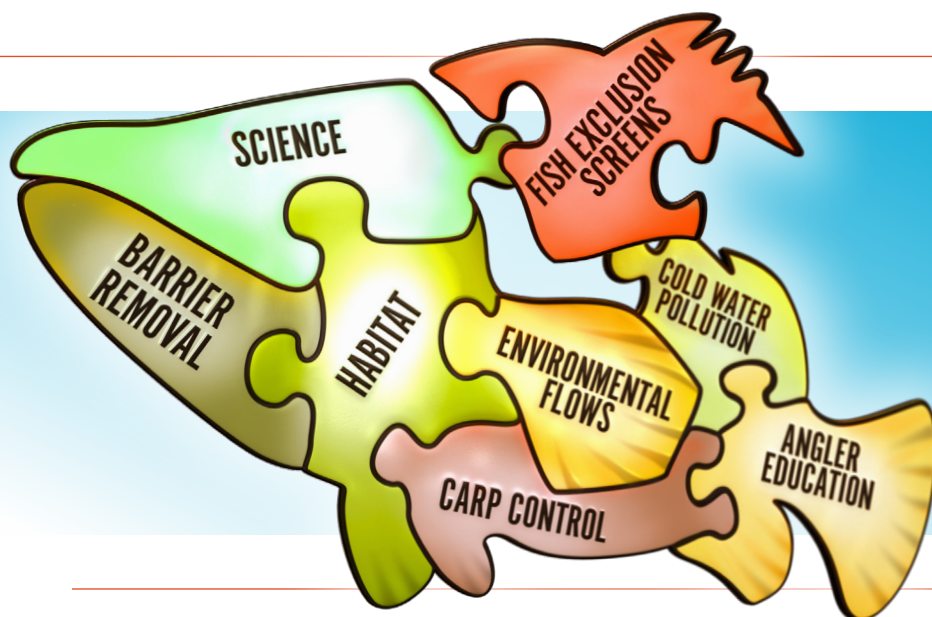


# Fish Exclusion Screens

## ANOTHER PIECE IN THE PUZZLE FOR NATIVE FISH RECOVERY

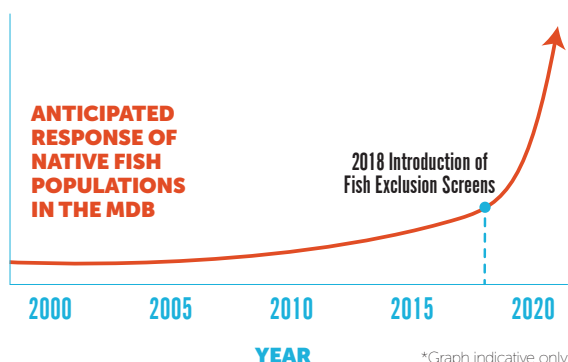


Fish Exclusions Screens are another piece in the puzzle that will leverage the initiatives undertaken in the last 20+ years to ensure the recovery of native fish populations.

### Murray-Darling Basin Native Fish Recovery Plan

Fish Exclusion Screens will lock in sustainable results for the native fish strategy, across the Murray-Darling Basin (MDB).

Fish Screens will significantly leverage and magnify the improvements to native fish populations that proactive initiatives and science have delivered over the last 20+ years. This accelerated growth will ensure sustainable native fish populations within the Murray-Darling Basin for the foreseeable future.



Progressive interventions have been improving native fish populations across the MDB. The introduction of Fish Exclusion Screens on gravity and pumped offtakes will retain fish in natural water ways and accelerate the recovery of native fish populations.

### The initiatives delivered over the past two decades have involved:

#### 1. REMOVAL OF BARRIERS

Thousands of kilometres, of waterways have been opened up with hundreds of fish passage structures built. This allows fish to freely travel to and from breeding locations.

#### 2. RESTOCKING

Comprehensive restocking programs have ensured the constant growth of native fish populations.

#### 3. HABITAT

Recreating natural habitats through re-snagging has created safe breeding grounds and protection for native fish.

#### 4. CARP CONTROL

The National Carp Control Plan is working towards the reduction and hopefully elimination of carp and other invasive species, to allow native fish populations to flourish.

#### 5. RECREATIONAL ANGLER EDUCATION

Promoting 'catch and release' and 'no re-entry' of invasive fish has significantly benefited native fish populations.

#### 6. SCIENCE

The study of native fish ear bones has delivered valuable information detailing the history of a fish's life and travels. This data allows educated decisions to be made about native fish management and investment focus.

#### 7. ENVIRONMENTAL FLOWS

Facilitating 'environmental flows' has allowed natural waterways that are primarily used to deliver irrigation water and subsequently fluctuate with irrigation demands, to be actively managed to replicate natural flow events. This has promoted breeding events that have proven beneficial to native fish populations.

#### 8. COLD WATER POLLUTION

Technology being explored on Intake Structures from dams is reducing cold water pollution in natural waterways.

The initiatives facilitated to date are the result of significant findings and important influences from passionate and dedicated contributors. These include fisheries personnel, scientists, environmentalists, fishermen (recreational and professional) and all levels of government. Such programs have reversed the decline of native fish populations and have seen the number of small and large bodied fish increase.

Unfortunately the success of these programs is compromised by the significant loss of native fish to irrigation diversion systems. The majority of water flowing through our natural water ways is diverted through gravity or pumped offtakes dragging millions of fish, larvae and eggs from the creeks and rivers, depleting the natural fish stocks that we have all worked so hard to improve.

Fish Exclusion Screens can prevent this loss.

Fish Exclusion Screens will leverage all other initiatives, to accelerate fish recovery outcomes across the Murray Darling Basin.

## THE 3 TYPES OF

# Fish Exclusion Screens



Cylinder Screens



Cone Screens



Travelling Screens



## What are Fish Exclusion Screens?

A Fish Exclusion Screen is basically a large filter (like a sieve). The filter has slot sizes from 1mm to 3mm that prevents all stages of fish life from entering through the screen. Further to this a Fish Exclusion Screen distributes and reduces the velocity of water flow as it is delivered through gravity diversions (channels) or pumped diversions. This often reduces flows from a few metres per second down to 0.1m per second. Subsequently, the diverted flow has a significantly reduced impact on the natural waterway. This is important when protecting floating eggs, juveniles and small bodied fish that can not swim away from high velocities, often becoming entrained in a diversion flow or impinged on a screen.

As expected, if the screens exclude fish and fish eggs they will also exclude other objects in the waterway from entering the diverted flow, subsequently protecting turtles, platypus and other animals as well as isolating weed and debris. This level of debris exclusion reduces system downtime, increasing energy efficiencies and improving water quality.



## How do Fish Screens work?

Fish Exclusion Screens are manufactured from wedge wire made from grade 304 stainless steel or specialised polymer profile mesh. These profiles are considered the best screening to promote self-cleaning of particles that enter the slots.

Any debris that is impinged (stuck) on the outside of the screen is dislodged by either, internal brushes that 'push' particles back out through the slot, as well as external brushes that remove debris to sweeping velocities or break up the particles so they can safely pass through the screen.

There are three options to power the self-cleaning brush system. Electrically, hydraulically or self-powered by the internal velocity through a prop system. The brushes operate automatically, as programmed or when there is flow for self-powered systems. Electric and hydraulic models operate on a timer which can be programmed to operate in accordance with debris loads. Usually they need only operate once or twice a day, for a minute or two.

Fish Exclusion Screens always operate submerged below water level and are designed to remain permanently submerged without the requirement for regular maintenance. Some screens can be designed with retrieval systems allowing the screens to be raised above the water level to facilitate inspection and maintenance if required.

## Will a standard Trash Screen work?

Screens that have been designed for trash exclusion are not suitable for fish protection. Fish Exclusion Screens, have been developed to ensure native fish species are protected throughout all life stages, with benefits to the irrigator incorporated.

Fish Exclusion Screens protect pumped and gravity diversions, ensuring fish of all life cycle stages are not removed from the natural water way, into a one-way trip down an irrigation channel or pump.

## Why do we need Fish Exclusion Screens?

Proven technology now exists to sustainability filter water entering irrigation systems. It prevents the entrainment of fish, larvae and eggs with the added benefit of protecting pumps from damage, clogging and debris.

Fish Exclusion Screens can filter down to 1mm orifices and self-clean to maintain 100% flow with low head loss from the screen.

## Screen Designs

There are proven designs of Fish Exclusion Screens that have operated in very harsh conditions for up to 20 years with minimal maintenance.

Fish Screens are new to Australia but have been used and proven in other countries. International screen designs have been adapted to meet Australian conditions and performance criteria to protect the interests of both, native fish and irrigator.

Solutions are designed for each application to ensure the product meets site specific performance requirements, accommodates local conditions and considers installation criteria to ensure the most effective and economical solution is provided.

Surprisingly, the Fish Screens are basically maintenance free. This is due to the unique self-cleaning features and the distributed screen area ensuring very low approach and through slot velocities.

## Aussie features for Aussie fish

Fish Exclusion Screens reduce the velocity levels at irrigation diversion points, to ensure native fish, embryo's, larvae and eggs are not lost or impinged as a result of coming into contact with an irrigation offtake, screen or screening structure.

There are a number of fish screen designs that can be customised for any type of gravity or pumped irrigation diversions from 1 ML/d to 20,000 ML/d.

Australian made Fish Exclusion Screens have been specifically developed to protect Australian native fish, within Australian conditions.

