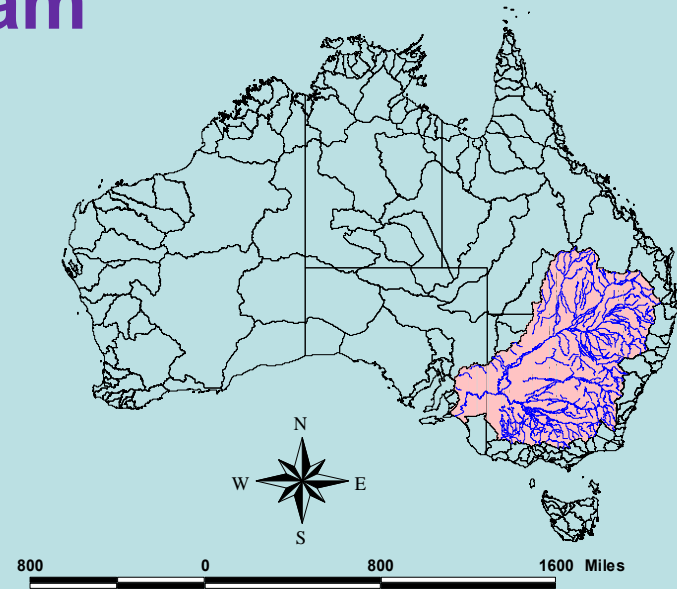




Together, create and apply solutions

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Freshwater Products and Strategies Program



Major objective:

To develop an Integrated Pest Fish Management Plan for the Murray Darling Basin

Program Leader - Wayne Fulton
Program Coordinator - Kylie Hall



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Components of an IPFM Plan

Prevention/Detection/Education

- prediction, surveillance, early warning
- rapid response
- community education

Control options/techniques

- **Bio-control**
 - genetics
 - disease
 - predation/competition
- **Chemical control**
 - biocides/piscicides
 - attractants/repellants
 - disruptors
- **Mechanical/physical control**
 - containment technologies eg screens, barriers, deflectors
 - capture/removal methods
 - traps
 - fishing
 - » commercial recreational
 - » targeted programs
 - » methods (electrofishing, netting)
 - » support tools (radio tracking etc)



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Components of an IPFM Plan (cont.)

Target information

Species specific information

- distribution, abundance
- behaviour
- population dynamics (age growth recruitment, mortality, modelling etc)
- movement, migration
- habitat relationships
- vulnerability assessment
- monitoring

Support framework

Policy/economics/risk

- legal implications (GM's, state boundaries etc)
- cost benefit
- biological risks

Education/community engagement

- this program
- other programs
 - education
 - uptake/demonstration



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Specific projects yrs 1-3

- **Detection /prevention**
 1. **Generic rapid response to new pest fish invasions;** ARI Vic
- **Control options**
 2. **GM carp;** Thresher CSIRO Hobart
 3. **Koi Herpes Virus assessment;** Crane CSIRO AAHL Geelong
 4. **Biocide evaluation;** PIRVic Aust.
 5. **Sensory attractants for pest fish control;** Sorensen U Minn USA, PIRVic Aust
 6. **Screening and isolation of environmental attractants;** Rochfort PIRVic, Barrow ANU
 7. **Trapping technologies;** Smith SARDI
- **Target species information**
 8. **Carp reproduction hotspots in MDB;** Gilligan NSW Fisheries Narrandera
 9. **Carp movement in MDB;** Brown DPI Victoria
 10. **Carp population dynamics**
 - **population modelling;** PirVic, CSIRO
 - **age validation in northern MDB;** Hutchison QDPI
 11. **Tilapia population status and pop. dynamics;** Russell QDPI
- **Support Framework**
 12. **GM policy - evaluation of implications;** Fulton DPI Vic
 13. **Community education and engagement;** Adrian Wells, Murray Darling Assoc
 - **Education and demonstration - other programs**



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Other Programs

Education - PhD students

Gwilym Haynes	USYD	Population genetics of carp in the MDB
Aaron Elkins	ANU	Identifying and isolating natural environmental attractants for common carp control
Lindsey McFarlane	UQ	Regulation and manipulation of sex in the carp <i>Cyprinus carpio</i> (L) - Eploring RNAi and microRNA pathways
Katie Doyle	UQ	Impact of increased predator presence through stocking on carp populations and the implications for management

Uptake

- 1. Carp control in the Logan Albert Catchment** - Andrew Norris, Michael Hutchison QDPI&F
- 2. Identifying and implementing targeted carp control options for the Lower Lachlan Catchment** - Dean Gilligan NSW DPI



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Sensory attractants and carp control

This group of projects revolves around the theme of firstly identifying natural patterns in carp movement and migration that may be used to enhance capture

- **carp hotspots**
- **spawning migrations & attractant flows**

Secondly seeing if we can enhance these patterns or aggregations in some way to facilitate removal by use of attractants

- **screening for environmental attractants**
- **development of sensory attractants**



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Status of attractants projects

Environmental attractants.

This project is designed to look at sensory attractants from the environmental side.

- **Is there a chemical cue in the environment that is specifically attracting the fish?**

Initial work is concentrating on trialling the methods for extraction and concentration and then for analysis.

- **Using water samples from Banrock Station project at present.**
- **Will also use water from Lake Sorell in Tasmania in association with IFS.**



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Status of attractants projects

Pheromones

Lab work has confirmed;

- **Sexually receptive female carp can be strongly attracted to a male-derived pheromone.**
- **Ovulated female goldfish release a stimulatory and attractive pheromone that attracts male goldfish (will be repeated for carp).**
- **Both pheromones can be extracted using resins.**
- **Can attract carp to food odours, can enhance this attraction using flows.**

Peter Sorensen's work in Minnesota is now undertaking field trials in a 100ha lake that contains a known density of carp including radio-tagged fish.

- **Been able to strongly attract carp using carp-specific baits**
- **About to trial the pheromones**



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Use in control projects

- **Feeding the results back into actual field trials;**
 - **Ben Smith's projects in South Australia**
 - **CRC Uptake project in Lachlan catchment**
 - **IFS project in lakes Sorell and Crescent in Tasmania**
 - **F.Vic trial in Rocklands Reservoir in Victoria**
 - **Any other suggestions?**

and subsequently into Pest Fish Management Plans

