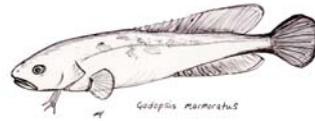


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## Project report

**Ref: R208-01**

**11<sup>th</sup> December, 2008**

**To:** Murray-Darling Basin Commission  
Research Program Coordinator  
Native Fish Strategy

*MD1063 Securing the southern purple-spotted gudgeon in the Southern Murray  
Darling Basin: establishing captive maintenance*

### 1. Background

Critically low water levels in the Lower River Murray below Blanchetown, caused by a combination of record low Murray inflows and water abstraction, have eliminated much habitat for small native fishes, including the only known southern MDB habitat of the southern-purple spotted gudgeon (SPSG). A rescue operation was undertaken in early 2007 as an urgent conservation measure as wetland drying occurred. Prior to the inception of this project 50 adult fish were housed in a makeshift facility run essentially by in-kind contributions from individuals (with government approval) (see Hammer 2007 and recent NFS workshop). This project sought to secure the captive population by developing a more sustainable program - for both fish and researchers.

### 2. Project Objectives

To secure southern MDB SPSG by:

- (a) Establishing a suitable facility to maintain and spawn rescued fish.
- (b) Developing support structures and options for species recovery including a greater awareness of the plight of threatened MDB fishes.

### 3. Project Deliverables

1. OH&S risk assessment and safety plan.
2. Small-scale tailored fish hatchery.
3. Produce fry for establishing refugia.
4. List of potential refuge locations.
5. Final report on husbandry, breeding success and potential refuge sites.

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## 4. Project reporting

### Deliverable 1

An 'Occupational Health and Safety Plan' for the Aquasave Freshwater Fish Captive Maintenance Facility was developed in January 2008 to the satisfaction of State legislation and review of the MDBC. It is subject to ongoing review, with the basic elements outlined below. The full document is attached.

1. Undertake a Hazard Assessment Form (Table 1) which identifies all hazards in the facility, assess the risk associated with these hazards, and details measures for implementation to eliminate or control risks.
2. Get this initial Assessment Form reviewed (PIRSA/MDBC) and then implement the controls in operation of the facility.
3. Detail and maintain safety equipment necessary to implement controls (Table 2), undertake a workplace safety check on initiation of operation (Small Business Safety Solutions document).
4. Maintain and update emergency procedure signage (Figure 1).
5. Maintain an OH&S logbook and other records documenting accidents and near misses for incorporation into the Hazard Assessment form.
6. Implement regular SAFE hazard management checks (Small Business Safety Solutions document).
7. Implement preventative maintenance of electrical equipment and infrastructure.
8. Undertake annual review of the Hazard Assessment form involving the proprietor, colleagues and all assistants, and consulting advice on the Safework SA website ([www.safework.sa.gov.au](http://www.safework.sa.gov.au)).
9. New assistants are to be inducted with a tour highlighting hazards, signage, and safety equipment and briefed on the Hazard Assessment Form (copy provided to person) and accident reporting.
10. All person involved in running the facility are to have input to the OH&S Plan, especially the Hazard assessment and control process.

### Deliverable 2

The major project task was to plan and build a small-scale tailored maintenance facility for SPSG. The facility was completed and operational at the start of November 2008, although most fish were on site earlier than this. Features of the facility include:

1. Energy efficient, temperature controlled room, 6.5x 3.5m; thickly insulated walls, insulated panel roof, sealed edges and reverse cycle air-conditioner.
2. Sixteen 200 L broodstock holding aquaria, six 100L fry rearing/quarantine aquaria and fry rearing tubs.
3. Air powered filtration with constant power supply backup.
4. Full electrics including appropriate lighting.
5. Safe chemical storage, food store and plumbed waste water system recycled for garden use.

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**BEFORE – initial makeshift facility (photo courtesy M. Lintermans)**



**AFTER – MDBC funded Aquasave fish maintenance facility**





### Deliverable 3

The production of fry is now achievable within the facility and has been successfully undertaken opportunistically (and can be undertaken at a large scale on demand). Spawnings have been ongoing on since the start of spring, although there is still a need for a location to stock the fry (searches continue). An immediate priority developed as the need to spawn older fish to produce fry as a genetic backup to the selected broodstock and maintain these for succession into the breeding program as required.

To date several key older fish have been spawned and fry are now being held at controlled aquaria locations. The below table highlights current holdings of first generation (F1) fish spawned from the captive pairs. This indicates fish ID numbers and covers key older fish in the facility. A public display was established by SA DEH at Cleland Wildlife Park, with a large aquarium for Lower Murray PSG. Fish from the hatchery were supplied as display but also as a part of the broodstock backup. Alberton Primary School has recently developed a facility to care for juveniles as an educational and conservation program in partnership with Aquasave and Healthy River Australia (10 x 200L aquariums each holding selected juveniles to backup older broodstock at the hatchery). The project is being launched in early February. Other fish are held with staff of the SA Museum, SARDI and in the hatchery.

Hatch	Male	Female	Batch	n	Location	Status
MH batches						
29/10/07	LM34	LM19	F1LM34xLM19F	2	SA Museum	Juveniles
18/12/07	LM22	LM23	F1LM22MxLM23F	20	MH	Juveniles
18/12/07	LM22	LM23	F1LM22MxLM23F	10	Alberton	Juveniles
23/01/08	LM7	LM18	F1LM7MxLM18F	15	Cleland	Juveniles
23/01/08	LM7	LM18	F1LM7MxLM18F	4	Alberton	Juveniles
18/02/08	LM15	LM16	F1LM15MxLM16F	6	Alberton	Juveniles
19/12/08	LM17	LM18	F1LM17xLM18F	100	MH	Fry
19/12/08	LM17	LM18	F1LM17xLM18F	100	Alberton	Fry
26/12/08	LM7	LM8	F1LM7MxLM8F	50	MH	Fry
26/12/08	LM7	LM8	F1LM7MxLM8F	50	Alberton	Fry
19/12/09	LM13	LM14	F1LM13MxLM14F	75	MH	Fry
19/12/09	LM13	LM14	F1LM13MxLM14F	75	Alberton	Fry



Public  
aquarium  
display at  
Cleland

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#### Deliverable 4

Given the prevailing climatic conditions, the location of ex-situ refuges has proven difficult, with most suitable locations in natural habitat remaining dry. Communication has been made with local agencies (PIRSA, DEH, SAMDBNRMB, Waterfind) and the process is ongoing. Re-stocking wild locations will require extensive risk assessment and liaison with PIRSA Fisheries and is unlikely in the short-term (J. Higham pers. comm.).

Key partnership with Waterfind Environment Fund (now Healthy River Australia) resulted in several press releases calling for suitable farm dams. This list was developed and assessed by the SA Department for Environment, with input from Aquasave regarding criteria and suitability, and has so far resulted in stockings of MDB Yarra pygmy perch. It is hoped that locations for SPSG fry will soon be located (contact Arkellah Hall, [hall.arkellah@saugov.sa.gov.au](mailto:hall.arkellah@saugov.sa.gov.au)). Dams at this stage will be located in the Eastern Mount Lofty Ranges, part of the southern MDB.

#### Deliverable 5

This report acts as the final report and hence deliverable. A brief hatchery management plan is being developed and will incorporate information on current setup, methods and lessons included from this project.

#### Others outcomes and future options

The current project effectively secured a working environment for conservation of an icon species, and built capacity to move forward with conservation. Long-term success will ultimately be measured by return and re-establishment of wild habitat, which faces an uncertain future under current scenarios. A stepping stones approach to establish sustainable ex-situ populations as a stocking source is seen as the best way forward, and the ability to stock larvae has now been developed.

The project, although small, has received notable promotion at public events including the Native Fish Strategy Forum. There has been brief mention of the captive breeding program in newspaper articles, but nothing dedicated about the hatchery so Aquasave is happy to work with the MDBC on media opportunities to help increase awareness of the project and native fishes.

The project sought expertise from a range of sources to successfully establish the hatchery and develop the setup for holding and breeding broodstock. In addition to drawing on lessons from the makeshift facility regarding tank size, stocking density and fish health/care, key input in setup came from Glen Brigs from Bayfish (flown over for a meeting from Melbourne through this project), fish health experts at PIRSA, consultations with the local branch of ANGFA and visiting the NSW Fisheries hatchery at Narrandera (funded by SA DEH).

The current project established a working facility, but ongoing costs remain with running and maintenance. The SA Government is currently developing a 'Drought Action Plan' dealing with urgent conservation measures for Lower Murray fishes and it is anticipated that future maintenance costs will be born by this project.