drainage basins, or areas within the drainage basin that contain threatened or restricted aquatic native species (see Attachment 5).
- The probable range of silver perch within Western Australia and suitability for aquaculture.

Drainage basins in Western Australia are categorised as:

CATEGORY 1: Drainage basins, or areas within drainage basins in which commercial and non-commercial silver perch farms are not permitted

CATEGORY 2: Drainage basins in which commercial and non-commercial silver perch farms may be permitted, subject to conditions

CATEGORY 3: Drainage basins in which commercial and non-commercial silver perch farms will be permitted, unless otherwise indicated by the Executive Director of Fisheries Western Australia

Commercial and non-commercial aquaculture of silver perch is not permitted in any National Parks, Conservation Parks, Nature Reserves, State Forests or 'A' and 'C' Class Reserves.

(b) Non-commercial Aquaculture

The translocation of silver perch from licensed farmers to private properties for non-commercial aquaculture is only permitted where the private property is within a Category 2 or 3 drainage basin.

However, proponents within a Category 2 area who wish to stock silver perch for non-commercial purposes will be required to provide details of the property to be stocked as required in the information sheet (Attachment 4). Fisheries WA, based on the information provided, will determine whether the proponent at their expense, will be required to arrange for an independent inspection of their property. Guidelines for this inspection will be provided.

(c) Commercial Aquaculture

Applicants for an **Aquaculture Licence** for a property within a Category 2 area will be required to have their properties inspected to assess the level of risk of escape and the proximity of the property to environmentally sensitive areas or river systems. The inspection could be performed by;

- an Officer of Fisheries WA (a fee may apply for the inspection); or
- an approved person/consultant at the proponent's expense. (A list of suitable consultants is available from Fisheries WA).

Licensed silver perch farmers operating on approved properties are permitted to sell product as:

- processed product;
- live product direct to wholesale and retail outlets for human consumption;
- live product direct to the export market;
- live product to other silver perch farmers with an aquaculture licence;
- required for non-commercial aquaculture in accordance with item (b) above;
- otherwise authorised in writing by the Executive Director of Fisheries WA;
- licensed silver perch farmers may be permitted to sell juvenile fish for aquarium purposes. (Conditions apply. Please contact Fisheries WA for further details).

(d) Importation

Juvenile

The importation of juvenile silver perch, from eastern states hatcheries destined for non-commercial aquaculture requires the authorisation of the Executive Director of Fisheries WA.

The importation of juvenile silver perch from eastern states hatcheries by licensed silver perch farmers is permitted on a case-by-case basis. In accordance with the *Fish Resources Management Regulations 1995* Regulation 176, the importations are subject to the approval of the Executive Director of Fisheries WA and appropriate disease-free certification. The protocol for disease-free certification is shown in Attachment 3.

Broodstock

The importation of silver perch specifically for broodstock purposes by silver perch farmers with an aquaculture licence is permitted on a case-by-case basis. The importations are subject to the approval of the Executive Director of Fisheries WA and appropriate disease-free certification. The protocol for disease-free certification is shown in Attachment 3.

(e) Existing Licences

Licences for silver perch issued prior to the implementation of this policy may remain in force, with any special conditions to be considered as relevant. This may necessitate a property inspection.

ATTACHMENT 1

SILVER PERCH AQUACULTURE

CATEGORISATION OF DRAINAGE BASINS

CATEGORY 1:

Drainage basins, or areas within drainage basins in which commercial and non-commercial silver perch farms are not permitted

SOUTH-WEST DIVISION	
DRAINAGE BASIN	BASIS OF DECISION
Albany Coast (602) Fitzgerald, Hamersley and Steere Rivers Kelly's Creek, Boondadup, St Mary and Lake Nameless Rivers Waychinicup, Little Bluff, Cordinup, Wilyunup and Eyre Rivers Goodga and Angove Rivers	<ul style="list-style-type: none"> Principal rivers of the Fitzgerald National Park. Key systems with respect to managing the Fitzgerald Biosphere Small, near pristine systems High conservation habitat with a number of permanent freshwater pools, mostly closed inlets or coastal lagoons Connected to number of lakes that support a disjunct population of the restricted fish: the trout minnow. Conservation status of these lakes is high
Denmark Coast (603) Kent River (604) Frankland River (605) Shannon River (606) Warren River (607) Donnelly River (608)	<ul style="list-style-type: none"> These basins contain a number of restricted fish species that are particularly vulnerable to the introduction of non-native species (i.e. Salamander fish, Black-striped minnow, Western mud minnow and Balston pygmy perch) CALM reserves and National Parks of high conservation value make up a large percentage of the land area. These basins contain river systems with high conservation-status tributary streams. One river (Deep), is almost wholly enclosed in a naturally vegetated area. Others are connected to high conservation-status wetlands of the coastal plain.

TIMOR SEA DIVISION	
DRAINAGE BASIN	BASIS OF DECISION
Cape Leveque Coast (801) Fitzroy River (802) Lennard River (803) Isdell River (804) Prince Regent River (805) King Edward River (806) Drysdale River (807) Pentacost River (808) Ord River (809) Keep River (810)	<ul style="list-style-type: none"> Although seasonal, the river systems in these basins are considered to be of a high conservation value. Pristine permanent and semi-permanent pools exist in the stream beds of most river courses. These basins are within the Leichardtian fluvial region which contains the richest inland faunal region in Australia in terms of species diversity. They also contain a number of species of fish that could be considered vulnerable, although insufficient information is available. These include the Drysdale hardyhead, Prince Regent hardyhead, Pygmy rainbowfish, slender gudgeon and the Barnett River gudgeon. High water temperatures experienced in this area indicate that it is unlikely that silver perch is would be a suitable species to farm.
Sandy Desert Basin (025) Mackay Basin (026)	<ul style="list-style-type: none"> High water temperatures experienced in this area indicate that it is unlikely that silver perch would be a suitable species to farm.

CATEGORY 2:

Drainage basins in which commercial and non-commercial silver perch farms may be permitted, subject to conditions

Proposed commercial and non-commercial silver perch farms in these basins may be subject to a full property inspection and evaluation as part of the decision making process. Those drainage basins marked with an asterisk (*) contain areas or rivers and streams of high conservation value (see listing at Attachment 2) or contain restricted native fish species (see listing at Attachment 5). The proximity of farms to these high conservation areas will be taken into consideration when farms are assessed for approval.

SOUTH WEST DIVISION	
<i>DRAINAGE BASIN</i>	<i>BASIS FOR DECISION</i>
Esperance Coast (601)* Albany Coast (602) Blackwood River (609)* Busselton Coast (610)* Preston River (611) Collie River (612)* Harvey River (613)* Murray River (614)* Swan Coastal (616)* Moore-Hill Rivers (617)*	<ul style="list-style-type: none"> • Basin 602 supports a disjunct population of the restricted species Trout minnow. • These basins are considered to be of moderate conservation value and placed into category 2 owing to the large number of sensitive areas, CALM Reserves or National Parks contained within them.

INDIAN OCEAN DIVISION	
<i>DRAINAGE BASIN</i>	<i>BASIS FOR DECISION</i>
Greenough River (701)* Murchison River (702) Wooramel River (703) Gascoyne River (704) Ashburton River (706) Onslow Coast (707) Fortescue River (708) Port Hedland Coast (709) DeGray River (710) Lyndon Minilya River (705)*	<ul style="list-style-type: none"> • The conservation status of these drainage basins is difficult to determine due to a lack of information • There is very little high quality stream habitat in these basins, but it is important to protect those areas that appear to be in relatively un-degraded condition • Contains two threatened species: the Blind cave gudgeon and the Blind cave eel
Nullabor Basin (022) Warburton Basin (023)	<ul style="list-style-type: none"> • The conservation status of these drainage basins is difficult to determine due to a lack of information. • High water temperature experienced in these areas would indicate that it is unlikely that silver perch would be a suitable species to farm.

CATEGORY 3:

Drainage basins in which commercial and non-commercial silver perch farms will be permitted

SOUTH WEST DIVISION	
<i>DRAINAGE BASIN</i>	<i>BASIS OF DECISION</i>
Avon River (615) Yarra Yarra (618) Ninghan (619)	<ul style="list-style-type: none"> • Mostly wheatbelt areas. Degraded with few permanent river systems of high or moderate conservation value
Salt Lake Basin (024)	<ul style="list-style-type: none"> • High water temperature experienced in this area would indicate that it is unlikely that silver perch would be a suitable species to farm.

ATTACHMENT 2

SILVER PERCH AQUACULTURE

LISTINGS OF SENSITIVE AREAS OR RIVER SYSTEMS WITHIN THE CATEGORY 2 DRAINAGE BASINS

Note: For the purposes of this table, high quality is defined as being relatively pristine

<i>DRAINAGE BASIN</i>	<i>AREA</i>	<i>REASON</i>
SOUTH WEST DIVISION		
Esperance Coast (601)*	Jerdacuttup River	High conservation value and large lake system at the base of the system
Blackwood River (609)*	Donnelly River	Contains a number of high conservation status streams that link via Lake Jasper to the most important fish habitat in the south west, the Scott Coastal Plain and the D'Entrecasteaux National Park.
	Blackwood River below Nannup	Many high quality tributaries
Busselton Coast (610)*	Ludlow, Sabina and Margaret Rivers	Headwaters of these rivers have high conservation value
Collie River (612)*	Collie River above the Harris River Dam and Wellington Dam	High quality stream system associated with wetland habitat
Harvey River (613)*	Harvey River above Drakes Brook, Samson Brook, Logue Brook and Stirling Dams.	High quality stream systems
Murray River (614)*	North and south Dandalup Rivers above the dams	A number of high quality stream systems
	Serpentine River above the Serpentine Dam	A number of high quality stream systems
Swan Coastal (616)*	Canning River above the Canning Dam	A number of high quality stream systems
	Helena River-Beracking Brook above the Mundaring Weir	High conservation value
Moore-Hill Rivers (617)*	Gingin Brook	Somewhat degraded but is a unique spring fed system which flows permanently with high quality. Supports several restricted fish species
	Moore River north of the Moore River National Park	Contains some high conservation value short tributaries
	Nambung River, upper tributaries in Crown Land	High conservation value
	Nambung River, lower reaches	Connect to wetlands of high conservation value
	Mingulo and Mullering Brooks, lower reaches	High conservation value and connect to wetlands
	Hill River, lower reaches below the Brand Highway	High conservation status
	Cockleshell Gully	The only near pristine system left between Perth and Geraldton. Connects with coastal wetlands
INDIAN OCEAN DIVISION		
Greenough River (701)*	Arrowsmith River, lower reaches	High conservation status
Lyndon Minilya River (705)*	Gnamma Hole and Mowbowra Well	Contain a population of the restricted species: Blind cave eel

ATTACHMENT 3

SILVER PERCH AQUACULTURE

SILVER PERCH DISEASE PROTOCOL

Interstate translocations

When considering the disease implications of the interstate translocation of silver perch, the main disease of concern to Western Australia is epizootic haematopoietic necrosis (EHN) virus, as Western Australia appears to be free of this disease.

Option 1

Fish may be imported from hatcheries with a documented history of freedom from EHN. Any certification provided must be based on a minimum of two years testing by a recognised State Government Laboratory using appropriate fish health techniques.

Option 2

If the fish to be imported are to be sourced from a hatchery that cannot provide appropriate health certification from the state of origin, then testing must be carried out by the Fish Health Section of Fisheries WA under the protocol outlined below, prior to importation.

Fish Health Testing Protocol

Juvenile fish

A sample of 300 fish from the batch to be imported is required for the testing protocol. Each batch of fish must be numbered and kept in isolation until the testing is completed:

- Tissues from 150 fish are used for virological screening by inoculation on to standard tissue culture cell-lines,
- a further 150 fish are subject to parasitological and histological signs of disease and pathogenic organisms.

A sample size of 150 fish is an internationally accepted standard size. It is based on sampling a population of at least 10,000 fish and gives a probability of 95% of finding a pathogen in the sample if 2% or more of the sampled population are infected. Provided the testing is performed by qualified personnel, it is also assumed that the testing procedure is 100% reliable.

Provided the cell culture and the histology results are negative, certification of the batch is issued. The certification is specific for the particular batch of fingerling fish tested from the specified hatchery and remains current for six weeks. Should the certification expire before the fish are to be imported, the fish will be required to be re-tested.

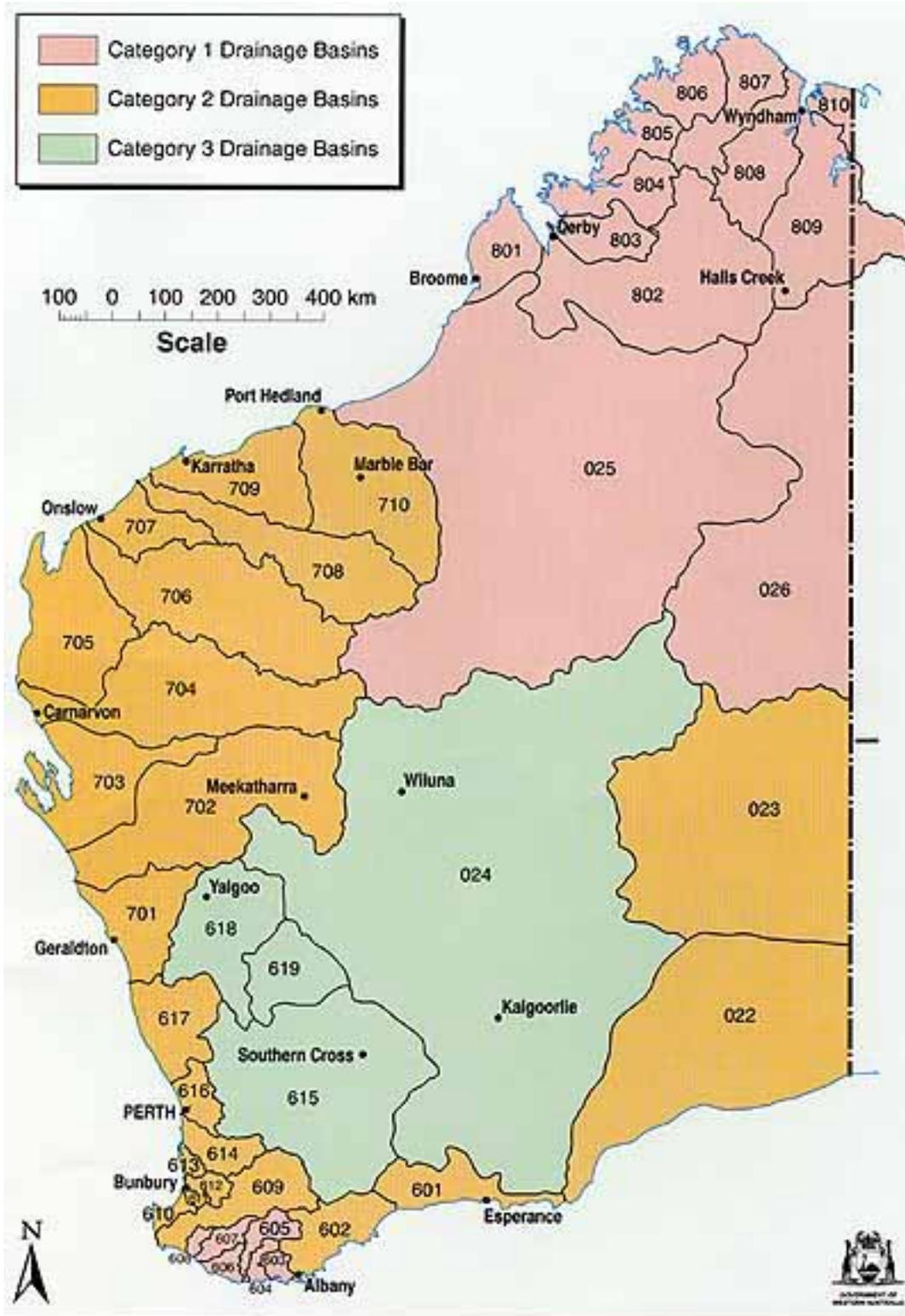
Broodstock fish

Adult fish imported into Western Australia for broodstock purposes will be required to be held in a quarantine facility approved by the Senior Fish Pathologist of the Fish Health Section. The fish can be spawned and a sample of 300 of the F1 progeny will be tested by the protocol outlined above. The remaining adult broodstock **may** then need to be destroyed. If the broodstock are not destroyed, they will not be released from quarantine unless otherwise authorised in writing by the Senior Fish Pathologist.

Transfers within the State

Currently, there are no requirements for testing silver perch that are transferred within Western Australia. Should it be considered necessary to do so in the future, then a similar protocol as outlined for interstate transfers could be used. A further option is to establish a system of regular sampling of local hatcheries to provide 'specific pathogen-free' or 'high health' status for hatcheries.

Routine inspections and sampling of hatcheries to provide 'specific pathogen-free' or 'high health' status are now common in Europe. Negative results from testing carried out over at least two years must be obtained before the 'specific disease-free' or 'high health' status is acknowledged. The adoption of a similar system in Western Australia which is internationally recognised would greatly improve confidence in the disease-free status of the stocks, which would in turn aid exports.



ATTACHMENT 4

SILVER PERCH AQUACULTURE

PROPERTY INSPECTION FOR THE COMMERCIAL AND NON-COMMERCIAL FARMING OF SILVER PERCH

PROPERTY DETAILS		
Name of Property Owner:		
Address of Property:		
Telephone ☎:	Facsimile:	E-mail

Please append maps, diagrams or any details necessary to support the assessment

PURPOSE OF STOCKING			
Non Commercial / Commercial aquaculture:			
If commercial, does the property owner possess an Aquaculture Licence?			
If so, Licence Number:			
SITE DESCRIPTION			
In which drainage basin does the property lie?			
Category of this drainage basin:			
Proximity of property to any 'sensitive areas' within that drainage basin:			
Culture Method (please circle)	Tanks	Dams	Ponds
Describe water intake and outlet:			
Is the water outlet fitted with a screen suitable to prevent fish escape?			
Describe Screen:			
Proximity of the dam/pond to rivers and streams:			
Name of closest river or stream:			
SOURCE OF STOCK			
Name Supplier			
Address Supplier			
Size of Fish			

**PROPERTY INSPECTION FOR THE COMMERCIAL AND NON-COMMERCIAL
FARMING OF SILVER PERCH**

APPROVED	NOT APPROVED
-----------------	---------------------

Comments/Conditions:

DETAILS OF INSPECTION	
Performed by	
Name:	
Company:	
Address:	
Telephone ☎:	Facsimile:
Date:	
Signature:	

DIAGRAM OF PROPERTY

<p>Name and Address of applicant : _____ _____ _____</p> <p>Attach a map, or draw one in the space provided below, illustrating:</p> <ul style="list-style-type: none"> • the location of the property where the silver perch will be stocked; • the location of the ponds/dams/tanks where silver perch will be stocked; • the distance from and names of any natural waterways, winter creeks, roads; • the direction in which water would flow should the dam overflow in a flood; and • any screening systems in place to prevent fish escaping.
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ATTACHMENT 5

SILVER PERCH AQUACULTURE

LIST OF WESTERN AUSTRALIAN NATIVE FISHES OF HIGH CONSERVATION VALUE

Scientific name	Common name	Status
<i>Lepidogalaxias salamandroides</i>	Salamander fish	Restricted
<i>Galaxias truttaceus</i>	Trout minnow	Restricted *
<i>Galaxiella nigrostriata</i>	Black-stripped minnow	Restricted **
<i>Galaxiella munda</i>	Western mud minnow	Restricted **
<i>Nannatherina balstoni</i>	Balston pygmy perch	Rarest endemic **
<i>Milyeringa veritas</i>	Blind cave gudgeon	Rare
<i>Ophisternon candidum</i>	Blind cave eel	Vulnerable

* Most restricted fish in the south west (Isolated pocket at Two Peoples Bay)

** Isolated population at Gingin