



# Restoring native fish populations

## Flows for fish in the Murray–Darling Basin



Freshwater Catfish, photo: Gunther Schmida

### Environmental water helps to provide a more natural flow regime for native fish and to restore their populations in the Murray–Darling Basin.

Fish are critical to the Murray–Darling Basin — they cycle nutrients, are food for other parts of the food web and sustain a billion dollar recreational fishing industry. Looking after fish also has environmental, economic and social benefits.

Fish need water to survive and while native fish have evolved within the ‘boom-bust’ nature of Australian rivers, they have not adapted to changes in river regulation and the associated changed flow regimes. Different fish prefer different timing, speed, size and temperature of water flows. While some fish prefer faster flowing river channels and anabranches, others live mostly in still wetlands or slow flowing habitats.

Some fish wait for higher flows to trigger spawning and carry their young downstream. Floods may even be necessary to help young fish find productive wetland areas where they can live and grow with lots of cover. Other fish make do with the range of conditions that come their way.

Environmental watering is an opportunity to target the flow or habitat needs of certain fish and to connect rivers with their wetland areas. This lets fish move along, into or out of the river.

Environmental flows can stimulate native fish to spawn and develop. As these flows help generate preferred food, habitats and drought refuge, fish populations can be maintained over time. Important fish habitat includes aquatic plants, submerged logs and branches (snags) and faster flowing stretches of water.

The NSW Government developed a classification system that allows water managers to target groups of fish that share flow and habitat needs. These five ‘functional groups’ form a management framework built on an up-to-date understanding of flow-related responses and lifecycle requirements of fish. This ‘Fish and Flows’ framework is helping river and water managers to generate flow regimes that benefit native fish.

While water management is one approach needed to improve outcomes for native fish, other parallel measures are needed, including:

- re-snagging waterways
- restoration of river, creek and wetland habitat
- providing fish passage along, out of and into waterbodies
- pest and weed control
- mitigation of cold water pollution.

# Five functional fish groups and their requirements

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## Flow pulse specialist (Group 1)

- Flow pulses during warm temperatures for spawning
- Growth and recruitment potentially enhanced by flows
- Lots of eggs, broadcast spawning
- Eggs and larvae drift in flow
- Medium to large-bodied, long lived



## Floodplain specialist (Group 3)

- Slow flowing, well-vegetated streams and wetlands
- Overbank flows may inundate habitat, provide access and dispersal
- Spawn annually, may repeat spawn in response to temperature
- Low numbers of eggs
- Small-bodied, short-lived



## Riverine specialist (Group 2a)

- Prefer fast flowing riverine habitats
- Spawn annually in response to temperature, independent of flow
- Growth and recruitment success may be enhanced by flows
- Moderate number of eggs, nesting species
- Move moderate distances for spawning
- Large-bodied, long-lived



## Generalist (Group 4)

- Able to occupy a range of streams and waterbody types
- Flexible spawning and recruitment strategies
- Spawn annually, may repeat in response to temperature, independent of flow
- Low number of eggs
- Move short distances
- Small to medium-bodied, short to medium-lived



## Riverine specialist (Group 2b)

- Prefer slower flowing river habitats, anabranches and lakes
- Spawn annually in response to temperature independent of flow
- Growth and recruitment success potentially enhanced by flows
- Medium number of eggs, nesting species
- Move shorter distances for spawning

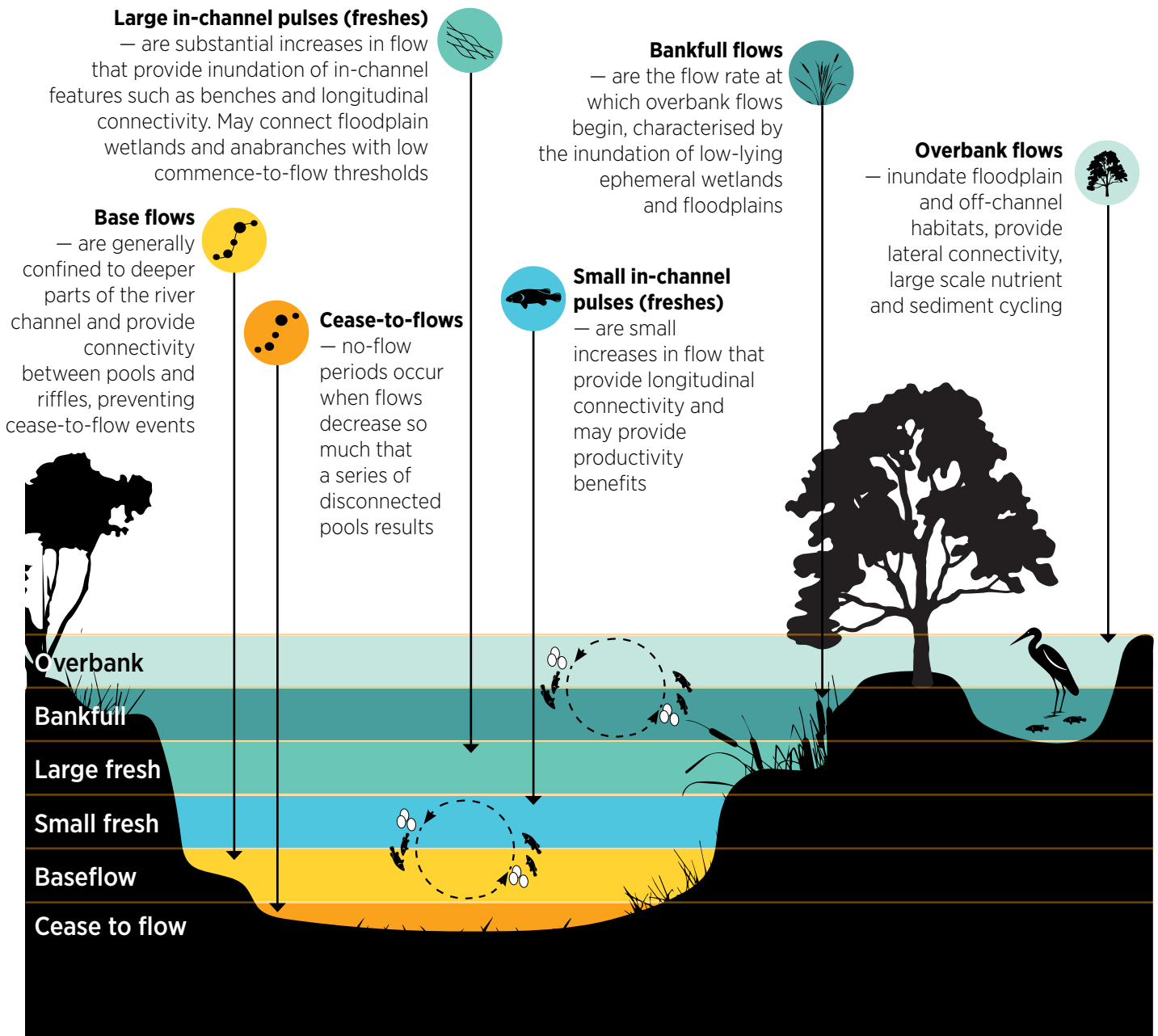


## Generalist non-native (Group 5)

- Able to occupy a range of streams and waterbody types
- Flexible spawning and recruitment strategies
- Spawn annually, may repeat in response to temperature
- Moderate to high egg numbers
- Move short distances
- Small to medium-bodied and medium-lived



# Components of the flow regime



Find out more at [www.environment.nsw.gov.au/environmentalwater](http://www.environment.nsw.gov.au/environmentalwater)

Photos, all by Gunther Schmida

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