

# BERMUDA KILLIFISH

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## OVERALL TARGETS

Short term (5 years): To research the biology and ecology of Bermuda's killifish in order to promote effective management aimed at sustaining current population levels.

Long term (30 years): To increase the population and range of the killifish throughout Bermuda.

## SPECIES PROFILE

### **Scientific names:**

*Fundulus bermudae*  
*Fundulus relictus*

### **Other local names:**

Mangrove minnow  
Mangrove mullet

**Global status:** Endangered

**Global distribution:** Only found in Bermuda.

**Status in Bermuda:** Endemic and endangered.

**Distribution in Bermuda:** Limited to 9 ponds scattered across the Island.

**Conservation importance:** Endemic species that are disappearing in some of the ponds. Killifish help to keep mosquito numbers low by eating the larvae.

**Habitat:** Killifish live in fresh, brackish, and marine ponds.

**Threats:** Habit loss, pollution from land runoff, and predation.

## BACKGROUND INFORMATION ON SPECIES

Very little is known about the ecology of our killifish. They are a schooling fish which feed on detritus and small invertebrates, such as crustaceans and insect larvae. There are at least two distinct species of killifish present on Bermuda and it appears that no pond contains mixed populations of both species, therefore it is critical not to mix the different genetic stocks.

### *Life History*

Female killifish scatter their eggs among mangrove roots and aquatic vegetation during the spring and summer months. These small eggs are oily, have a slightly yellow hue, and are left to hatch on their own. While we do not know how long killifish live for in Bermuda, they can grow up to 13 cm in length. Males are smaller than the females, and often have a dark eyespot ringed in white on their dorsal fin during the breeding season. Terrapins, herons and other birds feed on killifish as do other fish species, including the introduced mosquitofish *Gambusia holbrooki*.

### *Existing Measures for Conservation*

Most of the killifish populations are in ponds located in nature reserves, which are protected areas under the Bermuda National Parks Act (1986). However, many of the killifish ponds are adjacent to either roads, agricultural land or golf courses, which makes them susceptible to chemical pollution from surface run off. Individuals from the Warwick Pond population are currently being bred in captivity for eventual release into recently restored fresh water ponds in the central parishes of Bermuda. Research has determined the population size and sex ratios in most of the killifish ponds, and the genetics of each population are being investigated.

## Recommended Actions

*Legislation and Policy:* List the killifish under the Protected Species Act (2003).

Activity	Priority	Action Taken
Implement a species recovery plan	A	✓

*Habitat Protection:* Promote the protection of key habitats.

Liaise with the Department of Forward Planning to ensure that the existing level of protection for the parks and nature reserve ponds is maintained.	A	
Identify, restore and/or rehabilitate other suitable wetland habitats to a state where killifish could be introduced.	A	✓
Identify and buy suitable wetland habitats that are not currently within existing parks and nature reserve protection.	B	

*Direct Species Intervention:* Implement plans to control the harmful effects of other species.

Implement a red-eared slider control programme.	A	✓
Initiate a captive breeding programme for those pond populations that are identified as critically low (for eventual translocation).	B	

*Research and Monitoring:* Promote ongoing research and monitoring programmes for killifish over the next 5 years.

Initiate a census study to assess the current distribution, total population, and structure of the killifish.	A	✓
Initiate studies examining the basic biology and ecology of killifish.	A	✓
Perform genetic analyses to establish the degree of speciation among the various pond populations of killifish found in Bermuda.	A	✓
Investigate the interactions between killifish and the introduced mosquitofish <i>Gambusia holbrooki</i> .	B	
Identify and analyze the diet of predator species, possibly through stomach content analysis, to determine whether killifish are being targeted as food items.	B	
Monitor water quality of all known killifish ponds.	B	
Perform a comprehensive biological and hydrological study of all known killifish ponds.	B	✓

*Communications and Publicity:* Promote ongoing public awareness of the threats to, and conservation of, Bermuda's killifish.

Develop a media campaign to explain threats to, and responsible public behaviour towards, killifish conservation.	A	
Continue to publish bi-annual killifish articles in local newspapers and magazines, as well as with presentations in schools, describing various aspects of killifish biology and ecology.	A	✓

*Plan Monitoring:* Develop and implement a monitoring plan to assess the success of the species action plan.

Provide an annual report to the Department of Conservation Services on the progress of the species action plan.	A	
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**Principle contact:** Bermuda Biodiversity Project Coordinator