more

fish

with more

habitat

The 'what' and 'why' of fish habitat

Coastal systems

aquatic habitat
rehabilitation

making more fish ...naturally
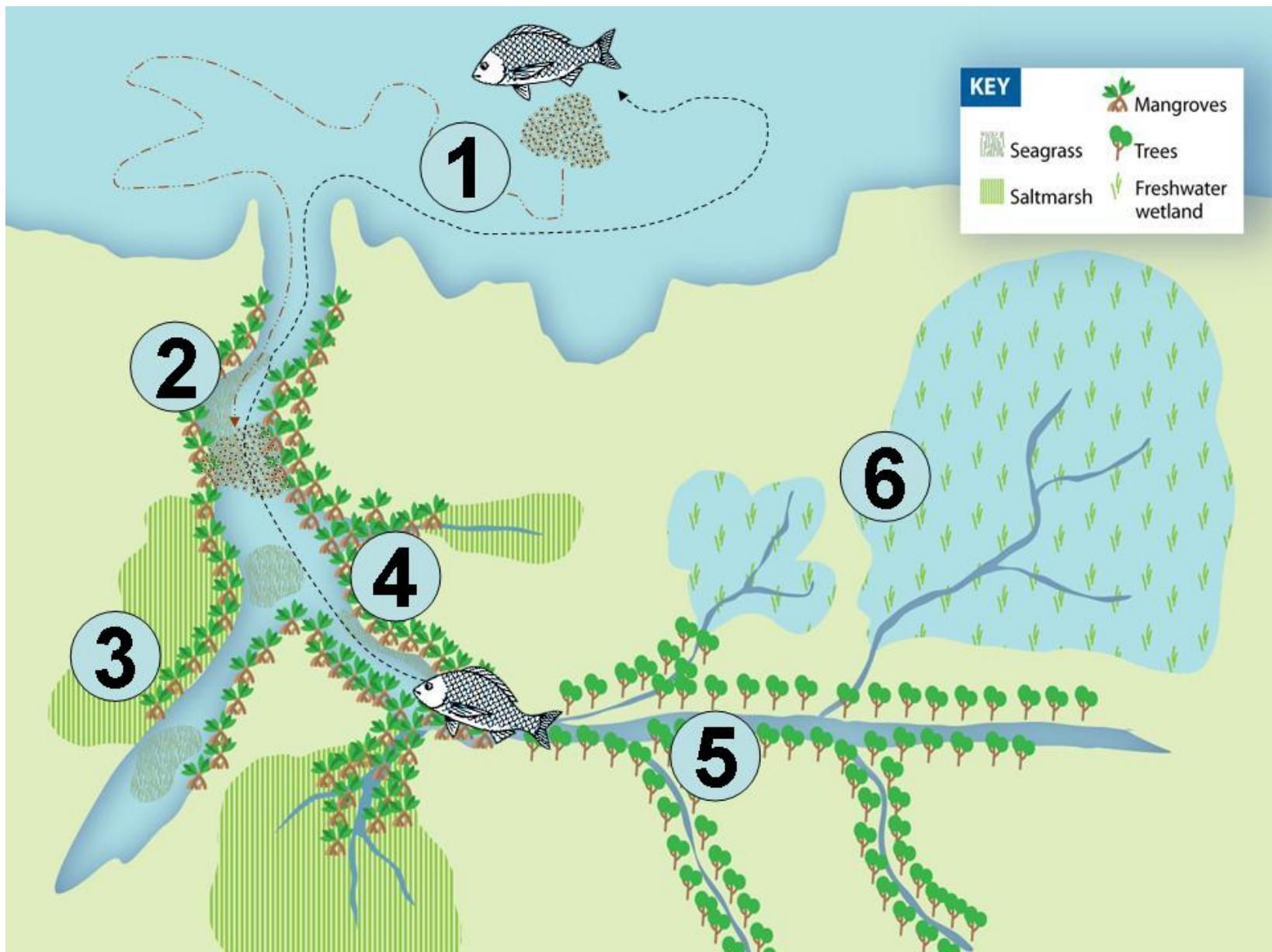
What fish need…

1 **CONNECTIONS** - Many estuarine fish including mulloway, whiting, luderick, flathead and bream spawn inshore. Australian Bass spawn in the upper estuary. Many of these fish can produce lots of eggs – eg flathead can produce from 300,000 to 4 million eggs.

2 **THE RIGHT CONDITIONS** - Larvae are only ~ 5mm (1/5 inch) when they must deal with wave action, tides and high river flows to reach the protection of the estuary. Their survival naturally varies between years.

3 **DIFFERENT HABITATS** - Fish larvae and juveniles will use different habitats at different stages of maturity – seagrass, saltmarsh and mangroves. Snapper larvae find seagrass by smell!

4 Juvenile fish prefer **MANGROVE** habitat as it provides both food and protection. Larger fish prefer feeding in adjacent **MUDFLATS** as they are not as prone to predation. Crab larvae from **SALTMARSH** provide an important food source for many fish. Fish can access saltmarsh on very high tides.

5 **AQUATIC and BANKSIDE VEGETATION** - Fish move between different habitats and different parts of the river and estuary. Juvenile bass will use reeds and ribbon weed for shelter in freshwater areas.

6 **WETLANDS** - filter water and improve water quality. They also support many smaller crustaceans and fish that become food for larger fish species.

This is what good fish habitat looks like

1 Healthy seagrass beds provide shelter and food.

2 Saltmarsh is an important source of food such as crab larvae for juvenile fish. Mangroves provide food and shelter.

3 Snags provide shelter and protection from predators for larger fish. Ribbon weed acts like seagrass in the freshwater zone.

4 Overhanging riparian (bank) vegetation provides shade, a source of food and acts to absorb nutrients and contain sediment before they reach the waterway.

5 Wetlands help manage water movement in the catchment and act as a filter. They provide habitat for smaller fish and crustacean species, which become food for larger fish.

6 Places like riffles help aerate the water and provide sites for some species to lay their eggs.
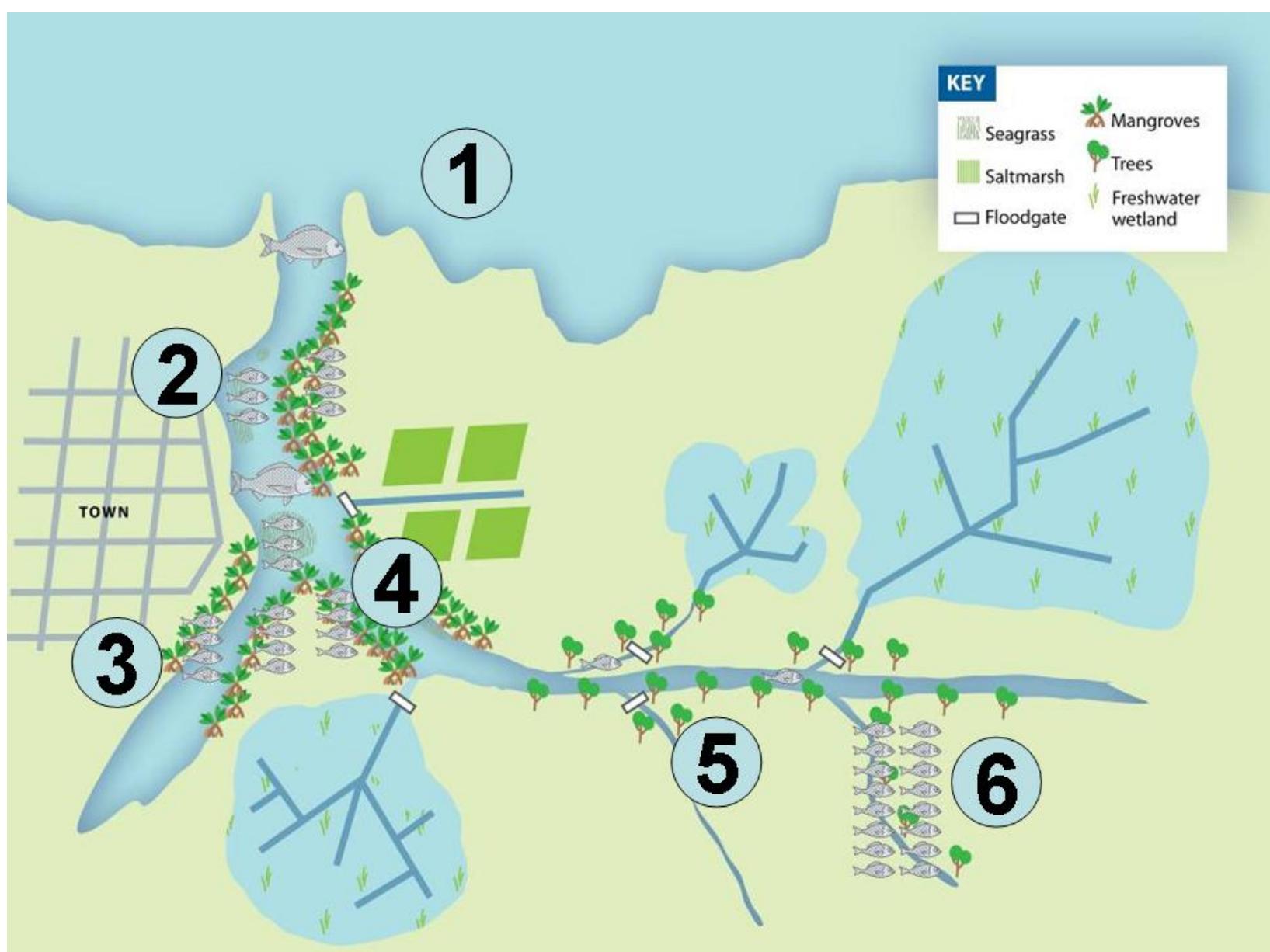
What has happened…

1 Seagrasses can be lost when **BOAT MOORINGS** create scour 'halos'. As the boat moves with the wind and tide, it drags the chain across the seafloor and wears the seagrass away. Seagrass and other aquatic vegetation is also lost from **DREDGING** or when smothered by silt.

2 **POOR WORK SITES** - Work sites that are not set up correctly can lead to soil washing into waterways and smothering the aquatic plants that protect juvenile fish and larvae. Fish gills can become clogged by fine **SEDIMENT**.

3 **VEGETATION REMOVAL and WETLAND RECLAIMATION** - Mangroves and saltmarsh are reclaimed for development. Riparian areas have been extensively cleared. In addition, introduced plants and animals interfere with the natural processes that native species have adapted to.

4 **DRAINS AND FLOODGATES** - Wetlands are drained and floodgated for agriculture and flood mitigation. This can prevent fish from accessing wetlands and waterways.

5 **ROADS AND WEIRS** - Weirs and poorly designed road crossings can block fish from moving where they need to go to access food and shelter. A barrier of >10cm or high water velocity can prevent fish passage.

6 Some areas are less degraded – these are the only places where fish larvae and juveniles can survive and grow.

This is what impacts on fish and their habitat look like

1 Boat moorings scour 'halos' when chains drag along seabed, removing seagrass.

2 Poor sediment controls at work site allowing soil to wash into waterways.

3 Clearing mangroves and saltmarsh and dredging seagrass means losing shelter and food sources for fish.
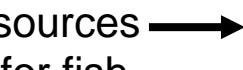
4 Floodgate draining wetlands for agriculture and flood mitigation.

5 Weirs and poorly designed road crossings block fish from moving where they want to go.

6 Good areas are the only places where fish larvae and juveniles can survive and grow.

So what?

When there are a lot of different types of habitat available to fish, they can pretty well all breed and grow – most of the larvae and juveniles will survive and make it become adults and then breed themselves.

Good condition

When an estuary is in **good condition** nearly all fish produced can survive to maturity.

This means the carrying **capacity is high**.

This means there are **MANY MORE FISH.**

In this really good year, some fish are still lost.

There is enough habitat to support the number of fish below the green line.
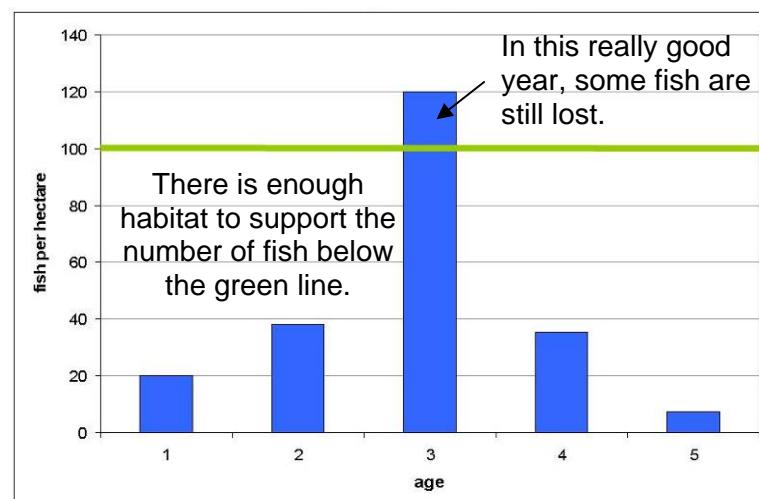

Right now over 97% of waterways in NSW are degraded in some way. Changes to the availability of fish habitat – the loss of seagrass, saltmarsh, mangroves, wetlands and riparian vegetation means that the opportunities for fish to grow and survive are drastically reduced.

Poor condition

When an estuary is in **poor condition** there is not the habitat available to support the spawned larvae and juveniles.

This means the carrying **capacity is low**.

This means there can be **MUCH LESS FISH.**

There is only enough habitat to support the number of fish below the red line.
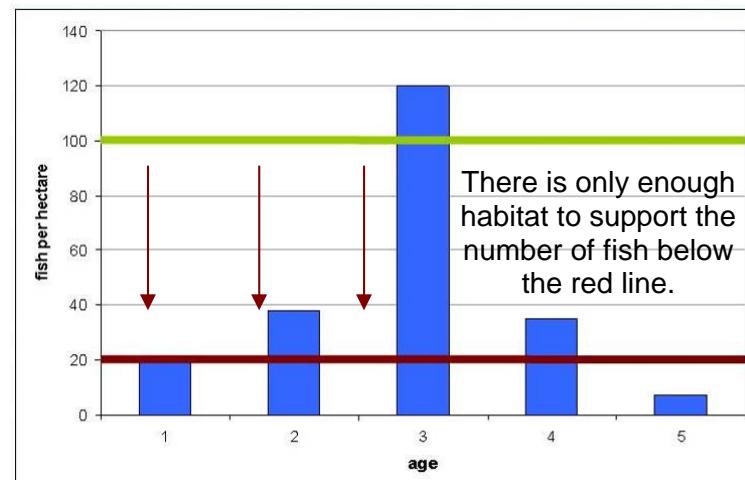

What this means is **there are a lot less fish around to catch**. However, if we can work to restore their habitat, the opportunities for fish to breed and survive increase meaning you effectively **improve your chances at catching a fish**.

More habitat means more fish

Take this example (see more, opposite):

Within one year of improving floodgate management, nearly 100 times the number of juvenile yellow-fin bream were able to access additional habitat and improve their chances of survival.

Meaning…. **MANY MORE FISH.**

Yellow-fin bream

Creek without floodgate
Drainage system with unmanaged floodgate
Drainage system with managed floodgate
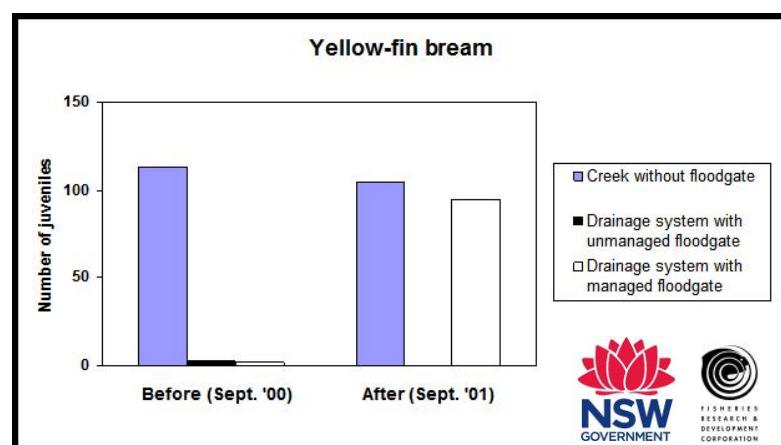
It's easy to improve fish habitat!

Install **ENVIRONMENTALLY FRIENDLY MOORINGS** to protect seagrass - two years after installation at Shoal Bay, former block and chain mooring sites had recovered to the same extent as those without moorings.

Encourage your council to be a **FISH FRIENDLY COUNCIL** - control erosion and siltation at work sites like this silt curtain being used at Banora Point (Tweed Heads).

Help install **ROCK FILLETS*** like these protecting the Wallamba River bank from wave induced erosion on the.

PROTECT and REPLANT MANGROVES and SALTMARSH to increase productivity. A hectare of mangroves supports fish worth a commercial value of ~$18,170 (2015 $$ value).

IMPROVE FLOODGATE MANAGEMENT – install an auto-tidal gate like this. Abundance of estuarine fish and crustacean species increased by up to 65% upstream of managed floodgates on Macleay and Clarence Rivers.

IMPROVE ROAD CROSSINGS* - Where box culverts replaced three pipe culverts, monitoring showed reduced water velocities and improved fish passage by 14 - 44%.

Be a **FISH FRIENDLY FARMER** - control stock accessing waterways by fencing and providing off-stream watering points like this one.

RETAIN and REPLACE NATIVE PLANTS along riverbanks to protect them from erosion and reduce sediment and nutrients from entering waterways. Conditions for stock will be improved by creating windbreaks.

* these works need a permit from NSW Department of Primary Industries

Where would you rather fish?

more
habitat more
fish

Who can help you?

Staff from Fisheries NSW are available to help identify local opportunities and provide advice on practical matters like filling in funding applications and obtaining permits.

The Fish Habitat Network are people from around Australia who help make fish happen by protecting and improving habitat that fish need to survive and thrive.

Contact

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For more information

Fisheries NSW

www.dpi.nsw.gov.au/fisheries/habitat

Fish Habitat Network

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