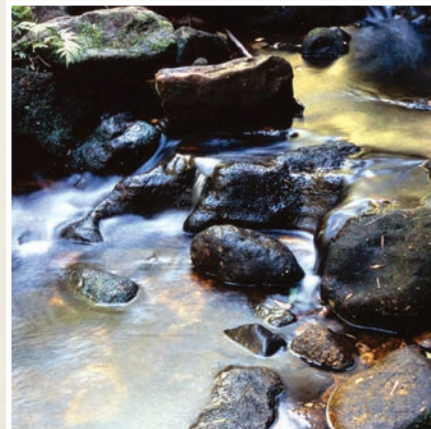




# ROCKY CREEK DAM CATCHMENT PROTECTING AQUATIC ECOSYSTEMS...



The sheer cliff walls, lush green gullies and spectacular waterfalls that characterise the catchment are relics of its volcanic past. The hard rocks have been carved over time by the power of water, creating deeper and deeper water courses, and the valley where Rocky Creek Dam lies today.

## In the Catchment

There are special creek ecosystems in the Rocky Creek Dam catchment. Rocky Creek and Gibbergunyah Creek are the main water courses in the catchment, tumbling over cascades and water falls and slowly flowing through pools. There are also many 'occasional' creeks in the lush green gullies that only flow when it's raining. They support many aquatic animals and plants.

The shy platypus (*Ornithorhynchus anatinus*) is a mammal that makes its burrow in the banks of the creeks, and swims with its webbed feet and paddle-shaped tail. It uses its duck-like bill to scoop up worms, small shellfish, and other animals from the creek bottom. The Water Rat (*Hydromys chrysogaster*) is another mammal that spends a lot of time in the creeks.

Reptiles in and around the creeks include the Saw-shelled Turtle (*Elseya latisternum*) and the Eastern Water Dragon (*Physignathus lesuerii*). You can often hear them splashing into the water, even if you don't see them.

Several species of kingfisher dive swiftly into the waters of the catchment to catch their food, including the Azure Kingfisher (*Alcedo azurea*), Forest Kingfisher (*Todirhampus macleayi*) and Sacred Kingfisher (*Todirhampus sanctus*).

Many species of frogs inhabit the creeks and wet gullies. Four of these frogs are listed as threatened species: Fleays' barred Frog (*Mixophyes fleayi*); Pouched Frog (*Assa darlingtoni*); Giant Barred Frog (*Mixophyes iterates*), and Loveridges' Frog (*Philoria loveridgei*).

Small fish and crustaceans also live in the fastrunning creeks, such as the Firetail Gudgeon (*Hypseleotris galii*), Cox's Gudgeon (*Gobiomorphus coxii*) and freshwater shrimp. (See *Info Sheet 7: Protecting the Rainforest* to learn about the other animals and plants that inhabit the catchment.)

These creek systems  
support many native  
animals and plants.

**Forest Kingfisher** *Todirhampus macleayi*  
© Kathie Atkinson/AUSCAPE



**King Fern** *Todea barbara*  
© Roger Brown/AUSCAPE



**Platypus** *Ornithorhynchus anatinus*  
© D. Parer & E. Parer-Cook/AUSCAPE





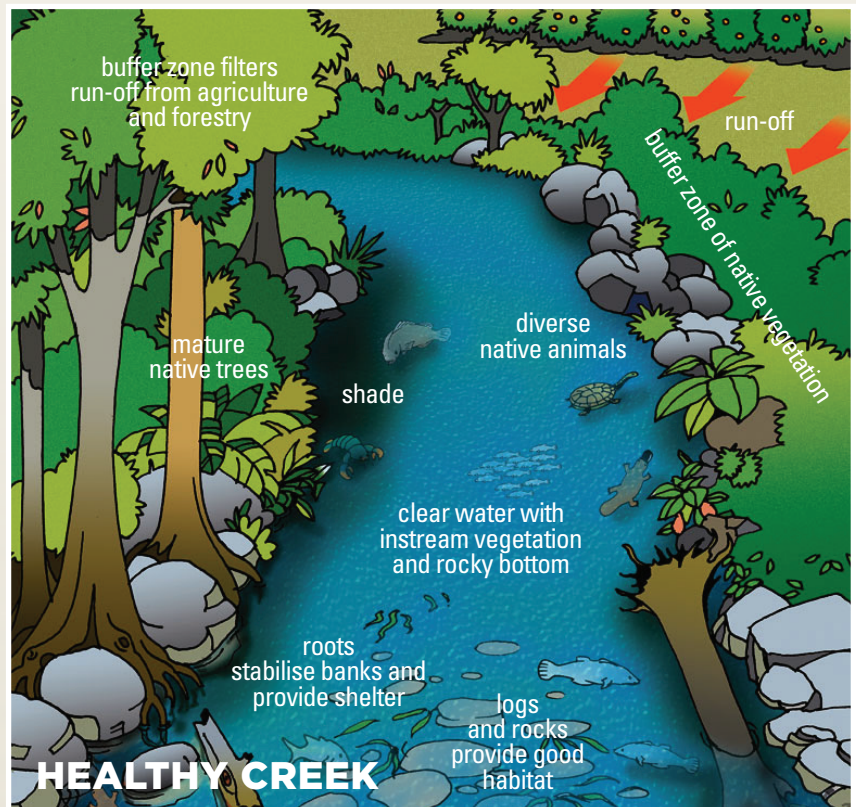
**All these animals depend on healthy creek systems, which work like this:**

## Protecting the Creeks

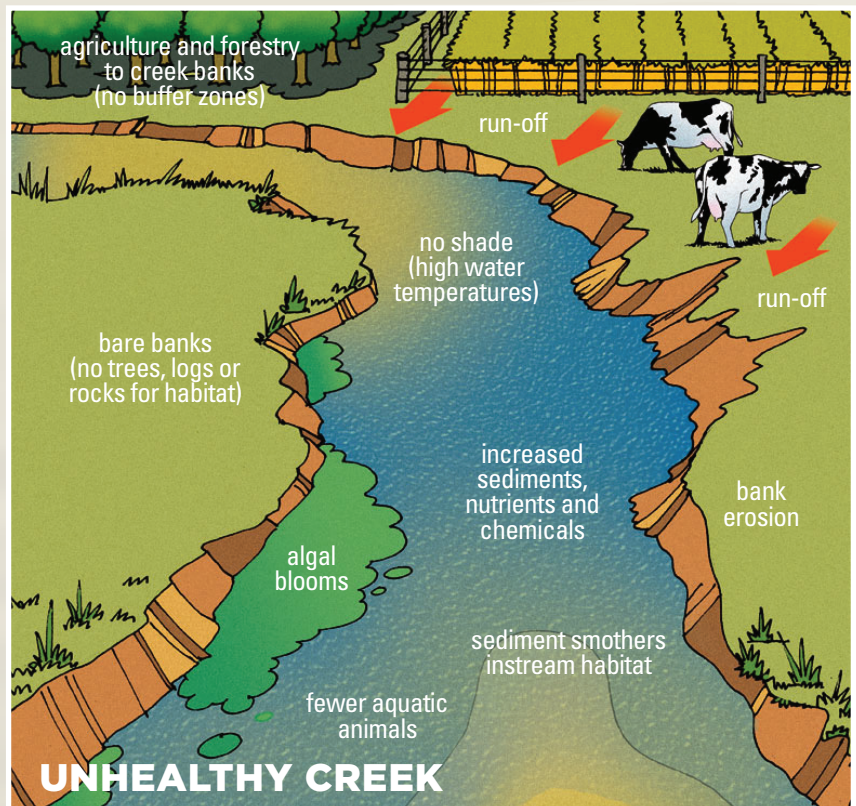
Rous County Council work together with National Parks & Wildlife Service to identify and manage the risks to these sensitive riparian areas and to water quality.

Rules that are enforced by Rous County Council to protect the creeks and the water quality in them are:

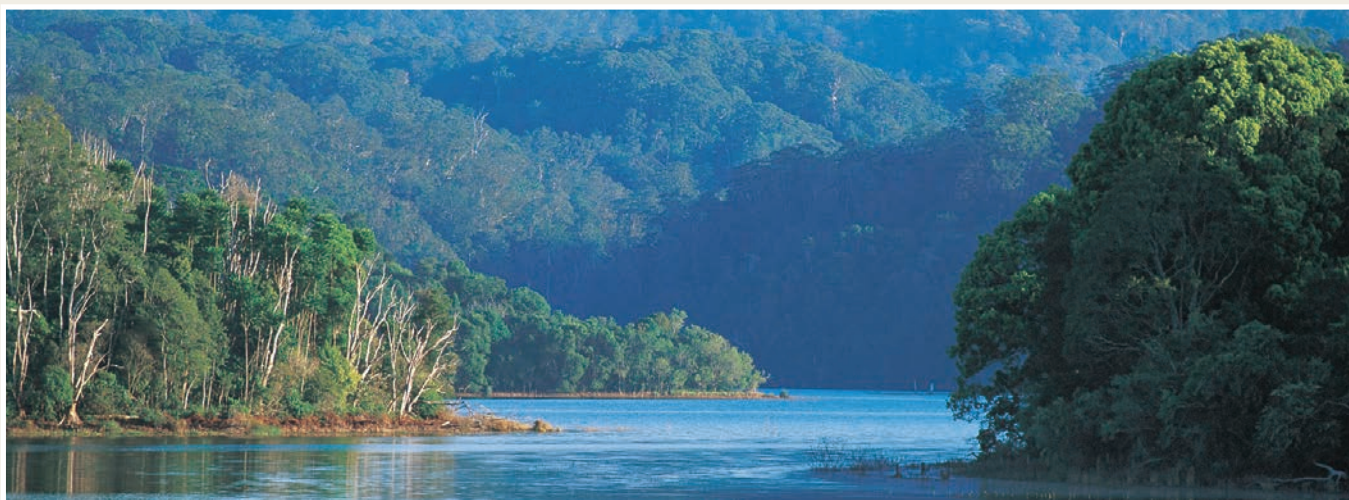
- no swimming, fishing, boating or camping in the catchment area.
- no motor vehicles (including motorbikes) in sensitive parts of the catchment (including major creek crossings of Rocky Creek Dam).



**Risks to water quality and the health of creek ecosystems include:**





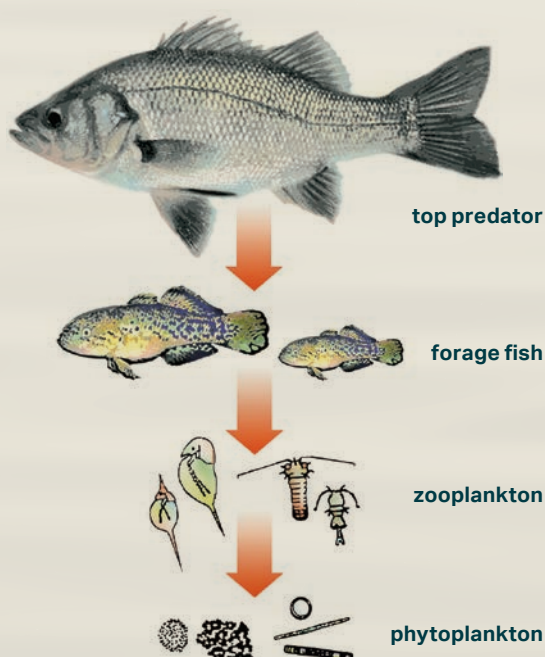


## In the Dam

The dam itself is also an aquatic ecosystem, where living organisms and their nonliving environment (such as rocks and soil chemistry) are inseparably interrelated and interact upon each other.

When this ecosystem is studied in detail, it is possible to observe the transfer of energy from the source in plants through a series of organisms with repeated occurrences of eating and being eaten. This is known as the food chain.

This diagram illustrates the food chain of Rocky Creek Dam. The top predators in the dam are the Australian Bass (*Macquaria novemaculeata*) and the Eastern Freshwater Cod (*Maccullochella ikei*). These fish feed mainly on small fish and crustaceans such as the Firetail Gudgeon (*Hypseleotris galii*), Cox's Gudgeon (*Gobiomorphus coxii*) and freshwater shrimp. These species, in turn, forage on the zooplankton (microscopic animals). The amount of phytoplankton (microscopic plants including algae) in the dam is controlled by the amount of grazing by Zooplankton.



Maintenance of the aquatic habitat relies on not taking out too much water so the water level doesn't drop too much. The protection of water quality through catchment management is important for the health of this ecosystem, and for keeping the ecosystem in balance.

## Downstream from the Dam

Healthy creek ecosystems downstream from the dam depend on all the same things described in the diagram of creek systems inside the catchment area. The land uses below the dam wall, however, are quite different from Rocky Creek Catchment which is primarily reserved for conservation and catching water. It is, therefore, more of a challenge to keep creek systems healthy downstream from the dam. A healthy water catchment and good water quality in the dam, however, significantly protects the health of the aquatic ecosystems downstream from the dam.

Healthy catchments have  
flow-on effects!

Like us, ecosystems downstream from the dam also need appropriate amounts of water to survive and be healthy. It is important to develop ways of sharing water with them. At this point in time, no water is released through the dam wall unless the dam is full and water is flowing over the spillway. This is another good reason to ensure that we use less water so that the creeks downstream can be healthy. In the future, the structure of the dam might be changed to allow appropriate 'environmental flows' to be ensured even when the dam is not full.

A healthy water catchment and  
good water quality in the dam...  
significantly protects the health of  
the aquatic ecosystems  
downstream from the dam.

This will help protect endangered species like the **Eastern Freshwater Cod** (*Maccullochella ikei*) which needs enough water flowing in creeks in order to complete its breeding cycle.



**Eastern Freshwater Cod**

*Maccullochella ikei*

© Jack Hannan, NSW Fisheries.

These large fish (up to 41kg) used to be common in the Richmond and Clarence Rivers, but over the last 30 years have become rare. It is thought that their decline has been caused by a combination of too much water being taken out of river systems (eg, for town water supply and agriculture); pollution (such as toxins, heavy metals, fertilizers, animal wastes, acid run-offs); habitat degradation (including reduction in rocks and snags, undercut banks and aquatic vegetation); barriers to waterways such as dams and weirs; competition with introduced species and illegal fishing. An artificial breeding and stocking program began in 1989 in Rocky Creek Dam and research programs have now found eastern cod up to 60cm there. A wider recovery plan has been developed for the eastern cod under the Fisheries Management Act (1994). It is not yet clear whether self-sustaining populations of the fish have been established.



(Sources: Fishfacts newsletter about eastern cod produced by NSW Fisheries; Nightcap National Park brochure produced by NSW National Parks & Wildlife Service)

Healthy catchments have  
positive flow-on effects.

## TRY THIS!



### Learn with your...



"Think about how some of the things you do every day, if you did them here in the Rocky Creek Dam catchment, would affect the health of the creek ecosystems. What activities would be the worst? What types of animals and plants could you affect?"



"What are your favourite animals that live in the creeks around here? How would you feel if they became rare, endangered, or even extinct? What do you need to do to make sure that doesn't happen?"



"Look at the dam, and see if you can imagine what the ecosystem is like under the surface of the water? What plants and animals would you find there? Now, see if you can see any rainforested gullies from where you stand. When they are really wet, try and imagine what those ecosystems would look like. What sorts of animals and plants would you find there?"

**Learning objective:** To understand the aquatic ecosystems of Rocky Creek Dam catchment and downstream from the dam; some of the catchment management activities which protect these terrestrial ecosystems; and the importance of maintaining environmental flows.



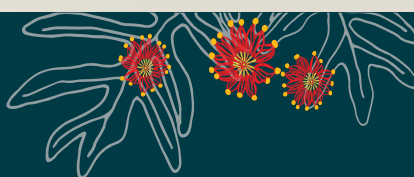
**Saw-shelled Turtle** *Elseya latisternum*

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For further information contact:

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These information sheets were originally prepared for Rous County Council by Sustainable Futures Australia in liaison with Widdjabul elders. © Rous County Council and Sustainable Futures Australia 2004. This is an educational project for the protection of water land, and for reconciliation.

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