



Freshwater fish of the Melanesian region

Story by David Boseto

FRESHWATER RESOURCES ARE UNDER serious threat on all corners of the globe from anthropogenic influences. The island nations of Melanesia are particularly vulnerable due to their limited freshwater resources, burgeoning populations and increasing extractive activities from mining and logging companies. Available data suggest that between 20-35% of freshwater fishes are vulnerable, endangered or extinct, mostly because of habitat alteration. This fauna is nutritionally and economically important. Fish are easily surveyed and certain species provide good indication of water quality and ecosystem well-being. However, there are serious gaps in knowledge on the biodiversity and taxonomy of freshwater fishes in the region with major on-the-ground implications in terms of freshwater and integrated multi-system management.

Throughout the tropical Pacific much conservation attention focuses on the larger terrestrial species and on the destruction of rainforest and coral reef habitats. Many freshwater habitats, however, are also under serious threat,

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and an abundance of aquatic organisms face imminent extinction.

A wide range of aquatic animals, including fish, crustaceans, and shellfish in fresh water ecosystems are increasingly threatened by a variety of human activities. The intentional introduction of foreign aquatic species as ornamentals, for aquaculture, for sport, and for biological control purposes have also impacted upon native aquatic species; as have accidental introductions of exotic species.

Many exotic species were introduced with little forethought of their possible effects on native aquatic biotas and on

freshwater ecosystems. Of serious concern is the extinction or the local extirpation of native species by exotic invaders. Such losses are not only depleting our natural heritage, but sometimes result in the loss of native organisms of potential usefulness.

Although very little is known about the ecology of Melanesian streams, freshwater species are a major source of protein for rural Pacific Islanders both living on the coast and especially for those living far inland

There has been little study of the ecology and possible utilization of native freshwater species in Melanesia. The



Freshwater surveys, Fiji **left:** Students of USP. **Far left:** *Sicyopus zosterophorum*, Fiji. **Right:** Waitavala creek, Taveuni, Fiji. **Below right:** *Stiphodon rutilauneus*, Fiji.

freshwater fishes are poorly known and isolated high islands of Melanesian possess several undescribed locally endemic species. Therefore it is important to survey the freshwater fish resources of Melanesia before the impacts of land development, deforestation, mining and of exotic species

affect them. It would be unfortunate if the Melanesian situation deteriorated to a state like that of New Zealand where large-scale deforestation, farming and the introduction of exotic species like trout, have caused major ecological changes to freshwater habitats. In Melanesian we urgently need to describe our native freshwater fauna before it is too late. The biodiversity of Melanesian streams needs to be fully described now because of increasing threats to the existing fauna.

A summary of the total number of endemic and total number of fish fauna in Melanesian countries is presented in Table 1.0.

Low numbers of endemics and freshwater fish fauna in some of the Melanesian countries can be attributed to lack of freshwater fish research being carried out there and therefore, may not reflect true numbers.

PNG records the highest number of freshwater fish due to the extent of the freshwater fish surveys that have been carried out there. The freshwater fish reported from Solomon Islands is a result of two collections made by Gray in 1974

on the island of Guadalcanal, and a preliminary survey by Gerry Allen in 2004. Less work on freshwater fauna was also carried out in Vanuatu and New Caledonia. Fiji currently records the second highest biodiversity behind that of PNG as a result of our studies on the Fijian freshwater fishes.

Statutory regulations have been set in place by Melanesia countries for the management of their native resources within their jurisdictions. The purpose of these regulations is to ensure some form of control on development including the introduction of exotic species, so that the native species survive and yield benefit to the island communities. The enforcement or lack of these regulations is, often based on little knowledge of the local fauna. As well as trying to anticipate what some of the likely environmental effects of introduced freshwaters species might be, there is a need to investigate the commercial potential of indigenous Melanesia species for aquaculture, sport fishing, rather than always turning first to the importation of exotic organisms.

Freshwater ecosystems are as important as the terrestrial and the marine ecosystems because they are the link between the land and the sea. Therefore, stakeholders from the lands, forestry and

fisheries departments should work with resource owners for effective management. Once the aquatic environments are protected it will take care of the whole ecosystem.■

Country	Endemics	Total Fauna	% Total	Sources
PNG	60	329	18.2	Allen 1991; Allen 2003; Fishbase 2004
Solomon Is	0	60	0	Gray 1974; Gerry Allen, pers. comm.; Fishbase 2004
New Caledonia	10	64	15.6	Marquet et al. 2003; Fishbase 2004
Vanuatu	5	60	8.3	Ryan 1986; Nimoho 2000; Fishbase, 2004.
Fiji	10	161	6.2	David Boseto, 2005

Table 1.0 Total endemics and total freshwater fish fauna of Melanesian countries.

