



# Hillstream loach

(*Swellia lineolata*)





## General Introduction

Vietnam belongs to the global hotspots of biodiversity and is a megadiverse country. Discoveries of new species are regularly reported from it.

Across Vietnam's vertebrate species, freshwater fish species are some of the most poorly known about. Currently, there are nearly 700 freshwater fish species reported from the country, amounting for 4 % of the world's known freshwater fish diversity. More than 30 % of the freshwater fish from Vietnam are endemic to the country and 7 % (or 49 species) are evaluated as threatened, and most of them (45 species) have decreasing population status. For more than half of Vietnam's freshwater fish species, natural history and threat information are lacking: 115 species are not evaluated, and 232 are listed as data deficient by the IUCN Red List. Clearly, action is required here to fill the knowledge gaps and to define conservation priorities.

## Biology

The Hillstream loaches or river loaches are a family of small fish from South, Southeast and East Asia. The family Balitoridae includes more than 200 species. They are also known as "lizardfish" or "flossensaugers". Many of the *Sewellia* species are popular for aquaria, they are most commonly sold in the aquaria trade.

Most species are rheophilous, living in swift, clear and well-oxygenated streams. Several species of the family live in fast-flowing streams or torrents and have modified ventral fins used for clinging to rocks.

The Hillstream loach inhabits rapids and riffles. It is a rheophilous species, found in small to medium-sized rivers and streams with large and deep pools covered by submerged plants, provided that small riffles are present between these pools. It occurs also in high gradient streams, consisting almost exclusively of waterfalls and in larger rivers, at the upper extremity of riffles.



The species is endemic to central Vietnam and can be found in coastal rivers in central Vietnam from Thua Thien – Hue Province southwards to Binh Dinh Province.

The Hillstream loaches feed on benthic invertebrates and algae. They are active during daytime searching in the periphyton on both horizontal and vertical surfaces of stones for food. Commonly found in aquarium trade and also present in zoo collections, it is also bred by some zoos in Europe.

The Hillstream loach can reach 57 mm in size. It can be distinguished from the other species in the genus from central Vietnam by 3-5 distinct dark stripes on the body.

## Status

Major threats to this species are overfishing, habitat degradation through dam construction, and siltation caused by deforestation practices. It is listed in the IUCN Red List as Vulnerable, with decreasing natural populations.

## Conservation action

As microendemic species, the Hillstream loach is particularly threatened by habitat alteration and human disturbances. Population and habitat status should be evaluated and fitting conservation measures deduced from that. In country conservation breeding should be established based on topotypic, pure *S. lineolata*, to build up an assurance colony in Vietnam.

## Campaign objectives

To expand conservation measures for the Hillstream loach, the EAZA Vietnam campaign will foster:



- monitoring of population and habitat trends;
- study population size, life history, and threats;
- survey(s) at the type locality to secure topotypic founders for build up of a pure in country breeding colony.

As the Hillstream loach also stands for threatened freshwater fish species and at the same time threatened ornamental fish species from Vietnam, this also will be a trial model for in-country conservation breeding for other threatened freshwater fish species from Vietnam.

Thus, to expand conservation measures for threatened freshwater fishes from Vietnam, the EAZA Vietnam campaign will further foster:

- build up of assurance colonies / conservation breeding of threatened fish species from Vietnam at different places (e.g., SIE, WAR);
- field surveys for getting in country conservation breeding programs of threatened freshwater fish taxa started.

This also fits with the current approach by IUCN SSC Asian Species Action Partnership Singapore (A strategic framework to accelerate urgent conservation action for ASAP Freshwater Fishes in Southeast Asia). Therein, nine species from Vietnam are listed as ASAP species, among them also two *Sewellia* species, with conservation actions being surveys, habitat protection, ex situ breeding to establish assurance populations, research into the impacts and opportunities related to the aquarium trade.

European zoos that keep hillstream loaches, can furthermore highlight the importance of freshwater fish research and conservation in Vietnam.



Breeding population of Hillstream loach (*Sewellia lineolata*) at the Cologne Zoo. Phot. T. Ziegler