

Melanotaenia of New Guinea

A Crisis on the Horizon? Or One Already Here?

Part II

by Derek P.S. Tustin



Last month I wrote about the background of the Sahul rainbowfish, what Sahul is, how rainbowfish came to be in New Guinea, and the division of *Melanotaenia* species between Australia and New Guinea. I concluded by briefly examining both the IUCN Red List of Threatened Species and the CARES Preservation Program Conservation Priority Species at Risk List, and mentioned the five species of *Melanotaenia* that appear on both. This month I'll give you an in-depth examination of those five species, how they feature on both the IUCN Red List and in the CARES Preservation Program, and how we should be examining the conservation status of *Melanotaenia* species going forward.

A Bit About Each and Why They Are On The List

I'll admit that I've looked at the CARES Preservation Program over the years, focusing mostly on the *Melanotaenia* species, but never really took the time to understand why the respective species are on the list. Having now done so, I think that understanding why a species is on the list is just as important as simply knowing that it is endangered. With that, let me give you a bit of information about the five referenced New Guinea *Melanotaenia* species.



***Melanotaenia arfakensis*¹**

Dr. Gerald Allen originally collected *Melanotaenia arfakensis* in 1989, having found them in the Prafi River, about 20 to 30 kilometers west of Manokwari, the largest (and now capital) city of the Indonesian province of West Papua. The following year he described them, giving them the name of "arfakensis," or literally "From Arfak," referring to the Arfak Mountains, which border the Prafi River and tributaries on the western side. The same year they were being described, Heiko Bleher collected live specimens and introduced them to the rainbowfish

community. Unfortunately, they have not become established in the North American hobby and are quite difficult to come by.

When available, they are commonly referred to as the "Arfak rainbowfish" and are considered to be a moderately sized rainbowfish, with males reaching a maximum size of 4" (10 cm) and the females around 3" (8 cm). They are a silvery colored fish, with a mauve tinge to the upper portion of the body and a whitish silver coloration on the lower half. They have a pronounced mid-lateral stripe, one scale in width and of a black/blue color that extends the length of the body. The second dorsal fin has a dark sub-marginal band that is edged in white on the edge of the fin. The caudal fin can range from yellow to white with a dark margin on the upper and lower surface of that fin. As is common with most rainbowfish, the male is more colorful and deeper bodied than the female.

Most often found in streams near sub-surface vegetation, they have also been located in lagoons and swamps. While initially discovered in the Prafi River, they have subsequently been found in the Warmare, Aimasi and Nimbai Rivers (all tributaries of the Prafi River), and also in the Kebar, Nuni, Asiti, Appi and Atai Rivers amongst others.

***M. arfakensis* on the IUCN Red List of Threatened Species**

Melanotaenia arfakensis is listed as Vulnerable on both the IUCN Red List of Threatened Species and the CARES Preservation Program Conservation Priority Species at Risk List. The IUCN Red List entry records that the habitat of *M. arfakensis* has been drastically altered due to the development of the oil palm industry, and that at least one exotic species (identified only as "walking catfish," but which is likely *Clarias batrachus*) may pose a threat to the population.

For those of you unfamiliar with it, palm oil is an edible vegetable oil derived from the fruit of the oil palm plant, usually the African oil palm, *Elaeis guineensis*. It is a very common crop in Indonesia, with over 1,500,000 small farmers growing the crop. It is up to ten times more productive on a per unit of area basis than soybeans or sunflowers. However, palm oil is also a very serious ecological concern. Deforestation to provide space for oil palm plantations

is ruining habitats and ecosystems, and oil palm plantations are being placed in riparian areas, resulting in both the destruction of the habitat and pollution of the water in the area.



*Melanotaenia boesemani*¹

Without a doubt, the most recognizable of all rainbowfish is *Melanotaenia boesemani*. They were originally collected from Lake Aitinjo by the renowned Swedish zoologist Sten Bergman during the Swedish New Guinea Expedition of 1948/1949, and specimens were returned to the Swedish Museum of Natural History, where they remained unstudied.

Just over five years later, Dr. Marinus Boeseman participated in the Rijksmuseum van Natuulijke Historie (RMNH) [the National Museum of History] expedition to Netherlands New Guinea, which spanned the period of October 1954 to May 1955. Dr. Boeseman had received a request from the Netherlands New Guinea government to perform a survey of the freshwater fishes of western New Guinea, and in the company of Dr. Leo Brongersma (a noted Dutch zoologist and herpetologist) and Dr. Lipke Holthuis (a noted Dutch expert in carcinology, which is the study of crustaceans), and with the support of the Royal Netherlands Navy and various missionary groups (the Dutch Reformed Church, the Roman Catholic Church, and the Christian and Missionary Alliance), he surveyed numerous lakes and rivers, including Lake Aitinjo, Lake Ajamaru, Lake Jamoer, Lake Sentani, the Wissel Lakes (consisting of Lake Paniai, Lake Tage, and Lake Tigi), the Digul River, the Maro River, the Tami River, and Biak Island. In a relatively brief period of time a collection totaling 2,124 specimens was gathered and returned to the RMNH. Amongst the specimens gathered were 59 specimens of the fish we know today as *Melanotaenia boesemani*. But once again, the specimens remained unstudied.

In 1975 and again in 1977, Dr. Gerald Allen was preparing for a revision of the rainbowfish family, and as part of that preparation he studied the specimens gathered during the RMNH expedition of 1954/1955. During that examination, he found four species of rainbowfish that had never been scientifically described. In 1980 Dr. Allen, working with Norbert Cross, published a paper wherein these

species were named *Melanotaenia ajamaruensis*, *Melanotaenia japonensis*, *Glossolepis pseudoincisus* and... *Melanotaenia boesemani*.

Two years after they were described, Dr. Allen and Heiko Bleher gathered live specimens, which were transported to Europe and Australia and subsequently released into the hobby. Heiko Bleher made another collection in 1998, and those fish followed their predecessors into hobbyist aquariums.

Commonly called “Boeseman’s rainbowfish” or sometimes “Boesie’s,” the fish are visually different from all but one other species of rainbowfish. The front portion of the fish and the head is a blue color (ranging from bluish grey through to a dark blue), and the back half of the body is bright orange to red in color. (Another fish, *Melanotaenia ajamaruensis*, shares the bifurcated blue/orange coloration, but differs in soft ray counts for the second dorsal and anal fins, and has more prominent lateral stripes, especially the mid-lateral stripe and the one immediately below.) They are moderately large, reaching a maximum size of 5” (12 cm) in length, although in captivity they tend to reach a maximum size of approximately 4” (10 cm). Males are more colorful and deeper bodied than the females.

They are mostly found in Lake Ayamaru and the surrounding tributaries, but have also been found in Lake Hain, Lake Aitinjo, and possibly Lake Uter.

***M. boesemani* on the IUCN Red List of Threatened Species**

The IUCN Red List records *Melanotaenia boesemani* as being Endangered (very high risk of extinction in the near future), but oddly the CARES Preservation Program Priority Species at Risk List only lists it as being Vulnerable (very high risk of extinction in the medium term future). The CARES Preservation authority is listed as being Dr. Paul V. Loiselle. There is not much of a discrepancy, but seeing as it is the only *Melanotaenia* species not using the IUCN Red List as the primary authority, it is interesting to note, and I suspect that the IUCN Red List may have been updated since last reviewed by Dr. Loiselle.

One area of concern that is noted is that the water levels in one or more of the lakes where *Melanotaenia boesemani* is found are subject to broad fluctuations, with related changes in the habitat. But the IUCN Red List goes on to note that the main threat to the species is the harvesting and export of fish (mainly males) for the aquarium trade. It has been estimated that as many as 1,000,000 fish are caught per year. Personally I find this number a bit high. Other sources state that in 1989 approximately 60,000 fish were being caught each month (or 720,000 per annum), but that less than half were actually surviving export. It is reported that the Indonesian government eventually stepped in and placed some controls on the export of *Melanotaenia boesemani*, which likely has had a very beneficial impact in the short term.



Melanotaenia lacustris¹

The entire island of New Guinea has undergone multiple foreign cultural invasions since the late 1800s. The British, the Germans, and the Dutch had at one time laid claim to parts, and at the outbreak of World War II the Japanese invaded the island. At the end of the war in 1949, the former territories of Papua and New Guinea were merged under the international trusteeship system of the United Nations and were placed under the administrative control of Australia. The trusteeship system was a method by which the United Nations sought to ensure that former colonies were looked after, with the intention that in the future they be returned to their inhabitants for self-government. In 1975, after 26 years of being under the care of the Australian government, Papua New Guinea gained its independence.

During the time of the administration of the Territory of Papua and New Guinea, the Australian government employed Patrol Officers to oversee the country. These officers were tasked with bringing “modern civilization” to the country in the form of governance, law and order, and the introductions of a postal system, radio communications, and infrastructure including the placement of roads and airstrips. As can be imagined, those who served as Patrol Officers were at heart adventurers, and such adventure included the exploration of the country they were safe-guarding. One such officer was Charles Edward Timothy Terrell, who served in the Lake Kutubu Sub-District of the Southern Highlands District from 1952 until 1956. In 1955 he discovered this species in the area where he was assigned, and forwarded preserved specimens to the noted Australian ichthyologist Ian Munro. Almost a decade later, in 1964, Ian Munro described the fish as *Melanotaenia lacustris*. “Lacustris” is derived from the Latin words “lacu,” meaning “lake,” and “ustris,” meaning “from,” giving a literal translation of “From a Lake.”

Another two decades passed, and in 1983 Dr. Gerald Allen, John Paska, and Barry Crockford travelled to Lake Kutubu and gathered approximately 40 live fish. Only 10% of the fish survived the return trip to Australia, and the only surviving male succumbed to hookworm shortly thereafter. It took another three years before Heiko Bleher successfully gathered living stock, and two years later, in 1988, he and Dr. Allen made another successful collection. It didn't take long for them to be released into the hobby.

Occasionally referred to as “Lake Kutubu rainbowfish,” they are most often found in the hobby being referred to as “turquoise rainbowfish” in reference to the bluish green color of the fish. The coloration can actually vary from very dark tones of blue through to lighter shades of turquoise. Similar in size to *Melanotaenia boesemani*, males may reach 5” (12 cm) in size, but most often grow to 4” (10 cm). Again, males are deeper bodied and more vibrant in coloration.

Located about 50 kilometers southwest of Mendi, the capital city of the Southern Highlands province of Papua New Guinea, Lake Kutubu is the second largest lake in the country (Lake Murray being the largest). It has a surface area of just under 50 km², and is known for being exceptionally clear. However, the most interesting fact about the lake is that it is home to at least 13 species of endemic fish, including *Melanotaenia lacustris*. In addition to being found in the lake proper, *Melanotaenia lacustris* have also been found in the Soro River, the only outlet stream of the lake.

***M. lacustris* on the IUCN Red List of Threatened Species**

Listed as Vulnerable on both the IUCN Red List and the CARES Preservation Program Priority Species at Risk List, *Melanotaenia lacustris* is another species that it is endangered due to environmental changes being brought by increased development in the local area.

Oil Search Limited is the largest oil and gas exploration and development company incorporated in Papua New Guinea. In 1992 Oil Search Limited began production at the Kutubu Oil Project, which is located near Lake Kutubu. As a result of the production facilities being located there, the local population increased with migration to the area. This in turn led to an increased demand for both resources and space, which then led to forest destruction and loss of habitat to provide space for businesses and housing, pollution from the increased population, and increased demand for food. The increased demand for food resulted in both an overfishing of the species found in the lake, as well habitat destruction through the use of both gill nets and outboard motors in that overfishing.

We all have our “dream fish,” the one that we really want to keep, but will forever have difficulty in acquiring. *Melanotaenia oktediensis* is that fish for me. I've been lucky enough to have once imported eight fry from a fellow hobbyist in Europe, but was unable to get them to breed. Still, I hold out hope to get some more one day, and am working to see if I can get any exported from hobbyists in Australia.

This fish is endemic to the Ok Tedi River and associated tributaries in the western portion of Papua New Guinea. They were first collected in July 1974



***Melanotaenia oktediensis*²**

by Dr. Charles Boyden (who was participating in the University of Cambridge's expedition to the Western District of Papua New Guinea) from Karamonge Creek, a small tributary of the Ok Tedi River. He returned with two females that at that time were an undescribed species, and deposited the preserved specimens with the Papua New Guinea Fisheries Department.

The next year Dr. Tyson Roberts, participating in the Smithsonian's International Environmental Science Program, undertook a comprehensive ichthyological survey of the Fly River drainage network, of which the Ok Tedi River constitutes a part. On November 1st, 1975, he collected one sample of a female *Melanotaenia oktediensis*, but mistakenly believed it to be *Melanotaenia vanheurni*.

In 1980 Dr. Gerald Allen and Norbert Cross published **Descriptions of Five New Rainbowfishes (*Melanotaeniidae*) From New Guinea** based in part on his examinations of the specimens preserved by both Dr. Boyden and Dr. Roberts. Included therein was the first description of *Melanotaenia oktediensis*. Two years later Dr. Allen returned to the area and collected live specimens, which were distributed into the global hobby. Unfortunately, they failed to gain a foothold, and today are extremely rare, with a small captive population in Europe and another in Australia.

Once again similar in size to *Melanotaenia boesemani*, the "Ok Tedi rainbowfish" has a coppery brown body coloration on the upper half of the body, a mauve to white coloration on the lower half, and a prominent mid-lateral line separating the two.

***M. oktediensis* on the IUCN Red List of Threatened Species**

Have you ever heard of the Ok Tedi Environmental Disaster? That is the cause, and the sole cause, of *Melanotaenia oktediensis* being listed as Vulnerable on both the IUCN Red List and the CARES Preservation Program Priority Species at Risk List.

The Ok Tedi Mine is an open-pit gold and copper mine located near the headwaters of the Ok Tedi River. Situated in a remote area of Papua New Guinea, it is very close to the Indonesian/Papua New Guinea

border. Intense mineral exploration of the area began in the 1970s, and the following decade BHP Billiton secured a mining lease. They initially found a gold deposit, and after depleting the gold targeted a copper deposit (at the time was believed to be the largest in the world) located beneath the gold.

Since the mine was established until present, an estimated 2,000,000,000 (that's two *billion*) tons of mine waste have been discharged into the Ok Tedi River. An estimated 579 mi² (1,500 km²) of forest has died (greater than the area of New York City), and another 1158 mi² (3,000 km²), or the equivalent of Rhode Island, may eventually be harmed.

Chemicals included in the mine waste have either contaminated fish or killed them outright. Fish that are only contaminated continue to be caught and consumed by the native inhabitants, passing the chemicals on to the human population. Further, the material dumped into the river surpasses the amount that can be transported away by the river, resulting in the river bed having risen an estimated 32' (10 m). This in turn has turned a river that was once deep and fast flowing, into one that is shallow, slow, and that has developed rapids. The slower river is now inclined to flood, leaving behind deposits of contaminated mud on the river banks, which is where the native population plant taro, sago palms, and bananas for food crops. These food sources are then tainted by the contaminated mud, once again resulting in the toxins being ingested by humans.

While there is a counterbalancing effect on the local population when the quality of health care, education and infrastructure that accompany the mine are considered, there is no way to underestimate the severe devastation that has been wrought on the local environment, including *Melanotaenia oktediensis*.



***Melanotaenia parva*¹**

During the same expedition that saw Dr. Allen discover *Melanotaenia arfakensis*, he found two other species of Sahul rainbowfish, *Melanotaenia angfa* (named in honor of ANGFA – the Australia and New Guinea Fish Association), and *Melanotaenia parva*. The latter has become another of the most popular and sought after Sahul rainbowfish.

It is found only in a small lake on the isthmus that links the Vogelkop Peninsula (commonly called

the Bird's Head Peninsula) to the rest of New Guinea. Sources cite the lake as being "Lake Kurumoi," but very little information is actually available about the lake itself. (In fact, if you enter "Lake Kurumoi" as a search in Google, it isn't until the 5th page that you get an entry that isn't about *Melanotaenia parva*.) A little additional research reveals that the geographic coordinates of the lake are approximately 2°10'S, 134°05'E, and there is indeed a lake shown on maps at that location, measuring approximately 1,640' (500 m) by 2,625' (800 m). However, other sources identify the body of water as Danau Rundiepi (Danau being the Indonesian word for "lake").

Regardless of the actual name of the lake (and with multiple languages being spoken, it is completely understandable as to why there are at least two names for the same body of water), it is agreed that *Melanotaenia parva* is endemic only to this body of water. The fish that Dr. Allen collected were noted to be "bluish to mauve with a black midlateral band, or silver with red specking and narrow red or orange lines between each scale row on the side of the body. Fins of both varieties were red." However, in captivity the males tend not to appear blue, rather having a brilliant red coloration when mature. While the species name "parva" means "small" in Latin, they are actually a mid-sized example of the *Melanotaenia* genus, reaching a maximum size of 4" (10 cm). In the hobby you will occasionally (and only very occasionally at that) see them called "Lake Kurumoi rainbowfish," "flame rainbowfish," "sunset dwarf rainbowfish" or "dwarf flametail rainbowfish," but will most often find them being sold as either Parva rainbowfish or *Melanotaenia parva*.

***M. parva* on the IUCN Red List of Threatened Species**

During his initial visit to Lake Kurumoi/Danau Rundiepi, Dr. Allen found that *Melanotaenia parva* were very abundant. However, they are now listed as Vulnerable on both the IUCN Red List and the CARES Preservation Program Priority Species at Risk List. The IUCN entry for *M. parva* informs that they are now listed as such due to "severe habitat alteration caused by an infestation of tilapia."

For those of you unfamiliar with tilapia, they are a group of cichlid that are considered to be extremely adaptable and are able to thrive in a wide variety of habitats. Part of this is due to a proclivity to breed quickly, and a very fast rate of growth to a relatively large size. This results in them both preying upon and outcompeting native fish for resources.

Historically they have been introduced into foreign habitats as a control for invasive plants (which they readily feast upon), and as a food fish. When or why they were introduced to Lake Kurumoi/Rundiepi is not known, but now that they are there, their presence is being felt.

***Melanotaenia*, the IUCN Red List and the Future...**

So that is the basic information on the five *Melanotaenia* species that are captured on both the IUCN Red List and the CARES Preservation Program Priority Species at Risk List. However, if you do visit the IUCN Red List (and I strongly encourage that you do, if just to become more familiar with the program) and search "*Melanotaenia*," you will not only see information on these five species of the *Melanotaenia* genus, but also information on three other genera where "*melanotaenia*" appears as a species name and a listing of 19 other species in the *Melanotaenia* genus.

One of these is the aforementioned *Melanotaenia eachamensis*, leaving another 18 species that do not appear on the CARES Preservation Program Priority Species at Risk List.

By IUCN Red List Classification Code and country of origin, they are:

Near Threatened:

New Guinea

Melanotaenia pygmaea

Australia

Melanotaenia gracilis

Least Concern:

New Guinea

Melanotaenia catherinae

Melanotaenia iris

Melanotaenia maylandi

Melanotaenia misoolensis

Melanotaenia papuae

Australia

No species listed

Data Deficient:

New Guinea

Melanotaenia ajamaruensis

Melanotaenia angfa

Melanotaenia corona

Melanotaenia herbertaxelrodi

Melanotaenia ogilbyi

Melanotaenia pimaensis

Melanotaenia praecox

Melanotaenia sexlineata

Melanotaenia vanheurni

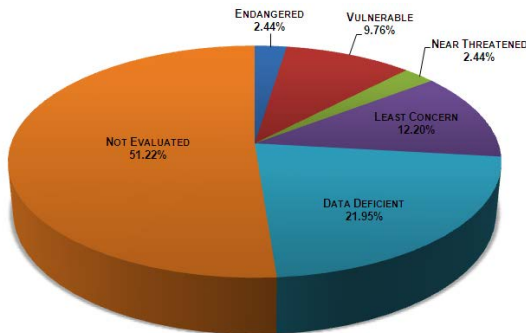
Australia

Melanotaenia exquisita

As mentioned, there are currently 49 species of *Melanotaenia* known to exist in New Guinea (excluding *Melanotaenia maccullochi*). I have described five species, and the above listings contain an additional 15 species, giving us 20 species of New Guinea *Melanotaenia* species that appear in the IUCN Red List.

That leaves 29 species of New Guinea *Melanotaenia* that do not appear on the IUCN Red List. According to the IUCN Red List website, the Red List is “updated at least once each year.” But, to be generous, let’s assume that the list hasn’t been updated since 2010. There was one new species of New Guinea *Melanotaenia* described in 2010, two new species in 2011, four species in 2012 and one in 2013. So that’s eight species where, being generous, people conceivably haven’t gotten around to evaluating their status and entering it into the IUCN Red List.

But that still leaves 21 species of New Guinea *Melanotaenia* that do not appear on the IUCN Red List, and where their threat of extinction has not been evaluated. So approximately 40% of all known New Guinea species discovered between 1875 and 2008 have **not even been evaluated** for their threat of extinction. If you add in the nine species listed as being “Data Deficient” on the IUCN Red List, you have 30 species of 41 (considering the eight species described since 2010), or three quarters of the species, where not enough or nothing is known about their status.



Melanotaenia of New Guinea - IUCN Red List Status

Why?

“There are secrets still untouched in the heart of New Guinea – more gold to be found, more oil, rivers to be traced, unconquered mountains to be climbed, large areas of unknown country to be visited, where one may discover races and customs unlike any hitherto known to man...”

That’s why... and that quote, which was taken from an article written by Beatrice Grimshaw and published in The New York Times on February 4th, 1923, still holds true today.

Circling back to where I began, New Guinea is less than 0.5% of the surface of the Earth but has an estimated 5% to 10% of the total species in the world. Two countries, but both with thousands

of separate communities within their borders, and those communities divided by history—by language, by tradition, and by customs. Geography that is incompatible with easy exploration and that doesn’t have the infrastructure for people to easily move around. Politics, history, geography, and the lack of infrastructure combine to provide an island that is little known.

But for all it is a country where little is known about the ecosystem, we must all realize that it is a country that is in the process of destroying parts of itself through “development.” We can’t sit in judgment as we bask in the benefits of living in first world nations. We just can’t understand the benefits that a new and readily available source of food, a new school, or even a paved road can bring, nor can we begrudge people wanting to have a better life that can be given through the provision of those. But we can recognize that damage is being done, and take a small step to save a portion of that island for the future.

Back to *Melanotaenia* and the CARES Preservation Program

The CARES Preservation Program uses the IUCN Red List as a primary source for identifying fish that need to be part of a preservation or conservation program. Nothing on their website or in conversations with my local club’s CARES Preservation Program Coordinator has clarified how fish are added that do not appear on the IUCN Red List. By inference from the information available, it appears that there are individuals who are “Regional Coordinators” for the Priority Species at Risk List who oversee a specific geographical region (e.g. Madagascar, Lake Tanganyika, or Central America) and individuals who are “Group Coordinators” who oversee a family of fish (e.g. Anabantidae, Cyprinidae or Poeciliidae). It appears that these are responsible for the selection and inclusion of fish from a region or family onto the Priority Species at Risk List.

However, there is no Regional Coordinator for New Guinea, Australia or Sahul, and there is no listed Group Coordinator for *Melanotaeniidae* or *Pseudomugilidae*. In fact, the only name that appears on the CARES Preservation Program website that is strongly associated with rainbowfish is Gary Lange, who is listed as a “CARES Program Specialist.”

To me, finding an individual or individuals to fill this role is the first step required to ensure that the CARES Preservation Program includes fish from one of the world’s greatest at-risk regions. While it is tempting to suggest that individuals who are renowned within the rainbowfish community such as Dr. Gerald Allen (the aforementioned scientist and author of **Rainbowfishes: In Nature and in the Aquarium**) or Adrian Tappin (founder of the **Home of the Rainbowfish** website and author of **Rainbowfishes: Their Care & Keeping in Captivity**) be approached,

it makes more sense for the CARES Preservation Program to formally ally itself with the global authority on rainbowfish, the Australia and New Guinea Fish Association (ANGFA). Nowhere else is there an organization that includes some of the foremost authorities on the Sahul rainbowfish of the *Melanotaeniidae* and *Pseudomugilidae* families. In fact, ANGFA has implemented a Species Maintenance Group for Sahul rainbowfish, and being able to share that information between ANGFA and the CARES Preservation Program would provide a comprehensive base for including Sahul rainbowfish in the CARES Preservation Program Conservation Priority Species at Risk. I know that preliminary conversations have taken place between the two organizations, and it is my fervent hope that a formal alliance can be achieved to ensure that the unique and endangered fish of Sahul are fully included within the CARES Preservation Program.

But while waiting for a Regional Coordinator or Group Coordinator to be appointed, or for a formal alliance between CARES Preservation Program and ANGFA to occur, I would suggest to each and every one of you that you treat **all** species of *Melanotaenia*, *Glossolepis*, and *Chilatherina* that you encounter as likely CARES Preservation Program fish. With the majority of Sahul rainbowfish available in the

hobby being from New Guinea (Australia regulations make the export of native Australian species almost impossible), with the number of new species being released into the hobby that haven't yet been evaluated for inclusion on the IUCN Red List, with the number of *Melanotaenia* (and *Glossolepis* and *Chilatherina*) species that are missing from the same list, and with the number of species that appear as "Data Deficient," it is likely that some (many?) of the species will appear on the list in the future.

Melanotaenia are a passion of mine. Unlike a member of my local club (who is heavily involved in the CARES Preservation Program), I don't believe that they are simply "cichlid food." They are beautiful and unique species from endangered ecosystems in an unexplored part of our world, and deserve just as much conservation, awareness, recognition, encouragement, and support as any other family, genus, or species of fish. It is my hope that going forward, many of you will also recognize the need for them to be preserved, and find room in your fishroom for a tank of these beautiful fish.



¹ Photos from Gary Lange.

² Photo from Rainbowfish.org.



CAMEO PET SHOP

TROPICAL FISH AQUARIUM

Specializing in Tropical Fish and Aquarium Supplies

Large Selection of Aquatic Plants

Knowledgeable Staff

Same Location Since 1947.

(718) 849-6678

115-23 Jamaica Avenue
Richmond Hill, NY 11418