

Food Web in Orphan School Creek



Tree Frog in web.

by Daniel Smart

ENVIRONMENT

AQUATIC

POLLUTION

5 Creeks



Fairfield
City
Celebrating diversity

Fairfield
City
Celebrating diversity

DISEASE

Where is Orphan School Creek?

The Orphan School Creek, together with its St Elmos Creek, Green Valley Creek and Clear Paddock Creek tributaries, flows for approximately 24.8 kilometres from Abbotsbury in the western suburbs of Fairfield City to Carramar in the east. Orphan School Creek is a tidal creek in nature, flowing into Prospect Creek, it rises and falls with the tide from the Georges River. Orphan School Creek is part of the Georges River and Botany Bay Catchment.

Orphan School Creek is home to a variety of fish, native animals and birds (known as fauna) as well as native trees and bush (known as flora).

Orphan School Creek is known as an “endangered ecological community”: it is under threat from surrounding urban development and activity



Prospect Creek at Carrawood Park.



Entrance to St Elmos Creek, small tributary of Orphan School Creek at low tide.



A changing creek environment

In recent years, the Orphan School Creek has changed dramatically. Since the development of areas close by, land clearing for urban development, and increased surface run-off often containing litter and toxins. Much of the wildlife once found in and around the creek has been wiped out. Weirs and concrete channels have reduced native fish habitats, with species like the Australian Bass and Jollytail Galaxias living in greatly reduced habitats from 24.8 kilometres of natural creek line to approximately 1.5 kilometres of natural creek line today.

Land clearing for urban development has also changed the structure of the creek beds. Water now flows faster because trees that once slowed the water have been cleared. In periods of heavy rain, fish are now carried further down stream in rapid waters filled with debris that can cause injury or stress to the fish.

The natural habitat for aquatic creatures, like fish, has been greatly reduced because land clearing means that the branches and leaves that were once in the water providing essential food sources and nutrients, are no longer present and able to perform this vital function. Logs also shelter fish from fast flowing waters and predators, and are very important for their survival.



Green Valley, Orphan School Creeks.



Where concrete meets the creek, with Orphan School Creek on the left and Clear Paddock Creek on the right.



Weir at Canley Vale.

The perfect environment for sustaining aquatic life and the food web

The four basic needs of fish – water for survival, shelter, food resources and breeding areas – are all found in unaltered streams. Quiet backwaters, slow deep pools, undercut banks, weed beds, boulders, shaded areas, gravel beds and large submerged logs provide a rich and diverse environment that is fully utilised by many species of native freshwater fish.

Orphan School Creek once had a very high, biodiverse environment. Because its creek bed was made up primarily of gravel, 2 to 3 centimetre particles, it provided the perfect environment for a wide range of small creatures to live.

Studies have shown that in gravel-bed streams, up to 500% more aquatic invertebrates, or 'food for fish', can be found. Unfortunately, this is not the case for Orphan School Creek, where naturally formed gravel beds have been silted and contaminated by heavy metals and batteries, resulting in the destruction of huge quantities of aquatic life.



Clam found in Inter-tidal and Riffle zones.



Aquatic Invertebrates.

The many forms of life in and around Orphan School Creek

There are many good reasons for restoring Orphan School Creek to its former condition. An improved creek environment will mean more fish, which will result in more birds adopting the creek as a viable feeding ground.

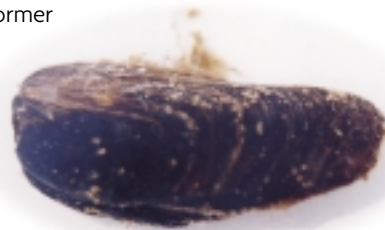
Native fish found in Orphan School Creek include the Australian Bass, Australian Smelt, Silver Biddy, Southern Blue Eye, Yellowfin Bream, Bullrout, Jollytail Galaxias, Dwarf Flat Head Gudgeon, Flat Head Gudgeon, Striped Gudgeon, Cox's Gudgeon, Sea Mullet, Freshwater Mullet, Empire Fish, Estuary Perchlet, Long-finned Eel, and the Short-finned Eel.

A survey of a 50 metre section of Orphan School Creek, between the suburbs boundary of Fairfield and Canley Vale, revealed a diversity of habitat for various species of fish. Eight different types of habitat were observed:



Fish survey site:

This area is a fish nursery where Empire Fish, Dwarf Flathead Gudgeon, Flathead Gudgeon, Striped Gudgeon and Australian Smelt breeds are found.



Black Mussel (*Mytilus edulis*).

- **Deep pool** with rocks, logs, weeds and gravel bed
- **Small pool** with logs and a mud bottom
- **Raised weed bed** with littered logs and rocks, gravel and a cut channel
- **Riffle zone** with rocks, a few logs and gravel underneath
- **Rock shelves** with shallow, flat areas and drop off points
- **Small pool** with undercut banks, rocks, logs, with a rock shelf and gravel bottom.
- **Open areas** with a gravel bed lined with logs, rocks and weeds
- **Inter-tidal zone** with rocks, swamp plants, and a sandy mud bottom – a very rare habitat still intact in Orphan School Creek, this site being an excellent model as a diverse habitat and for some creatures it is a vital area to for survival. This site is exposed to the air at low tide, and submerged at high tide, with an approximate drop of 1 metre between tides.



Inter-tidal zone.



Riffle zone and rock shelf



Open area

Plant life along the Creeks

Plant life along the banks of Orphan School Creek includes species from the Sydney Coastal River Flat Forest and the Cumberland Plain Woodland.

The Sydney Coastal River Flat Forest is listed as an endangered ecological community under the Threatened Species Conservation Act 1995. In the NSW National Parks and Wildlife Service (NPWS) vegetation mapping of the Cumberland Plain, two main forms have been identified along Orphan School Creek:

- **Sydney Coastal River Flat Forest** - Riparian Forest and the Alluvial Woodland. Only the Alluvial Woodland is found in Fairfield City
- **Cumberland Plain Woodland** – Shale hills woodland and shale plains woodland, both of which are found in Fairfield City.

The **Alluvial Woodland** occurs along minor watercourse and next to riparian forests. It commonly includes trees such as Cabbage Gum (*E. amplifolia*), Forest Red Gum (*E. tereticornis*) and dense stands of Swamp Oak (*Casurina glauca*). Good local examples of the Alluvial Woodland can be found at the Western Sydney Regional Park, Cowpasture Road, Horsley Park.

The **Shale Hills Woodland** occurs mainly on the elevated and sloping southern half of the Cumberland Plain. The dominant canopy trees include Grey Box (*Eucalyptus moluccana*), Forest Red Gum (*E. tereticornis*) and Narrow Leaved Ironbark (*E. crebra*). It has a shrub layer dominated by Blackhorn (*Bursaria spinosa*), with other shrubs, such as *Acacia implexa*, *Indigofera australis* and *Dodonaea viscosa* ssp *cuneata*.

Shale Plains Woodland is the most widely distributed form of Cumberland Plain Woodland. *Bursaria spinosa* is the dominant shrub species and there are canopy trees such as Grey Box (*Eucalyptus moluccana*), Forest Red Gum (*E. tereticornis*), Spotted Gum (*Corrymbia maculata*) and Thin Leaved Stringybark (*E. eugenioides*).

The diverse understorey layer is similar for both forms of Cumberland Plain Woodland. It is common to find grasses, such as Kangaroo Grass (*Themeda australis*), Weeping Meadow Grass (*Microlaena stipoides* var *stipoides*) and herbs, such as Kidney Weed (*Dichondra repens*), Blue Trumpet (*Brunoniella australis*) and *Desmodium varians*.



Weed invasion at St Elmos Creek, a small tributary of Orphan School Creek.



Tree - Johnston Park.

Weeds such as Morning Glory and Balloon Vine create disharmony by casting shade on large trees and blocking light from entering the understorey. These rampant weeds spread through the canopy causing further destruction. Weeping Willow also causes havoc with its fast growing and fast spreading root system that covers creek beds with a suffocating layer of matting that reduces the biodiversity in the creek. Alligator Weed, growing in the water along the banks, provides an excellent habitat for a pest fish called Gambusia. This fast-growing weed takes over native swamp plants and the environment needed to sustain native fish. Green Cestrum (a poisonous weed), Paddy Lucerne and Castor Oil plants are also destructive.

The NSW National Parks and Wildlife Service have more detailed information about the various types of species that can be found.

Native Birds in the Orphan School Creek environment

Native water birds found near Orphan School Creek include the Australian Bittern, Eurasian Coot, Great Black Cormorant, Little Pied Cormorant, Little Egret, Great Crested Grebe, Dusky Moorhen, Purple Swamp Hen, Great Herron, Pacific White Necked Herron, White Faced Herron, Australian White Ibis, Azure Kingfisher, Sacred Kingfisher, Kookaburra, Masked Lapwing (Plover), Yellow Billed Spoon Bill, Grey Teal (Duck), Chestnut Teal (Duck), Pacific Black Duck, Manned (Wood) Duck and many more. Without aquatic life in the creeks, many of these birds could not survive in Fairfield, as many of these birds eat lots of fish!

The Great Black Cormorant eats between 440 and 660 grams of fish or at least five average sized fish each day. The Little Pied Cormorant eats up from 150 to 225 grams of fish daily, or five smaller fish each day. Quite simply: more fish means more birds in and around our creeks.

Bird Species observed during 2001/2002, Orphan School Creek, East Parade, Fairfield

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|--|----------------------------------|---------------------------------|
| 1. Australian White Ibis (Sacred Ibis) | 27. Fairy Martin | 53. Red Rumped Parrot |
| 2. Australasian Bittern | 28. Galah | 54. Red-browed Firetail |
| 3. Australian Magpie | 29. Great Black Cormorant | 55. Restless Flycatcher |
| 4. Australian Magpie Lark | 30. Great Crested Grebe | 56. Richards Pipit |
| 5. Australian Raven | 31. Great Egret | 57. Rufous Fantail |
| 6. Azure Kingfisher | 32. Grey (White) Goshawk | 58. Sacred Kingfisher |
| 7. Bell Miner | 33. Grey Butcher Bird | 59. Silveryeye |
| 8. Black Falcon | 34. Grey Fantail | 60. Southern Boobook Owl |
| 9. Black Shouldered Kite | 35. Grey Teal (Duck) | 61. Spangled Drongo |
| 10. Black-eared Cuckoo | 36. Horsfield's Bronze Cuckoo | 62. Spotted Pardalote |
| 11. Black-faced Cuckoo Shrike | 37. Jacky Winter | 63. Sulphur Crested Cockatoo |
| 12. Brown Falcon | 38. Laughing Kookaburra | 64. Superb Fairy Wren |
| 13. Bush Cuckoo | 39. Little Eagle | 65. Swamp (Marsh) Harrier |
| 14. Brush Wattle Bird | 40. Little Egret | 66. Tawny Frogmouth |
| 15. Chestnut Teal (Duck) | 41. Little Pied Cormorant | 67. Weebill |
| 16. Common Koel | 42. Maned (Wood) Duck | 68. Welcome Swallow |
| 17. Crested Pigeon | 43. Masked Lapwing (Plover) | 69. Whistling Kite |
| 18. Crested Shrike Tit | 44. Masked Woodswallow | 70. White Faced Heron |
| 19. Crimson Rosella | 45. Mistletoe Bird | 71. White Plumed Honey-eater |
| 20. Dollar Bird | 46. Noisy Miner | 72. White-bellied Cuckoo Shrike |
| 21. Double-barred Finch | 47. Pacific (White Necked) Heron | 73. White-bellied Sea Eagle |
| 22. Duky Moorhen | 48. Pacific Black Duck | 74. Willie Wagtail |
| 23. Eastern Rosella | 49. Pallid Cuckoo | 75. Yellow Billed Spoonbill |
| 24. Eastern Spinebill | 50. Pied Currawong | 76. Yellow faced Honey-eater |
| 25. Eastern Whip Bird | 51. Purple Swampphen | 77. Zebra Finch |
| 26. Eurasian Coot | 52. Rainbow Lorikeet | |



**Sulphur Crested
Cockatoo's, Johnston
Park along Orphan
School Creek.**



**Water Birds,
Great Egret.**

Quick Quiz for Food Web in Orphan School Creek by Daniel Smart

1. What are the **four** things that fish need to **survive**?
2. What once **gave** Orphan School Creek its **high biodiverse** environment?
3. Name the **Forest** and the **Woodland** found along Orphan School Creek?
4. Which **weed** provides an excellent habitat for **Gambusia**, a non-native fish that lives in Orphan School Creek?
5. The Great Black **Cormorant** eats how much fish every day?
 - a. 40 to 60 grams
 - b. 150 to 225 grams
 - c. 440 to 660 grams
 - d. 800 grams to 1 kilogram.
6. Which creek does Orphan School Creek **flow** into?
7. If you were to **sail** down the Georges River, which historic **Bay** would you arrive in?