Acta Biol. Venez., Vol. 19 (1): 17-50
Marzo, 1999

DIVERSITY AND ABUNDANCE OF FISHES AND HABITATS IN THE RIO TAHUAMANU AND RIO MANURIPI BASINS (BOLIVIA)

DIVERSIDAD Y ABUNDANCIA DE PECES Y HABITATS EN LAS CUENCAS DE LOS RIOS TAHUAMANU Y MANURIPI (BOLIVIA)

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ABSTRACT

Fishes were collected at 85 stations in the Rio Tahuamanu and Rio Manuripi basins. These basins were divided into five subregions. The physical features, number of species, number of specimens, and taxa present for each station are used as a basis for a brief description of each region's fish community.

RESUMEN

Peces fueron colectados en 85 estaciones en las cuencas de los ríos Tahuamanu y Manuripi. Estas cuencas fueron divididas en cinco subregiones. Los aspectos físicos, número de ejemplares y taxa presentes en cada una de las estaciones ha sido usada como base para una descripción de la comunidad ictícola de cada región.

Keywords: Freshwater Fish Community, Bolivia, diversity, abundance, conservation

Palabras Clave: Comunidades icticolas continentales, Bolivia, diversidad, abundancia, conservacion

INTRODUCTION

Conservation of biodiversity in aquatic ecosystems is one of the most difficult and important challenges facing the world today (Aquarap, 1997, 1999; Chernoff et al., 1996). The challenges lie in the current base of knowledge, current uses of aquatic ecosystems for human activities and consumption, and current models for management and conservation (Gleick, P., 1998; IUCN, 1993 WWF-IUCN, 1994). The biodiversity of aquatic habitats ranks among the most poorly known, especially in tropical and subtropical regions. The lack of knowledge includes both the basic systematics, taxonomy and phylogenetic relationships of organisms (Böhlke et. al., 1978; Chernoff et. al., 1991; Fink & Fink, 1978; Mago-Leccia, 1978, 1994) and their ecologies (Goulding, 1979; Lundberg et. al., 1979, 1987; Machado-Allison, 1990, 1992, 1993; Menezes y Vazzoler, 1992; Winemiller, 1989). At the best, only cursory information exists on the interactions among organisms, between organisms and their physical environment, and for only a limited number of habitats or temporal seasons (Goulding, 1980, Lowe-McConnell, 1964, 1969, 1987; Machado-Allison, 1993).

Major decisions affecting aquatic ecosystems are being made throughout the neotropics in absence or reliable information (Sisgril, 1990, Machado-Allison, 1994, Bucher et al., 1993), or even an appreciation of the complexities of aquatic ecosystems and the complex life histories of aquatic organisms (Aquarap, 1997).

Conservation of aquatic ecosystems and biotas are important not only from biological and aesthetic perspectives. Aquatic ecosystems are an invaluable renewable resource, capable of feeding a growing population as well as maintenance of a high wildlife and biodiversity in the tropics (Gleick, P., 1998; Aguilera y Silva, 1997).

The area encopassing the Tahuamanu and Manuripi river systems of northern Bolivia has been a largely unexplored region in the upper Rio Madeira river basin. Nonetheless, this region in northern Pando is coming under increasing threat due to human occupation and commercial activities. Large tracts of forests are being converted to pastures for cattle. This habitat convertion increases pressure on both terrestrial, and aquatic ecosystems. For these reasons immediate atention was required (Aquarap, 1999).

Here we present a summary description of the five subregions in the Rio Tahuamanu and Rio Manuripi basins as partial results from the Aquarap Programe. The predominant aquatic physical features are elaborated upon to provide context to the biological information. Number of species and abundance in specified habitats will be used along with comments on particular taxa to synthesize a brief description of each region's ichthyological community. These findings are used as a basis for conservation recommendations.

MATERIAL AND METHODS

Study area. The Tahuamanu and Manuripi rivers join to form the Rio Orthon which after a short distance anostomoses with the Madre de Dios and Beni Rivers. The region is an important transition zone floristically between moister lowland amazonian forests to the north and east and the dryer deciduous forest to the south. The riparian forest communities and vegetation of the floodplain impart a unique character to the rivers and the aquatic communities in this remote section of the upper Madeira river basin. Water in this region in generally white, slighthly acid to neutral and well oxygenated, however some places have black waters, temperatures ranging from 19 to 31 ^{o}C. No signs of pollution (Aquarap, 1999).

The number of localities (Figs 1 & 2) exhibiting particular macrohabitat types and water characteristics for the Upper Rio Orthon basin is given in Table 1.

Fish Collections. Fishes were collected at 85 stations in the Rio Tahuamanu and Rio Manuripi basins (Fig. 2), using standard fishing methods such as beach seines, gill-nets and bottom trawling nets. Each station is described in detail in Appendix I. Latitudes and longitudes are not available for some of the stations due to interference between the GPS units and their appropriate satellites. Identified material are deposited at the Field Museum of Natural History (FMNH, Chicago) and Museo de Historia (Bolivia).

RESULTS

Fishes were sampled at 85 stations and 313 species were collected and identified (Apendix I), of which 91 were new records for Bolivia. This brings the total fish fauna of Bolivia to 641 species and for the Bolivian Amazon to 501 species. This small region in northeast Bolivia contains 62.5 % and 48 % of all species known to inhabit the Bolivian Amazon and Bolivia respectively (Aquarap, 1999).

Following we describe in detail our findings in each of the regions sampled.

Upper Nareuda: 13 Sampling Stations, P2-01 to P2-13.

The region includes small creeks and rivers (1.5 to 8 mts wide). Most have white water and turbid conditions, but there is a *caño* and a black water igarape (Table 2). Sandy/muddy shores and bottoms are common. Presence of grasses and aquatic plants is rare. Some riparian forest is present, particularly along small creeks flowing out of the forests. Water current is dependent upon the area sampled, ranging from swift in the main channel to almost stagnant in *caños*.

The number of species and specimens collected at each station can be found in Appendix I. The number of taxa in small, blackwater rivers ranges from 19 to 33 species (X = 24) and 43 to 425

Figure 1. General Map of the Rio Orthon Basin, showing the Collecting Stations on the Manuripi (▭) and Lower Tahuamanu (+) rivers.

Figure 2. General Map of the Tahuamanu River Basin, showing Collecting Station on the Upper Nereuda (0), Lower Nereuda (**0**), Upper Tahuamanu (▭) and Middle Tahuamanu (▭).

Table 1. Number of localities exhibiting the indicated macrohabitats and water characteristics in the entire Upper Rio Orthon basin

Table 2. Number of localities exhibiting the indicated macrohabitats and water characteristics in the Nereuda sub-basin

specimens (*X*= 131.4). *Caños* range from 8 to 18 species (*X*= 13) and 15 to 119 specimens (*X*= 52.8). In the igarape preto, 26 species and 93 specimens were collected.

The number of species of fishes is low in the small, blackwater rivers. However, there are several species of economic importance, such as: *Knodus gamma, Odontostilbe hasemani*, *Gasteropelecus sternicla*, *Aphanotorulus frankei, Prionobrama filigera*, *Rineloricaria lanceolata*, and *Otocinclus mariae*. Several species of *Apistogramma* and *Aequidens* are very common and always abundant. *Caños*, on the other hand, possess a very low diversity and productivity.

Lower Nareuda: 11 Sampling Stations, P1-11 to P1-21

The region includes a mixture of medium-sized rivers (12-15 mts wide), creeks, rapids, dead arms, and lagoons (Table 2). Sandy/muddy shores and bottoms are common, as well as riparian forest. At some stations, such as creeks flowing out of forests and lagoons, logs and leaves are abundant along the shore. This debris provides important microhabitats for several species of silurids, characoids, and cichlids. Water current is dependent upon the area sampled, ranging from fast in the main channel to stagnant in lagoons and dead arms.

Note: One station (P12) was classified as a white water *curiche*. This is questionable because the field notes contradict themselves by stating that this area is formed from water from the Rio Nareuda, which is a blackwater river.

The number of species and specimens collected at each station can be found in Appendix 1. The single creek sampled had 19 species and 34 specimens. The one rapids sampled had 19 species and 71 specimens. Medium-sized rivers range from 9 to 38 species (*X*= 24.3) and 21 to 147 specimens (*X*= 77.4). Lagoons range from 34 to 43 species (*X*= 38) and 279 to 444 specimens (*X*= 381). Lagoons and dead arms appear to be the most biodiverse and productive areas.

Several groups of species are common and abundant in the rivers and creeks. Examples are *Astyanax abramis*, *Odontostilbe paraguayensis*, *Phenacogaster* spp., *Cyphocharax* spp., *Hypoptopoma joberti*, *Tyttocharax madeirae*, and *Corydoras* spp. The number of important aquarium species increases in lagoons or dead arms. In addition to the species present in the creeks and rivers, there are other groups, such as cichlids and electric fishes, which increase the diversity and the importance of these flooded areas. Some of the additional species are *Apistogramma* spp., *Aequidens* spp., *Moenkhausia* spp., Gasteropelecins, *Mesonauta festivus*, *Agamyxis* sp., *Hypostomus* sp., *Hoplosternum* spp., *Liposarcus disjunctivus*, *Peckoltia arenaria*, *Tatia perugiae*, *Auchenipterus nuchalis*, *Parotocinclus* sp., and *Rineloricaria* spp. The abundance of several species of *Corydoras* together with rare species of *Peckoltia*, *Hypoptopoma*, and *Otocinclus* is significant in light of the popularity of these species in the aquarium trade.

Upper Tahuamanu: 10 Sampling Stations, P1-01 to P1-10)

The region includes large rivers (>70 mts wide), creeks, dead arms, and lagoons (Table 3). Sandy/muddy shores and bottoms are common, as well as riparian forest. At some stations, such as creeks flowing out of forests, logs and leaves are abundant along the shore. This debris provides important microhabitats for several species of silurids, characoids, and cichlids. Water current is dependent upon the area sampled, ranging from rapid in the main channel to stagnant in the lagoons and dead arms. White water predominates (Table 3).

The number of species and specimens collected at each station can be found in Appendix I. The number of taxa collected ranges in creeks from 5 to 30 (*X*= 20.3), in large rivers from 14 to 36 (*X*= 24.3), and in lagoons from 25 to 32 (*X* = 28.5). Specimen abundance showed the following results: creeks, 66 to 136 specimens (*X*= 108.7); large rivers, 25 to 217 specimens (*X*= 115.3); lagoons, 85 to 389 specimens (*X*= 237).

Several groups of species are very common and abundant in the rivers and creeks. Examples are *Astyanax abramis, Odontostilbe* spp., *Prionobrama filigera, Steindachnerina* spp., and

Table 3. Number of localities exhibiting the indicated macrohabitats and water characteristics in the entire Upper Tahuamanu sub-basin

Table 4. Number of localities exhibiting the indicated macrohabitats and water characteristics in the entire Middle Tahuamanu sub-basin

Pimelodella spp. The number of species important to the aquarium trade and utilized for human consumption increases in the lagoons or dead arms. In addition to the species present in the creeks and rivers, there are other groups, such as cichlids and electric fishes, which increase the diversity and the importance of these flooded areas. These additional taxa include *Apistogramma* spp., *Aequidens* spp., *Moenkhausia* spp., *Mesonauta festivus*, *Agamyxis* sp., *Hypostomus* sp., *Hoplosternum* spp., *Liposarcus disjunctivus*, *Potamorhina* spp., *Plagioscion squamosissimus*, *Auchenipterus nuchalis*, *Prochilodus nigricans*, *Pygocentrus nattereri*, and *Hydrolycus* spp.

Middle Tahuamanu:14 Sampling Stations, P2-14 to P2-27.

The region includes small creeks, rapids, and large rivers (up to 100 mts wide). White, turbid water is most common, but a black water igarape was also surveyed (Table 4). Sandy/muddy shores and bottoms are common. Presence of grasses and aquatic plants is very rare. Some riparian forest is present, particularly along small creeks flowing out of the forests. Water current is dependent upon the area sampled, ranging from very fast in the rapids to medium in the main channel.

The number of species and specimens collected at each station can be found in Appendix I. The number of taxa in large rivers ranges from 7 to 29 species (X= 19.4) and 21 to 379 specimens (X= 155.1). In the rapids, 31 species and 185 specimens were collected. The number of taxa in the black-water igarape ranges from 16 to 21 species (X= 18.5) and 74 to 84 specimens (X= 79). The single lake sampled possessed a very low diversity and productivity (20 species and 90 specimens). This area was heavily damaged by logging and cattle ranching.

The most abundant species are *Pimelodella itapicuruensis, Acanthopoma bondi, Pimelodella gracilis, Odontostilbe hasemani, Aphanotorulus frankei,* and a new species of *Megalonema* (one station had 36 specimens of this species).

Manuripi (including Lower Tahuamanu): 37 Sampling Stations, P1-22 to P1-39 and P2-28 to P2-46.

The region includes large rivers (50 to 75+ mts wide), dead arms, and lagoons (Table 5). Sandy/muddy shores and bottoms are abundant. Grasses, aquatic plants, and riparian forests are common near Puerto Rico, but rare elsewhere. Grasses and aquatic plants are most abundant in lagoons and backwaters. Riparian forest is most common along small creeks coming out from the forest. At some stations, such as lagoons or backwaters, logs and leaves can be found along the shore. As pointed out before, this debris provides important microhabitats for several species of silurids, characoids, and cichlids. Water is often black, although the Rio Orthon and Rio Tahuamanu are whitewater rivers (Table 5). Water current is dependent upon the area sampled, ranging from fast in the main channel to stagnant in lagoons and dead arms.

The number of species and specimens collected at each station can be found in Appendix 1. For stations P1-22 to P1-39, the number of taxa in blackwater rivers ranges from 25 to 60 species (X= 44) and 61 to 834 specimens (X= 451). Lagoons range from 23 to 45 species (X= 36.4) and 357 to 1014 specimens (X= 881.7). In the Rio Orthon, 62 species and 332 specimens were collected, whereas 16 species and 40 specimens were collected in the Rio Tahuamanu.

For stations P2-28 to P2-46, the number of taxa in large rivers ranges from 18 to 38 species (X= 30) and 75 to 551 specimens (X= 235). Lagoons range from 21 to 43 species (X= 32.4) and 232 to 1083 specimens (X= 572.2).

Blackwater rivers had the greatest species richness, including several species of economical importance. Examples of species collected in the blackwaters are: *Corydoras loretoensis, Brachyrhamdia marthae, Hemigrammus unilineatus, Amblydoras hancockii, Pyrrhulina vittata, Moenkhausia colletti, M. sanctaefilomenae, Hemigrammus ocellifer, Acanthodoras cataphractus, Carnegiella myersi, Mesonauta festivus, Hypoptopoma joberti, Prionobrama filigera, Rineloricaria lanceolata, Entomocorus benjamini, Apteronotus albifrons, Eigenmannia virescens, Nannostomus trifasciatus*, and *Crenicara unctulata*. Several species of *Apistogramma* and *Aequidens* are also very common and always abundant. A number of important aquarium species were collected in lagoons or dead arms, and the specimens tended to be large.

The area near Puerto Rico has been moderately damaged by cattle ranching. However, species richness is still high in some habitats (e.g. lagoons (cochas)). The most abundant species are *Moenkhausia colletti*, *Moenkhausia lepidura*, *Apistogramma* spp., *Carnegiella*

Table 5. Number of localities exhibiting the indicated macrohabitats and water characteristics in the entire Manuripi sub-basin.

myersi, Doras cf. *carinatus, Opsodoras stubelii, Eigenmannia* spp., *Entomocorus benjamini, Pimelodella gracilis*, *Poptella compressa, Prionobrama filigera, Knodus victoriae, Tympanopleura* sp., and *Rineloricaria* spp. Number of specimens is highest in cochas and lagoons. Electric fishes are common here.

CONSERVATION RECOMMENDATIONS

A general recommendation for all the sub-basins is to maintain the hydrological cycle responsible for the annual flooding which creates and maintains the lagoons and dead arms. These lagoons and dead arms serve as nursery and feeding areas for a large number of fishes. Many of these species are popular in the aquarium trade. An activity that could be promoted is the harvesting or aquaculture of ornamental species. This activity would best be conducted in the isolated lagoons, cochas, or dead arms of the river, and could be a source of income for the local people. Managed properly, this would also help to promote the conservation of the aquatic ecosystem.

Some species such as: *Hoplosternum* spp., *Liposarcus disjunctivus*, *Potamorhina* spp., *Plagioscion squamosissimus*, *Auchenipterus nuchalis*, *Prochilodus nigricans*, *Pygocentrus nattereri*, and *Hydrolycus* serve as a source of food for local people. In this cases biological (life histories) studies have to be promoted to preserve this species. On the other hand these rivers provide water for the local inhabitants.

The Middle Tahuamanu has been severely damaged by cattle ranching. Restoration of the gallery forest and restriction of burning is highly recommended. Ashes may poison the waters.

Blackwater rivers and lagoons of the Manuripi are unique habitats and very fragile. However possesees a very high diversity of aquarium trade species some of them with oustanding prices. Human development in the region has to be regulated. As in the Middle Tahuamanu, restoration of the gallery forest and restriction of burning is necessary.

Promoting sustainable explotation activities among the local people is highly recomended. Study the potential develop local fishery for ornamental species with very high value in the aquarium trade is an example. This activity would best be conduced in the isolated lagoons, cochas or dead arms of the rivers. But population biology and life histories need to be studied to guaranty sustainability as well as a general management plan designed by local authorities with the concourse of the society that depends upon those resources.

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APPENDIX I

DESCRIPTION OF ICHTHYOLOGICAL FIELD STATIONS SAMPLED DURING AQUARAP EXPEDITION TO PANDO, BOLIVIA IN SEPTEMBER 1996.

Group P1

Upper Tahuamanu Sub-Basin (Stations P01-01 to P01-10)

Field Station 96-P-01-01

Locality: Aserradero Rutina 77 km SW of Cobija.11° 25' 55" S, 69° 00' 09" W, 4/Sep/1996.

Whitewater creek (2-3 mts wide, 0.5 mts deep), tributary of the Tahuamanu. It originates in a flooded lake. The shore and bottom are muddy and with abundant submerged logs and leaves. Water current fast. No aquatic plants. Gallery forest covering the margins. A total of 136 specimens were collected.

The species list includes:

Characiformes = 12

Siluriformes = 14

Gymnotiformes = 3

Perciformes = 1

Species total = 30

The most abundant species are *Odontostilbe paraguayensis* (41= 30.1%), *Prionobrama filigera* (16= 11.7%), and *Imparfinis stictonotus* (11= 8.1%). Other species includes: *Farlowella oxyrryncha*, *Astyanax abramis*, and *Eigenmannia virescens*. There is a predominance of fast moving and/or bottom species typical of small, fast water creeks.

Field Station 96-P-01-02

Locality: Rio Tahuamanu, 2 km above Aserradero Rutina.

11° 26' 32" S, 69° 00' 42" W

4/Sep/1996

Whitewater river (> 70 mts wide). It originates in a flooded lake in Peru. The shore and bottom are sandy and with some submerged logs that retain leaves. The current is medium-fast. No aquatic plants. Gallery forest partially covering the margins. A total of 104 specimens were collected.

The species list includes:

Characiformes = 11

Siluriformes = 12

Species total 23

The most abundant species are: *Pimelodella gracilis* (36= 34.6%), *Cheirodon fugitiva* (12= 11.5%), and *Astyanax abramis* (7= 6.7%). Other species includes: *Cheirocerus eques* (6), *Steindachnerina dobula* (5), and *Thoracocharax stellatus* (5). There is a predominance of fast moving and/or bottom species typical of small, fast water creeks.

Field Station 96-P-01-03

Locality: Rio Tahuamanu 2/3 km above mouth of the Muyumanu.11° 26' 21" S, 69° 02' 08" W, 5/Sep/1996

Whitewater creek (50 mts wide). It originates in a flooded lake in Peru. The shore and bottom are sandy/muddy and with abundant submerged logs and leaves. Water current fast. No aquatic plants. Gallery forest covering part of the margins. A total of 217 specimens were collected.

The species list includes:

Characiformes = 19

Siluriformes = 15

Perciformes = 2

Species total = 36

The most abundant species are: *Prionobrama filigera* (91= 41.9%), *Pimelodella gracilis* (19= 8.7%), *Aphyocharax pusillus* (17 = 7.8%), and *Odontostilbe paraguayensis* (11= 5.0%). Other species includes: *Creagrutus* sp. A, *Astyanax abramis*, *Cheirodon fugitiva*, and *Moenkhausia dichroura*. There is a predominance of fast moving and/or bottom species typical of small, fast water creeks.

Field Station 96-P-01-04

Locality: Rio Muyumanu, 1.5 km above mouth of Muyumanu/Tahuamanu. Latitude and longitude unavailable.5/Sep/1996.

Whitewater creek (20 mts wide). The shore and bottom are muddy and with abundant submerged logs and leaves. Water current fast. No aquatic plants. Gallery forest covering part of the margins. A total of 25 specimens were collected.

The species list includes:

Characiformes = 4

Siluriformes = 10

Species total = 14

The most abundant species are: *Creagrutus* sp. A (6 = 24 %), *Prionobrama filigera* (4 = 16 %), and *Imparfinis stictonotus* (3 = 12 %). Other species includes: *Astyanax abramis*, several pimelodids, and loricariids. There is a predominance of fast moving and/or bottom species typical of small, fast water creeks.

Field Station 96-P-01-05

Locality: Rio Muyumanu, same as P1-04. Latitude and longitude unavailable, 6/Sep/1996.

The species list includes:

Characiformes = 2

Siluriformes = 1

Rajiformes = 1

Species total = 4

Collected with gillnet.

A total of 4 specimens were collected. The species are: *Hypostomus* sp., *Mylossoma duriventre*, *Potamotrygon motoro*, and *Serrasalmus rhombeus*.

Field Station 96-P-01-06

Locality: Lake, flooded lake right margin of the Rio Tahuamanu more or less 1000 mts down river from mouth of the Rio Nareuda. Latitude and longitude unavailable, 7/Sep/1996.

Whitewater lake. It originates as a flooded lake, water coming from the Rio Tahuamanu. The lake is used by fishermen. The shore and bottom are muddy and with abundant submerged logs and leaves. No aquatic plants. A total of 85 specimens were collected using nets.

The species list includes:

Characiformes = 21

Siluriformes = 6

Perciformes = 4

Gymnotiformes = 1

Species total = 32

The most abundant species are: *Odontostilbe paraguayensis* (18 = 21.1%), *Astyanax abramis* (8 = 9.4 %), *Eigenmannia virescens* (7= 8.2 %), and *Potamorhina altamazonica*. (6 = 7.0). Other species includes: *Plagioscion squamosissimus, Pimelodus blochii, Aphyocharax dentatus, Odontostilbe paraguayensis, Cheirodon fugitiva, Liposarcus disjunctivus, Ctenobrycon spilurus, Apistogramma* sp., *Auchenipterus nuchalis, Hoplias malabaricus, Hydrolycus pectoralis, Pygocentrus nattereri, Prochilodus nigricans, Serrasalmus rhombeus*, and *Rhaphiodon vulpinus*. There is a predominance of slow moving predators and bottom species typical of lakes or slow water. This lake is used by fishermen. There is a note that said that in 4 hours some fishermen took about 40 kg of fish, including: *Potamorhina altamazonica, Liposarcus disjunctivus, Hoplias malabaricus, Hydrolycus pectoralis, Pygocentrus nattereri, Prochilodus nigricans, Serrasalmus rhombeus,* Doradidae (*Oxydoras* ?), *Rhaphiodon vulpinus*, and *Triportheus* among others.

Field Station 96-P-01-07

Locality: Small creek on Rio Muyumanu, right margin one hour from the mouth into the Tahuamanu. 11° 26' 57" S, 69° 01' 43" W, 8/Sep/1996.

Whitewater creek (1-2 mts wide). The shore and bottom are muddy and with abundant submerged logs and leaves. The water current is medium-fast. No aquatic plants. Gallery forest covering part of the margins. A total of 124 specimens were collected.

The species list includes:

Characiformes = 12

Siluriformes = 4

Perciformes = 1

Species total = 17

The most abundant species are: *Otocinclus mariae* (39 = 31.4 %), *Chrysobrycon* sp. (25 = 20.1 %), *Carnegiella myersi* (12 = 9.6 %), and *Gephyrocharax* sp. (10 = 8.0 %). Other species includes: *Astyanax abramis, Characidium sp., Gasteropelecus sternicla, Moenkhausia sanctae-filomenae*, and *Tyttocharax tambopatensis*.

Field Station 96-P-01-08

Locality: Rio Muyumanu, one hour from the mouth into the Tahuamanu.11° 26' 57" S, 69° 01' 43" W, 8/Sep/1996.

Whitewater creek (15 mts wide). The shore and bottom are muddy. Water current medium-fast. No aquatic plants. A total of 66 specimens were collected.

The species list includes:

Characiformes = 14

Siluriformes = 15

Species total = 29

The most abundant species are: *Aphanotorulus frankei* (6 = 9.0 %), *Prionobrama filigera* (6 = 9.0 %), *Astyanax abramis* (5 = 7.5 %), *Pimelodella* cf. *serrata* (4 = 6.0 %), and *Tatia altae* (4 = 6.0 %). Other species includes: *Odontostilbe hasemani, Phenacogaster pectinatus, Paragoniates alburnus, Sturisoma nigrirostrum, Brachychalcinus copei*, and *Moenkhausia sanctaefilomenae*.

Field Station 96-P-01-09

Locality: Small creek on Rio Muyumanu, left margin half hour from the mouth into the Rio Tahuamanu.11° 27' 35" S, 69o 02' 00" W, 8/Sep/1996

Whitewater creek, tea colored (1 mt wide). The shore and bottom are muddy and with abundant submerged logs and leaves. Water current medium-fast. No aquatic plants. Gallery forest covering part of the margins. A total of 14 specimens were collected.

The species list includes:

Characiformes = 2

Siluriformes = 3

Species total = 5

The most abundant species are: *Characidium* sp. (6 = 43 %) and *Chrysobrycon* sp. (5 = 35.7 %). Other species includes: *Moenkhausia sanctaefilomenae, Otocinclus mariae*, and *Rineloricaria* sp.

Area very difficult to collect.

Field Station 96-P-01-10

Locality: Lake Canaveral. Cocha on left margin of Rio Tahuamanu, 20 min. from the mouth of the Rio Muyumanu. 11° 26' 15" S, 69° 01' 59" W, 8/Sep/1996

Lake formed by an old arm of the river. Abundant macrophytes. Bottom and shore muddy. A total of 389 specimens were collected.

The species list includes:

Characiformes = 13

Siluriformes = 4

Gymnotiformes = 2

Perciformes = 6

Species total = 25

The most abundant species are: *Odontostilbe paraguayensis* (126 = 32.3 %), *O. hasemani* (83 = 21.3 %), *Steindachnerina dobula* (68 = 17.4 %), *Loricariichthys* sp. (21 = 5.4 %), *Aequidens* sp. B (14 = 3.6 %), *Hoplias malabaricus* (12 = 3.1 %), *Brachyrhamdia marthae* (10 = 2.6 %), and *Aequidens* sp. A (8 = 2.1 %). Other species includes: *Astyanax abramis, Ctenobrycon spilurus, Moenkhausia dichroura, Hypoptopoma joberti, Characidium* sp., *Moenkhausia sanctaefilomenae*, and *Crenicichla heckeli*. The species community is typical for backwaters or lagoons.

Lower Nareuda/ Middle Tahuamanu Sub-Basin (Stations P01-11 to P01-21)

Field Station 96-P-01-11

Locality: Rio Nareuda 2 km above the mouth into Rio Tahuamanu. 11° 18' 18" S, 68° 45' 28" W 10/Sep/1996

Blackwater river (8-10 mts wide). The shore and bottom are muddy. Water current medium-fast. No aquatic plants. Gallery forest covering part of the margins. A total of 95 specimens were collected.

The species list includes:

Characiformes = 16

Siluriformes = 18

Gymnotiformes = 2

Perciformes = 2

Species total = 38

The most abundant species are: *Corydoras loretoensis* (11 = 11.6 %), *Aequidens paraguayensis* (9 = 9.5 %), and *Tyttocharax madeirae* (7 = 7.4%). Other species includes: *Astyanax abramis, Characidium* sp., *Pimelodella gracilis, Pimelodella* sp., *Moenkhausia sanctaefilomenae*, and *Tatia altae*. The community has a predominance of species typically from blackwater rivers.

Field Station 96-P-01-12

Locality: *Curichi* (flooded lake) on the right margin of the Rio Nareuda more or less 3-4 km from the mouth into the Rio Tahuamanu. Latitude and longitude unavailable.10/Sep/1996

Whitewater lagoon. The shore and bottom are muddy and with abundant submerged logs and leaves. Gallery forest covering part of the margins. A total of 420 specimens were collected.

The species list include:

Characiformes = 25

Siluriformes = 14

Perciformes = 4

Species total = 43

The most abundant species are: *Odontostilbe paraguayensis* (63 = 15 %), *Cyphocharax spiluropsis* (57 = 13.5 %), *Moenkhausia colletti* (45 = 10.7 %), *Phenacogaster* sp. B (41 = 9.8 %), and *Cheirodon fugitiva* (36 = 8.5 %). Other species includes: *Astyanax abramis, Aequidens* sp., *Brochis* sp., *Bunocephalus amazonicus, Cyphocharax* sp., *Ctenobrycon spilurus, Gasteropelecus sternicla, Moenkhausia sanctaefilomenae, Phenacogaster pectinatus, Parotocinclus* sp., *Rineloricaria lanceolata*, and *Sturisoma nigrirostrum*. The species are typically from *cochas* or flooded lakes.

Field Station 96-P-01-13

Locality: Rio Nareuda more or less 4 km from the mouth into the Rio Tahuamanu. 11° 18' 23" S, 68° 45' 57" W, 10/Sep/1996

Blackwater river (12 mts wide). The shore and bottom are muddy. Water current medium-fast. No aquatic plants. Gallery forest covering part of the margins. A total of 21 specimens were collected.

The species list includes:

Characiformes = 4

Siluriformes = 4

Perciformes = 1

Species total = 9

The most abundant species are: *Hoplias malabaricus* (5 = 23.8 %), *Astyanax abramis* (4 = 19 %), *Rineloricaria* sp. (4 = 19 %), and *Pimelodella gracilis* (3 = 14.3 %). Other species includes: *Aequidens paraguayensis, Imparfinis stictonotus, Moenkhausia* sp., *Prionobrama filigera*, and *Loricaria* sp.

Field Station 96-P-01-14

Locality: Rio Nareuda more or less 100 mts from the mouth into the Rio Tahuamanu. Latitude and longitude unavailable, 10/Sep/1996.

Blackwater river (12 mts wide). The shore and bottom are sandy. Water current medium-fast. No aquatic plants. Gallery forest covering part of the margins. A total of 63 specimens were collected.

The species list includes:

Characiformes = 15

Siluriformes = 11

Perciformes = 2

Rajiformes = 1

Species total = 29

The most abundant species are: *Phenacogaster* sp. (7 = 11 %), *Hypoptopoma joberti* (5 = 7.9 %), *Corydoras acutus* (5 = 7.9 %), and *Bunocephalus aleuropsis* (4 = 6.3 %). Other species includes: *Aequidens paraguayensis, Imparfinis stictonotus, Moenkhausia sanctaefilomenae, Moenkhausia* sp., *Prionobrama filigera, Pimelodella gracilis,* and *Potamotrygon motoro*. In general, these species are typically from blackwater rivers.

Field Station 96-P-01-15

Locality: Curichi (Flooded lake or dead arm), right margin of the Rio Nareuda more or less 5 km from the mouth into the Rio Tahuamanu. 11° 18' 32" S, 68° 45' 58" W, 11/Sep/1996.

Blackwater river lagoon. The shore and bottom are muddy with abundant logs and leaves. No aquatic plants. Gallery forest covering part of the margins. A total of 444 specimens were collected.

The species list includes:

Characiformes = 24

Siluriformes = 8

Perciformes = 2

Species total = 34

The most abundant species are: *Cyphocharax spiluropsis* (83 = 18.7 %), *Otocinclus mariae* (61 = 13.7 %), *Charax gibbosus* (46 = 10.3 %), *Ctenobrycon spilurus* (45 = 10.1%), and *Corydoras loretoensis* (43 = 9.7 %). Other species includes: *Aequidens tetramerus, Brachyrhamdia marthae, Bunocephalus amazonicus, Gasteropelecus sternicla, Hoplosternum thoracatus,*

Moenkhausia dichroura, Prochilodus nigricans, Steindachnerina dobula, Stethaprion crenatum, and *Triportheus angulatus*. This area has a high diversity.

Field Station 96-P-01-16

Locality: *Curichi* (flooded lake or dead arm), right margin of the Rio Nareuda more or less 5.5 km from the mouth into the Rio Tahuamanu. Latitude and longitude unavailable,11/Sep/1996.

It is a small area. The shore and bottom are muddy with lots of leaves and logs. No aquatic plants or gallery forest. A total of 5 specimens were collected.

The species list include:

Characiformes = 1

Siluriformes = 1

Species total = 2

The species are: *Hoplosternum thoracatus* (3 = 60 %) and *Hoplias malabaricus* (2 = 40 %).

Field Station 96-P-01-17

Locality: Rio Nareuda more or less 6 km from the mouth into the Rio Tahuamanu. 11° 18' 41" S, 68° 45' 50" W, 11/Sep/1996.

Blackwater river (15 m wide). The shore and bottom are muddy. Water current medium-fast. No aquatic plants. Gallery forest covering part of the margins. A total of 61 specimens were collected.

The species list includes:

Characiformes = 9

Siluriformes = 7

Perciformes = 2

Species total = 18

The most abundant species are: *Aequidens paraguayensis* (15 = 24.5 %), *Pimelodella gracilis* (9 = 14.7 %), *Moenkhausia* sp. (7 = 11.4 %), and *Rineloricaria* sp. (5 = 8.1 %). Other species includes: *Apistogramma linkei, Astyanax abramis, Corydoras loretoensis, Leporinus nattereri, Moenkhausia colletti, Ochmacanthus alternus, Prionobrama filigera*, and *Sturisoma nigrirostrum.*

Field Station 96-P-01-18

Locality: Rio Nareuda (rapids) more or less 6 km from the mouth into the Rio Tahuamanu. 11° 18' 18" S, 68° 45' 25" W, 11/Sep/1996.

Blackwater river (15 m wide). The shore and bottom are rocky. Water current fast. Algae on rocks. A total of 34 specimens were collected.

The species list includes:

Characiformes = 8

Siluriformes = 11

Species total = 19

The most abundant species are: *Peckoltia arenaria* (5 = 14.7 %), *Phenacogaster pectinatus* (4 = 11.7 %), *Corydoras loretoensis* (3 = 8.8 %), and *Ancistrus* sp. (2 = 5.8%). Other species includes: *Astyanax abramis, Imparfinis stictonotus, Knodus victoriae, Prionobrama filigera,* and *Tatia perugiae*. Species typically from rapids.

Field Station 96-P-01-19

Locality: Small creek on the right margin (Filadelfia?). 11° 20' 33" S, 68° 46' 54" W, 12/Sep/1996.

Blackwater river (5 mts wide). The shore and bottom are muddy with submerged logs. Water current medium. No aquatic plants. Gallery forest covering part of the margins. A total of 71 specimens were collected.

The species list includes:

Characiformes = 13

Siluriformes = 4

Gymnotiformes = 1

Perciformes = 1

Species total = 19

The most abundant species are: *Phenacogaster* sp. (18 = 25.3 %), *Moenkhausia sanctaefilomenae* (9 = 12.6 %), *Otocinclus mariae* (9 = 12.6 %), *Moenkhausia colletti* (6 = 8.4 %), *Cheirodon fugitiva* (6 = 8.4 %), and *Gasteropelecus sternicla* (6 = 8.4 %). Other species includes: *Apistogramma* sp., *Carnegiella myersi, Corydoras acutus, Ctenobrycon spilurus, Cynopotamus gouldingi, Hemiodontichthys acipenserinus, Phenacogaster pectinatus*, and *Sorubim lima*.

Field Station 96-P-01-20

Locality: Lagoon on the right margin of the Rio Tahuamanu more or less 500 mts from the mouth of the Rio Nareuda. 11° 18' 37" S, 68° 44' W, 12/Sep/1996.

Blackwater. The shore and bottom are muddy. Grasses and cyperaceans cover the margins. A total of 279 specimens were collected.

The species list includes:

Characiformes = 23

Siluriformes = 10

Perciformes = 4

Species total = 37

The most abundant species are: *Corydoras loretoensis* (63 = 22.5 %), *Cyphocharax spiluropsis* (45 = 16.1 %), *Ctenobrycon spilurus* (22 = 7.8%), *Hemigrammus ocellifer* (18 = 6.5 %), and *Knodus gamma* (15 = 5.3 %). Other species includes: *Aequidens* sp., *Astyanax abramis, Aphanotorulus* sp., *Carnegiella myersi*, *Mesonauta festivus, Moenkhausia dichroura, Ochmacanthus alternus, Odontostilbe hasemani, Pimelodella gracilis, Triportheus angulatus*, and *Steindachnerina dobula*. High diversity. Species common in lagoon-like habitats.

Field Station 96-P-01-21

Locality: Rio Nareuda, more or less 7 km above the mouth into the Rio Tahuamanu. 11° 18' 14" S, 68° 45' 45" W, 13/Sep/1996.

Blackwater river (15 mts wide). The shore and bottom are muddy. Water current medium-fast. No aquatic plants. Gallery forest covering part of the margins. A total of 147 specimens were collected.

The species list includes:

Characiformes = 17

Siluriformes = 13

Gymnotiformes = 3

Perciformes = 2

Species total = 35

The most abundant species are: *Hypoptopoma* sp. (27 = 18.4 %), *Abramites hypselonotus* (12 = 8.1 %), *Rineloricaria lanceolata* (9 = 6.1 %), *Eigenmannia trilineata* (8 = 5.4), *Hypoptopoma joberti* (8 = 5.4 %), and *Farlowella* sp. (8 = 5.4 %). Other species includes: *Aequidens paraguayensis, Apteronotus albifrons, Carnegiella myersi, Cochliodon cochliodon, Creagrutus* sp., *Hoplias malabaricus, Microglanis* sp., *Myleus* sp., *Phenacogaster pectinatus*, and *Prionobrama filigera* among others.

Manuripi/Lower Tahuamanu Sub-Basin (Stations P01-22 to P01-39)

Field Station 96-P-01-22

Locality: Lake S/N 12 km from Puerto Rico above Rio Manuripi. 11° 09' 14" S, 67° 33' 42" W, 15/Sep/1996.

Blackwater. The shore and bottom are muddy. Abundant aquatic plants (Eichhornia, Potamogyton, and cyperaceans). Gallery forest covering part of the margins. A total of 491 specimens were collected.

The species list includes:

Characiformes = 12

Siluriformes = 15

Gymnotiformes = 4

Perciformes = 3

Species total = 34

The most abundant species are: *Corydoras loretoensis* (206 = 42 %), *Apistogramma* sp. (48 = 9.7 %), *Brachyrhamdia marthae* (44 = 8.9 %), *Hemigrammus unilineatus* (42 = 8.5 %), and *Cyphocharax spiluropsis* (30 = 6.1 %). Other species includes: *Acanthodoras cataphractus, Amblydoras hancockii, Brachyhypopomus* sp., *Bunocephalus amazonicus, Cheirodon piaba, Gymnotus carapo, Hemigrammus ocellifer, Hypopygus lepturus, Moenkhausia comma, M. colletti, Pyrrhulina vittata, Rineloricaria lanceolata,* and *Pimelodella gracilis* among others. This is a very diverse station.

Field Station 96-P-01-23

Locality: Rio Manuripi 12 km above Puerto Rico.11° 09' 06" S, 67° 33' 41" W, 15/Sep/1996.

Blackwater river (70 mts wide). The shore and bottom are sandy. The water current medium-fast. Abundant cyperaceans and taropa?. A total of 834 specimens were collected.

The species list includes:

Characiformes = 22

Siluriformes = 26

Gymnotiformes = 6

Perciformes = 4

Synbranchiformes = 1

Atheriniformes = 1

Species total = 60

The most abundant species are: *Corydoras loretoensis* (104 = 12.4 %), *Pimelodella itapicu-ruensis* (75 = 9 %), *Apistogramma* sp. (75 = 9 %), *Pimelodella gracilis* (68 = 8.1 %), *Cypho-charax spiluropsis* (65 = 7.8 %), *Moenkhausia lepidura* (50 = 6 %), *Brachyhypopomus* sp. (48 = 5.8 %), *Parotocinclus* sp. (43 = 5.1 %), and *Amblydoras*

hancockii (40 = 4.8 %). Other species includes: *Anadoras grypus, Apistogramma* sp., *Astyanax abramis, Carnegiella myersi, Corydoras acutus, Hemigrammus ocellifer, Hypoptopoma joberti, Hypopygus lepturus, Mesonauta festivus, Moenkhausia dichroura, Nannostomus trifasciatus, Ochmacanthus alternus, Prionobrama filigera, Pyrrhulina vittata, Rivulus* sp., *Sternopygus macrurus*, and *Sturisoma nigrirostrum* among others. This is a very diverse station.

Field Station 96-P-01-24

Locality: Lake (S/N) camp site, 10 km above Puerto Rico. Rio Manuripi.11° 08' 13" S, 67° 33' 41" W, 15/Sep/1996.

Blackwater flooded lake. The shore and bottom are muddy/sandy. Abundant aquatic plants. A total of 465 specimens were collected.

The species list includes:

Characiformes = 9

Siluriformes = 10

Gymnotiformes = 1

Perciformes = 3

Synbranchiformes = 1

Species total = 24

The most abundant species are: *Apistogramma* sp. (234 = 50.3 %), *Hemigrammus lunatus* (72 = 15.5 %), *Amblydoras hancockii* (44 = 9.5 %), *Corydoras loretoensis* (44 = 9.5 %), and *Parotocinclus* sp. (15 = 3.2 %). Other species includes: *Astrodoras asterifrons, Brachyhypopomus* sp., *Brachyrhamdia marthae, Bunocephalus amazonicus, Cyphocharax spiluropsis, Moenkhausia colletti,* and *Synbranchus marmoratus* among others. This station possesses a high diversity of Siluriformes.

Field Station 96-P-01-25

Locality: Rio Manuripi 20 km above Puerto Rico. Latitude and longitude unavailable.16/Sep/1996

Blackwater river (50 mts wide). The shore and bottom are sandy. Water current medium-fast. Abundant aquatic plants (*Ponthederia, Eichhornia*) and cyperaceans. A total of 61 specimens were collected.

The species list includes:

Characiformes = 18

Siluriformes = 15

Gymnotiformes = 8

Perciformes = 3

Synbranchiformes = 1

Species total = 45

The most abundant species are: *Pimelodella gracilis* (68 = 14.3 %), *Moenkhausia lepidura* (65 = 13.7 %), *Corydoras loretoensis* (55 = 11.6 %), *Hypoptopoma joberti* (31 = 6.5 %), *Carnegiella myersi* (24 = 5.0 %), and *Rineloricaria* sp. (23 = 4.8 %). Other species includes: *Apistogramma* sp., *Apteronotus albifrons, Carnegiella strigata, Cochliodon cochliodon, Corydoras acutus, Ctenobrycon spilurus, Doras eigenmanni, Eigenmannia virescens, E. macrops, Entomocorus benjamini, Hemigrammus lunatus, Hypopygus lepturus, Laemolyta sp., Mesonauta festivus, Moenkhausia colletti, Nannostomus trifasciatus, Sternopygus macrurus,* and *Synbranchus marmoratus* among others. The high diversity of electric fishes is quite interesting. This station has a high overall diversity.

Field Station 96-P-01-26

Locality: Rio Manuripi 13 km above Puerto Rico.Latitude and longitude unavailable,16/Sep/1996.

Blackwater river (70 mts wide). The shore and bottom are sandy. Water current medium-fast. Abundant aquatic plants (Ponthederia, Eichhornia) and cyperaceans. A total of 555 specimens were collected.

The species list includes:

Characiformes = 12

Siluriformes = 21

Gymnotiformes = 5

Perciformes = 6

Synbranchiformes = 1

Species total = 45

The most abundant species are: *Pimelodella gracilis* (84 = 15.1 %), *Corydoras loretoensis* (77 = 13.8 %), *Hemigrammus* sp. (45 = 8.1 %), *Pimelodella itapicuruensis* (43 = 7.7 %), *Cyphocharax spilurus* (37 = 6.6 %), and *Apistogramma* sp. (32 = 5.8 %). Other species includes: *Auchenipterichthys thoracatus, Amblydoras hancockii, Brachyhypopomus* sp., *Corydoras acutus, Eigenmannia virescens, Gasteropelecus sternicla, Hoplias malabaricus, Hypoptopoma joberti, Nannostomus trifasciatus, Mesonauta festivus, Moenkhausia colletti, Ochmacanthus alternus, Prionobrama filigera, Rineloricaria lanceolata, Sturisoma nigrirostrum,* and *Sternopygus macrurus* among others. Station with high diversity, especially of Siluriformes and Gymnotiformes.

Field Station 96-P-01-27

Locality: Rio Manuripi 13 km above Puerto Rico.Latitude and longitude unavailable,16/Sep/1996.

Blackwater river (70 mts wide). The shore and bottom are sandy/muddy. Water current medium-fast. Abundant aquatic plants (*Ponthederia*, *Eichhornia*) and cyperaceans. A total of 577 specimens were collected.

The species list includes:

Characiformes = 13

Siluriformes = 15

Gymnotiformes = 8

Perciformes = 6

Synbranchiformes = 1

Species total = 43

The most abundant species are: *Cyphocharax spiluropsis* (73 = 12.6%), *Doras eigenmanni* (59 = 10.2 %), *Apistogramma* sp. (55 = 9.5 %), *Hemigrammus lunatus* (54 = 9.5 %), *Corydoras loretoensis* (41 = 7.1 %), and *Brachyhypopomus* sp. (31 = 5.3 %). Other species includes: *Adontosternarchus clarkae, Amblydoras hancockii, Cheirodon piaba, Corydoras acutus, Crenicara unctulata, Eigenmannia virescens, E. humboldtii, E. trilineata, Gasteropelecus sternicla, Hoplias malabaricus, Nannostomus trifasciatus, Mesonauta festivus, Moenkhausia lepidura, Ochmacanthus alternus, Trachelyopterus* cf. *galeatus, Pimelodella gracilis, Prionobrama filigera, Rineloricaria lanceolata, Sternopygus macrurus*, and *Synbranchus marmoratus* among others. Station with high diversity, especially of Siluriformes and Gymnotiformes.

Field Station 96-P-01-28

Locality: Lake (S/N) more or less 15 km above Puerto Rico. 11° 10' 29" S, 67° 33' 52" W, 17/Sep/1996.

Blackwater flooded lake. The shore and bottom are sandy/muddy. Abundant aquatic plants (Ponthederia, Eichhornia) and cyperaceans. A total of 357 specimens were collected.

The species list includes:

Characiformes = 8

Siluriformes = 10

Gymnotiformes =2

Perciformes = 2

Synbranchiformes = 1

Species total = 23

The most abundant species are: *Brachyrhamdia marthae* (137 = 38.4 %), *Hemigrammus lunatus* (97 = 27.1 %), *Apistogramma* sp. (33 = 9.2 %), and *Parotocinclus* sp. (33 = 9.2 %). Other species includes: *Acanthodoras cataphractus, Amblydoras hancockii, Brachyhypopomus pinnicaudatus, Corydoras napoensis, Eigenmannia trilineata, Hoplias malabaricus, Hypoptopoma joberti, Moenkhausia dichroura, Scoloplax dicra*, and *Synbranchus marmoratus* among others.

Field Station 96-P-01-29

Locality: Lake (S/N) more or less 15 km above Puerto Rico. 11° 09' 00" S, 67° 33' 37" W, 17/Sep/1996.

Blackwater flooded lake. The shore and bottom are sandy/muddy. Abundant aquatic plants (*Ponthederia, Eichhornia*) and cyperaceans. A total of 1014 specimens were collected.

The species list includes:

Characiformes = 11

Siluriformes = 11

Gymnotiformes = 1

Perciformes = 5

Species total = 28

The most abundant species are: *Corydoras loretoensis* (479 = 47.2 %), *Brachyrhamdia marthae* (105 = 10.3 %), *Apistogramma* sp. (80 = 7.8 %), *Moenkhausia colletti* (63 = 6.2 %), *Cyphocharax* sp. (43 = 4.2 %), and *Cheirodon piaba* (36 = 3.5 %). Other species includes: *Amblydoras hancockii, Corydoras acutus, Crenicara unctulata, Eigenmannia trilineata, Hemigrammus unilineatus, H. ocellifer, Hoplias malabaricus, Hyphessobrycon anisitsi, Nannostomus trifasciatus, Otocinclus mariae, Pimelodella boliviana,* and *Rineloricaria lanceolata.*

Field Station 96-P-01-30

Locality: Lake (S/N) more or less 12 km above Puerto Rico. Latitude and longitude unavailable,17/Sep/1996.

Blackwater flooded lake. The shore and bottom are sandy/muddy. Abundant aquatic plants (*Ponthederia, Eichhornia*) and cyperaceans. A total of 921 specimens were collected.

The species list includes:

Characiformes = 24

Siluriformes = 13

Perciformes =8

Species total = 45

The most abundant species are: *Corydoras loretoensis (216 = 23.4 %),* Cyphocharax spiluropsis (182 = 19.8 %), *Apistogramma* sp. (151 = 16.4 %), *Parotocinclus* sp. (61 = 6.6 %), *Ctenobrycon spilurus* (40 = 4.3 %), and *Poptella compressa* (27 = 2.9 %). Other species includes: *Aequidens* sp., *Amblydoras hancockii, Brochis splendens, Corydoras acutus, Curimatella dorsalis, Cichlasoma severum, Hoplias malabaricus, Leporinus nattereri, Mesonauta festivus, Moenkhausia colletti, M. dichroura, Ochmacanthus alternus, Pimelodella gracilis, Pygocentrus nattereri, Satanoperca acuticeps*, and *Serrasalmus hollandi* among others. Station with high diversity, especially of Characiformes.

Field Station 96-P-01-31

Locality: Rio Orthon more or less 2 km below Puerto Rico.11° 05' 23" S, 67° 33' 29" W, 18/Sep/1996

Whitewater river (80 mts wide). The shore and bottom are sandy/muddy. Water current medium-fast. Patches of aquatic plants (*Ponthederia, Eichhornia*) and cyperaceans. A total of 332 specimens were collected.

The species list includes:

Characiformes = 23

Siluriformes = 30

Gymnotiformes = 4

Perciformes = 5

Species total = 62

The most abundant species are: *Prionobrama filigera* (128 = 38.5 %), *Corydoras loretoensis* (38 = 11.4 %), *Engraulisoma taeniatum* (31 = 9.3 %), *Paragoniates alburnus* (20 = 6.0 %), and *Moenkhausia dichroura* (15 = 4.5 %). Other species includes: *Auchenipterichthys thoracatus, Aphyocharax dentatus, Brachyhypopomus* sp., *Brochis splendens, Corydoras acutus, C. aeneus, Crenicichla heckeli, Eigenmannia virescens, E. macrops, E. trilineata, Eucynopotamus biserialis, Hypoptopoma joberti, Knodus heterestes, Megalonema* sp. nov. (?), *Moenkhausia chrysargyrea, M. lepidura, Pachyurus sp., Ochmacanthus alternus, Pimelodella serrata, P. gracilis, Pimelodus blochii, Thoracocharax stellatus*, and *Tympanopleura* sp. among others. Station with very high diversity, especially of Siluriformes and Characiformes. A possible new species of *Megalonema*.

Field Station 96-P-01-32

Locality: Rio Tahuamanu, 500 mts above the conjunction with Rio Manuripi. Latitude and longitude unavailable, 18/Sep/1996.

Whitewater river (60 mts wide). The shore and bottom are sandy, with lots of logs. Water current medium-fast. A total of 40 specimens were collected.

The species list includes:

Characiformes = 8

Siluriformes = 7

Perciformes = 1

Species total = 16

The most abundant species are: *Prionobrama filigera* (11 = 27.5 %), *Eucynopotamus biserialis* (6 = 15 %), *Imparfinis stictonotus* (3 = 7.5 %), and *Paragoniates alburnus* (3 = 7.5 %). Other species includes: *Aphanotorulus frankei, Aphyocharax dentatus, Astyanax abramis, Crossoloricaria* sp., *Galeocharax gulo, Moenkhausia lepidura, Pseudostegophilus nemurus,* and *Vandellia cirrhosa* among others.

Field Station 96-P-01-33

Locality: Lake La Anguila on Rio Manuripi, more or less 1 km from the union of the Rio Tahuamanu and Rio Manuripi. 11° 06' 40" S, 67° 33' 20" W, 18/Sep/1996.

Blackwater flooded lake. The shore and bottom are sandy/muddy. Abundance of semiaquatic plants grasses and cyperaceans. A total of 631 specimens were collected.

The species list includes:

Characiformes = 13

Siluriformes = 13

Perciformes = 5

Species total = 31

The most abundant species are: *Corydoras loretoensis* (212 = 33.6 %), *Poptella compressa* (127 = 20.1 %), *Moenkhausia colletti* (53 = 8.4 %), *Ctenobrycon spilurus* (40 = 6.3 %), and *Moenkhausia dichroura* (39 = 6.1 %). Other species includes: *Amblydoras hancockii, Ancistrus*

sp., *Apistogramma* sp., *Carnegiella myersi, Corydoras acutus, Cyphocharax spiluropsis, Dianema longibarbis, Gasteropelecus sternicla,* and *Hemigrammus unilineatus* among others. This area has several species important in the aquarium trade.

Field Station 96-P-01-34

Locality: Rio Manuripi, beach on the right margin 5 km from the union with the Rio Tahuamanu. 11° 07' 38" S, 67° 33' 29" W, 18/Sep/1996

Blackwater river (100 mts wide). The shore and bottom are muddy. Water current slow. Patches of aquatic vegetation (*Ponthederia, Eichhornia*), grasses, and cyperaceans on the margins. A total of 639 specimens were collected.

The species list includes:

Characiformes = 17

Siluriformes = 28

Gymnotiformes = 5

Perciformes = 3

Species total = 53

The most abundant species are: *Eigenmannia macrops* (222 = 34.7 %), *Doras* cf. *carinatus* (59 = 9.2 %), *Creagrutus* sp. (46 = 7.1 %), *Moenkhausia colletti* (39 = 6.1 %), *Corydoras loretoensis* (38 = 5.9 %), and *Apistogramma* sp. (26 = 4.1 %). Other species includes: *Auchenipterichthys thoracatus, Amblydoras hancockii, Brochis splendens, Corydoras acutus, Eigenmannia virescens, E. humboldtii, Entomocorus benjamini, Gasteropelecus sternicla, Hemidoras microstomus Hoplias malabaricus, Megalonema* sp. nov., *Mesonauta festivus, Moenkhausia megalops, Ochmacanthus alternus, Opsodoras humeralis, Pimelodella gracilis, Prionobrama filigera, Rineloricaria lanceolata, Serrasalmus hollandi,* and *Trachydoras paraguayensis* among others. Station with high diversity, especially of Siluriformes and Characiformes. High density of electric fishes. Several species very important in the aquarium trade.

Field Station 96-P-01-35

Locality: Rio Manuripi, arm at 1 km above base camp. 11° 08' 32" S, 67° 33' 33" W, 18/Sep/1996.

Blackwater river (30-40 mts wide). The shore and bottom are sandy/muddy. Water current medium-fast. Abundant aquatic plants (*Ponthederia, Eichhornia*), grasses, and cyperaceans on the margins. A total of 335 specimens were collected.

The species list includes:

Characiformes = 20

Siluriformes = 13

Gymnotiformes = 2

Perciformes = 2

Species total = 37

The most abundant species are: *Cyphocharax spiluropsis* (51 = 15.2 %), *Pimelodella gracilis* (51 = 15.2 %), *Corydoras loretoensis* (37 = 11.0 %), *Pimelodella itapicuruensis* (28 = 8.3 %), *Eigenmannia macrops* (25 = 7.4 %), and *Ctenobrycon spilurus* (18 = 5.3 %). Other species includes: *Apistogramma* sp., *Corydoras acutus, Curimatella dorsalis, Eigenmannia virescens, Hemiodontichthys acipenserinus, Hypoptopoma joberti, Nannostomus trifasciatus, Moenkhausia colletti, M. lepidura, Ochmacanthus alternus, Phenacogaster microstictus, P. pectinatus, Pimelodella cristata, Prionobrama filigera, Rineloricaria* sp., and *Triportheus angulatus* among others. Station with medium diversity, especially of Characiformes and Siluriformes. Several species very important in the aquarium trade.

Field Station 96-P-01-36

Locality: Lake La Anguila on Rio Manuripi, more or less 1 km from the union of the Rio Tahuamanu and Rio Manuripi (same as P1-33). 11° 06' 40" S, 67° 33' 20" W, 19/Sep/1996.

Blackwater flooded lake. The shore and bottom are sandy/muddy. Abundant semiaquatic plants, grasses, and cyperaceans. A total of 127 specimens were collected.

The species list includes:

Characiformes = 10

Siluriformes = 6

Perciformes = 2

Species total = 18

The most abundant species are: *Psectrogaster curviventris* (23 = 18.1 %), *Potamorhina laitior* (22 = 17.3 %), *Hemigrammus lunatus* (22 = 17.3 %), *Poptella compressa* (21 = 16.5 %), and *Glyptoperichthys lituratus* (6 = 4.7 %). Other species includes: *Cichla monoculus, Cyphocharax spiluropsis, Liposarcus disjunctivus, Platydoras*

costatus, Potamorhina altamazonica, Pseudoplatystoma fasciatum, Serrasalmus hollandi, and *Triportheus angulatus* among others. Station with medium diversity. Some species of commercial importance in aquarium trade. (Atarraya).

Field Station 96-P-01-37

Locality: Lake (S/N) on Rio Manuripi, 9 km from Puerto Rico.11° 07' 59" S, 67° 33' 28" W, 20/Sep/1996.

Blackwater flooded lake. The shore and bottom are sandy/muddy. Riparian forest on margins. A total of 893 specimens were collected.

The species list includes:

Characiformes = 20

Siluriformes = 13

Perciformes = 6

Species total = 39

The most abundant species are: *Poptella compressa* (200 = 22.4 %), *Moenkhausia colletti* (181 = 20.2 %), *Apistogramma* sp. (96 = 10.8 %), *Corydoras loretoensis* (76 = 8.5 %), and *Cyphocharax spiluropsis* (45 = 5.0 %). Other species includes: *Auchenipterus thoracatus, Agamyxis pectinifrons, Amblydoras hancockii, Brachyrhamdia marthae, Corydoras acutus, Ctenobrycon spilurus, Gasteropelecus sternicla, Hemigrammus unilineatus, Moenkhausia chrysargyrea, Trachelyopterus* cf. *galeatus, Satanoperca acuticeps*, and *Tatia aulopigia* among others. Medium/high diversity. Several abundant species of commercial importance in aquarium trade.

Field Station 96-P-01-38

Locality: Rio Manuripi, 8 km above Puerto Rico.11° 07' 32" S, 67° 33' 25" W, 20/Sep/1996.

Blackwater river. The shore and bottom are sandy. Some aquatic and semiaquatic plants (Eichhornia and Ponthederia), grasses, and cyperaceans. A total of 153 specimens were collected.

The species list includes:

Characiformes = 7

Siluriformes = 13

Gymnotiformes = 2

Perciformes = 3

Species total = 25

The most abundant species are: *Corydoras loretoensis* (51 = 33.3 %), *Parotocinclus* sp. (24 = 15.7 %), *Knodus caquetae* (9 = 5.8 %), %), and *Apistogramma* sp. (7 = 4.6 %). Other species includes: *Apteronotus albifrons, Brachyrhamdia marthae, Corydoras acutus, Crenicichla heckeli, Ctenobrycon spilurus, Eigenmannia virescens, Moenkhausia colletti, Pimelodella cristata, and Rineloricaria* sp. among others. Medium diversity. Several species of commercial importance in aquarium trade.

Field Station 96-P-01-39

Locality: Lake La Anguila on Rio Manuripi, more or less 1 km from the union of the Rio Tahuamanu and Rio Manuripi (same as P1-33). 11° 06' 40" S, 67° 33' 20" W, 20/Sep/1996.

Blackwater flooded lake. The shore and bottom are sandy/muddy. Abundant semiaquatic plants, grasses, and cyperaceans. A total of 64 specimens were collected.

The species list includes:

Characiformes = 7

Siluriformes = 1

Species total = 8

The most abundant species are: *Psectrogaster curviventris* (32 = 50 %), *Potamorhina laitior* (12 = 18.8 %), and *Engraulisoma taeniatum* (9 = 14 %). Other species includes: *Metynnis luna, Poptella compressa*, and *Triportheus angulatus* among others. Station with low diversity. Some species of commercial importance for human consumption. Collected with Tarrafa (Atarraya).

Group P2

Upper Nareuda Sub-Basin (Stations P02-01 to P02-13)

Field Station 96-P-02-01

Locality: Rio Nareuda, above camp Nareuda (at beach). 11° 16' S, 69° 04' W, 4/Sep/1996.

White turbid water river. The shore and bottom are sandy/muddy. No semiaquatic or aquatic plants. Water current moderate. A total of 80 specimens were collected.

The species list includes:

Characiformes = 6

Siluriformes = 13

Perciformes = 2

Species total = 21

The most abundant species are: *Knodus gamma* (24 = 30 %), *Pimelodella gracilis* (19 = 23.7 %), and *Hyphessobrycon gracilior* (8 = 10 %). Other species includes: *Aequidens paraguayensis, Brachychalcinus copei, Bunocephalus amazonicus, Corydoras acutus, Crenicichla heckeli, Homodiaetus* sp., *Pseudocetopsis* sp., *Rineloricaria lanceolata*, and *Vandellia cirrhosa* among others. Station with medium diversity.

Field Station 96-P-02-02

Locality: Rio Nareuda at camp.11° 16' S, 69° 04' W, 4/Sep/1996.

White turbid water river (8 mts wide). The shore and bottom are sandy/muddy with some submerged rocks and logs. No aquatic plants. Gallery forest. A total of 425 specimens were collected.

The species list includes:

Characiformes = 22

Siluriformes = 9

Perciformes = 2

Species total = 33

The most abundant species are: *Odontostilbe hasemani* (225 = 53 %), *Aphyocharax dentatus* (37 = 8.7 %), *Phenacogaster* sp. (27 = 6.3 %), *Bryconamericus* sp. (24 = 5.6 %), *Knodus gamma* (17 = 4 %), and *Creagrutus* sp. (14 = 3.2 %). Other species includes: *Aequidens paraguayensis, Aphanotorulus frankei, Aphyocharax alburnus, Brachychalcinus copei, Characidium* sp., *Gasteropelecus sternicla, Megalonema* sp., *Moenkhausia sanctaefilomenae, Otocinclus mariae, Pimelodella gracilis, Prionobrama filigera*, and *Steindachnerina dobula* among others. Station with medium diversity. Some species of importance in aquarium trade.

Field Station 96-P-02-03

Locality: Rio Nareuda, below bridge covered about 300 yards.11° 16' 39" S, 69° 03' 57" W, 4/ Sep/1996.

White turbid water river (8 mts wide). The shore and bottom are sandy/muddy with some submerged rocks and logs. No aquatic plants. Gallery forest. A total of 52 specimens were collected.

The species list includes:

Characiformes = 8

Siluriformes = 13

Perciformes = 2

Beloniformes = 1

Species total = 24

The most abundant species are: *Hypoptopoma* sp. (7 = 13.4 %), *Rineloricaria lanceolata* (5 = 9.6 %), *Sturisoma nigrirostrum* (4 = 7.6 %), *Moenkhausia sanctaefilomenae* (4 = 7.6 %), and *Moenkhausia* sp. (4 = 7.6 %). Other species includes: *Aequidens* sp., *Ancistrus* sp., *Apistogramma* sp., *Characidium* sp., *Cochliodon cochliodon, Corydoras acutus, Farlowella* sp., *Pimelodella gracilis, Pseudocetopsis* sp., *Potamorrhaphis* sp., *Sturisoma nigrirostrum, Tatia altae*, and *Tyttocharax madeirae* among others. Station with low diversity. Some species of commercial value.

Field Station 96-P-02-04

Locality: Rio Nareuda just above camp.Latitude and longitude unavailable.4/Sep/1996.

White turbid water river (8 mts wide). The shore and bottom are sandy/muddy with some rocks and logs submerged. No aquatic plants. Gallery forest. A total of 38 specimens were collected.

The species list includes:

Characiformes = 10

Siluriformes = 6

Species total = 16

The most abundant species are: *Mylossoma duriventre* (9 = 23.7 %), *Hydrolycus pectoralis* (5 = 13.1 %), *Cochliodon cochliodon* (3 = 7.9 %), *Prochilodus nigricans* (3 = 7.9 %), and *Rhaphiodon vulpinus* (2 = 5.2 %). Other species includes: *Ageneiosus* sp., *Hemisorubim platyrhynchus, Leporinus friderici, Pimelodella cristata, Pimelodus armatus, Schizodon fasciatus, Serrasalmus rhombeus,* and *Triportheus angulatus* among others. Collected with gillnets.

Field Station 96-P-02-05

Locality: Rio Nareuda 1 hour above camp, by ca(o coming from the forest. Latitude and longitude unavailable, 5/Sep/1996.

White turbid water small river. The shore and bottom are sandy/muddy with some rocks and logs submerged. No aquatic plants. Gallery forest. A total of 119 specimens were collected.

The species list includes:

Characiformes = 14

Siluriformes = 11

Gymnotiformes = 1

Perciformes = 4

Synbranchiformes = 1

Species total = 18

The most abundant species are: *Knodus gamma* (21 = 17.6 %), *Phenacogaster pectinatus* (18 = 15.1 %), *Bryconamericus* cf. *peruanus* (17 = 14.3 %), *Aphanotorulus frankei* (14 = 11.7 %), and *Aequidens paraguayensis* (5 = 4.2 %). Other species includes: *Apistogramma* spp., *Bunocephalus depressus, Carnegiella myersi, Corydoras acutus, Gasteropelecus sternicla, Gymnotus coatesi, Homodiaetus* sp., *Imparfinis stictonotus, Otocinclus mariae, Steindachnerina dobula,* and *Synbranchus marmoratus* among others. Station with low diversity.

Field Station 96-P-02-06

Locality: Rio Nareuda by ca(o coming from the forest. Latitude and longitude unavailable, 5/Sep/1996.

White turbid water small river. The shore and bottom are sandy/muddy with some gravel and submerged leaves. No aquatic plants. Gallery forest. A total of 71 specimens were collected.

The species list includes:

Characiformes = 4

Siluriformes = 9

Gymnotiformes = 1

Perciformes = 1

Species total = 15

The most abundant species are: *Characidium* sp. (17 = 23.9 %), *Otocinclus mariae* (16 = 22.5 %), *Bryconamericus* cf. *peruanus* (10 = 14.1 %), and *Microglanis* sp. (5 = 7 %). Other species includes: *Ancistrus* sp., *Apistogramma* sp., *Cochliodon cochliodon, Chrysobrycon* sp., *Moenkhausia sanctaefilomenae*, and *Phenacogaster pectinatus* among others. Station with low diversity, however was an interesting locality because many species collected here, such as *Microglanis,* were not collected in the Nareuda proper.

Field Station 96-P-02-07

Locality: Rio Nareuda 1 km just below ca(o coming from the forest. Latitude and longitude unavailable, 5/Sep/1996.

White turbid water small river. The shore and bottom are sandy/muddy with some gravel and submerged leaves. No aquatic plants. Gallery forest. A total of 43 specimens were collected.

The species list includes:

Characiformes = 9

Siluriformes = 10

Gymnotiformes = 1

Perciformes = 2

Synbranchiformes = 1

Species total = 23

The most abundant species are: *Pimelodella gracilis* (6 = 13.9 %), *Creagrutus* sp. (5 = 11.6 %), *Hypoptopoma* sp. (4 = 9.3 %), and *Hypostomus* sp. (4 = 9.3 %). Other species includes: *Aequidens paraguayensis, Bunocephalus* sp., *Cochliodon cochliodon, Corydoras acutus, Galeocharax gulo, Gymnotus anguillaris, Steindachnerina dobula*, and *Synbranchus marmoratus*.

Field Station 96-P-02-08

Locality: Rio Nareuda at beach 200 mts below the bridge. 11° 16' 39" S, 69° 03' 57" W, 5/Sep/1996.

White turbid water small river. The shore and bottom are sandy/muddy with some gravel and submerged leaves. No aquatic plants. Gallery forest. A total of 57 specimens were collected.

The species list includes:

Characiformes = 8

Siluriformes = 9

Perciformes = 2

Species total = 19

The most abundant species are: *Knodus gamma* (14 = 24.6 %), *Pimelodella gracilis* (7 = 12.3 %), *Knodus* sp. (6 = 10.5 %), and *Aequidens*

paraguayensis (5 = 8.8 %). Other species includes: *Ancistrus* sp., *Corydoras acutus, Crenicichla heckeli, Imparfinis stictonotus, Moenkhausia colletti, Phenacogaster* sp., and *Tyttocharax madeirae* among others. Station with low diversity.

Field Station 96-P-02-09

Locality: Rio Tahuamanu, small river at bridge on road to Cobija. 11° 14' 29" S, 68° 59' 33" W, 7/ Sep/1996.

Small black, but turbid, water igarape (less than 3 mts wide). The shore and bottom are sandy/ muddy with some submerged leaves and logs. Some aquatic plants. Gallery forest. A total of 157 specimens were collected.

The species list includes:

Characiformes = 14

Siluriformes = 5

Gymnotiformes = 1

Species total = 20

The most abundant species are: *Moenkhausia colletti* (42 = 26.7 %), *Bryconamericus peruanus* (32 = 20.3 %), *Phenacogaster pectinatus* (16 = 10.2 %), and *Tyttocharax tambopatensis* (15 = 9.6 %). Other species includes: *Brachychalcinus copei, Corydoras trilineatus, Eigenmannia virescens, Farlowella* sp., *Pyrrhulina vittata, Rineloricaria lanceolata*, and *Steindachnerina guentheri.*

Field Station 96-P-02-10

Locality: Rio Nareuda 1 hour above camp, by ca(o coming from the forest. 11° 16' 33" S, 69° 04' 30" W, 7/Sep/1996.

White turbid water small river (1.5 mts). The shore and bottom are sandy/muddy with some submerged sticks and leaves. No aquatic plants. Gallery forest. A total of 34 specimens were collected.

The species list includes:

Characiformes = 6

Siluriformes = 3

Perciformes = 3

Species total = 12

The most abundant species are: *Pimelodella gracilis* (8 = 23.5 %), *Carnegiella myersi* (6 = 17.6 %), *Phenacogaster pectinatus* (5 = 14.7 %), and *Moenkhausia sanctaefilomenae* (4 = 11.7%). Other species includes: *Aequidens paraguayensis, Apistogramma linkei, Corydoras loretoensis, C. acutus, Crenicichla heckeli, Cynopotamus gouldingi,* and *Moenkhausia colletti* among others. Low diversity.

Field Station 96-P-02-11

Locality: Rio Nareuda, ca(o coming from the forest. 11° 16' 33" S, 69° 04' 31" W, 7/Sep/1996.

White turbid water small river (2 mts). The shore and bottom are sandy/muddy with some gravel and submerged leaves. No aquatic plants. Gallery forest. A total of 25 specimens were collected.

The species list includes:

Characiformes = 7

Siluriformes = 3

Gymnotiformes = 1

Perciformes = 1

Species total = 12

The most abundant species are: Eigenmannia macrops (10 = 23.9 %), Moenkhausia colletti (2 = 22.5 %), *Phenacogaster pectinatus* (2 = 14.1 %), and *Tyttocharax* sp. nov. (2 = 7 %). Other species includes: *Ancistrus* sp., *Apistogramma* sp., *Cochliodon cochliodon, Chrysobrycon sp., Moenkhausia sanctaefilomenae,* and *Phenacogaster pectinatus* among others. Station with low diversity, however was an interesting locality because many species collected here, such as *Microglanis*, were not collected in the Nareuda proper.

Field Station 96-P-02-12

Locality: Rio Nareuda by caño coming from the forest. 11° 17' 27" S, 69° 04' 41" W, 8/Sep/1996.

White turbid water small river. The shore and bottom are sandy/muddy with some submerged logs and leaves. Some aquatic plants. Gallery forest. A total of 15 specimens were collected.

The species list includes:

Characiformes = 4

Siluriformes = 3

Perciformes = 1

Species total = 8

The most abundant species are: *Chrysobrycon* sp. (4 = 26.6 %), *Moenkhausia colletti* (3 = 20

%), *Bunocephalus amazonicus* (2 =13.3 %), and *Tyttocharax madeirae* (2 = 13.3 %). Other species includes: *Aphyocharax dentatus, Crenicichla* sp., *Imparfinis stictonotus*, and *Tyttocharax tambopatensis* among others. Station with very low diversity.

Field Station 96-P-02-13

Locality: Garape Campo Franza. 11° 17' 06" S, 69° 04' 24" W, 8/Sep/1996.

White turbid water small river. The shore and bottom are sandy/muddy, with some submerged logs and leaves. No aquatic plants. Gallery forest disturbed by cattle ranching. A total of 93 specimens were collected.

The species list includes:

Characiformes = 15

Siluriformes = 8

Gymnotiformes = 1

Perciformes = 2

Species total = 26

The most abundant species are: *Tyttocharax tambopatensis* (18 = 19.4 %), *Moenkhausia colletti* (17 = 18.3 %), *Pyrrhulina vittata* (7 = 7.5 %), *Gasteropelecus sternicla* (7 = 7.5 %) and *Apistogramma* sp. (5 = 5.3 %). Other species includes: *Ancistrus* sp., *Apistogramma* sp., *Cochliodon cochliodon, Chrysobrycon* sp., *Moenkhausia sanctaefilomenae*, and *Phenacogaster pectinatus* among others. Station with low diversity, however was an interesting locality because many species collected here, such as *Microglanis*, were not collected in the Nareuda proper.

Middle Tahuamanu Sub-Basin (Stations P02-14 to P02-27)

Field Station 96-P-02-14

Locality: Rio Tahuamanu, 15 min. from the mouth of the Rio Nareuda. 11° 17' 39" S, 68° 44' 23" W, 10/Sep/1996.

White turbid water river (100 mts wide). The shore and bottom are sandy/muddy. No aquatic plants. Gallery forest. A total of 100 specimens were collected.

The species list includes:

Characiformes = 12

Siluriformes = 7

Perciformes = 1

Species total = 20

The most abundant species are: *Crenicichla heckeli* (29 = 29 %), *Pimelodella itapicuruensis* (16 = 16 %), *Prionobrama filigera* (13 = 13 %), *Acanthopoma bondi* (8 = 8%), and *Aphyocharax dentatus* (6 = 6 %). Other species includes: *Aphanotorulus frankei, Astyanax abramis, Centromochlus heckeli, Farlowella* sp., *Moenkhausia dichroura, Pimelodella hasemani*, and *Thoracocharax stellatus* among others. Station with low diversity.

Field Station 96-P-02-15

Locality: Rio Tahuamanu at sand island across lake, 1.93 km below Rio Nareuda mouth (same as P02-27). 11° 17' 33" S, 68° 44' 28" W, 10/Sep/1996.

White turbid water river (100 mts. wide). The shore and bottom are sandy/muddy. No aquatic plants. A total of 40 specimens were collected.

The species list includes:

Characiformes = 7

Siluriformes = 5

Perciformes = 1

Species total = 13

The most abundant species are: *Apistogramma* sp. (12 = 30 %), *Pimelodella gracilis* (5 = 12.5 %), *Moenkhausia* sp. (4 = 10 %), and *Crossoloricaria* sp. (4 = 10 %). Other species includes: *Aphyocharax dentatus, Clupeacharax anchoveoides, Engraulisoma taeniatum, Galeocharax gulo, Peckoltia arenaria,* and *Steindachnerina* sp. among others. Station with low diversity.

Field Station 96-P-02-16

Locality: Rio Tahuamanu below camp, 0.99 km below Rio Nareuda mouth. 11° 16' 24" S, 68° 44' 13" W, 10/Sep/1996.

White turbid water river (100 mts wide). The shore and bottom are sandy/muddy with some submerged logs and leaves. No aquatic plants. A total of 211 specimens were collected.

The species list includes:

Characiformes = 17

Siluriformes = 10

Perciformes = 1

Clupeiformes = 1

Species total = 29

The most abundant species are: *Odontostilbe hasemani* (53 = 25.1 %), *Aphanotorulus frankei* (49 = 23.2 %), *Knodus* sp. (23 = 10.9 %), *Pimelodella itapicuruensis* (13 = 6.1 %), and *Anchoviella carrikeri* (11 = 5.2 %). Other species includes: *Abramites hypselonotus, Acanthopoma bondi, Creagrutus* sp., *Moenkhausia dichroura, Paragoniates alburnus*, and *Prionobrama filigera* among others. Station with medium diversity, however was a good collection of *Aphanotorulus* and *Anchoviella.*

Field Station 96-P-02-17

Locality: Rio Tahuamanu, below camp along sandy beaches.11° 16' 22" S, 68° 44' 16" W, 10/ Sep/1996

White turbid water river (100 mts wide). The shore and bottom are sandy/muddy. No aquatic plants. A total of 77 specimens were collected.

The species list includes:

Characiformes = 3

Siluriformes = 8

Species total = 11

The most abundant species are: *Megalonema* sp. nov. (35 = 45.4 %), *Creagrutus* sp. (24 = 31.2 %), and *Pimelodus* sp. (11 = 5.2 %). Other species includes: *Cetopsorhamdia phantasia, Engraulisoma taeniatum, Phenacogaster* sp., *Planiloricaria cryptodon, Pseudohemiodon* sp., and *Vandellia cirrhosa* among others. Station with low diversity, however was a good collection of a new species of *Megalonema*.

Field Station 96-P-02-18

Locality: Garape Preto, ca 300 m above mouth into Rio Tahuamanu, 4.36 km below mouth of Rio Nareuda.Latitude and longitude unavailable, 11/Sep/1996.

Blackwater small river (5-6 mts wide). The shore and bottom are sandy/muddy with some submerged logs and leaves. No aquatic plants. Dense gallery forest A total of 84 specimens were collected.

The species list includes:

Characiformes = 10

Siluriformes = 7

Gymnotiformes = 1

Perciformes = 2

Beloniformes = 1

Species total = 21

The most abundant species are: *Moenkhausia colletti* (30 = 35.7 %), *Apistogramma* sp. (10 = 11.9 %), *Moenkhausia sanctaefilomenae* (9 = 10.7 %), and *Otocinclus mariae* (7 = 8.3 %). Other species includes: *Aequidens paraguayensis, Carnegiella myersi, Cochliodon cochliodon, Cyphocharax spiluropsis, Corydoras loretoensis, Moenkhausia lepidura, Potamorrhaphis* sp., *Pyrrhulina vittata*, and *Tyttocharax madeirae* among others. Station with medium diversity.

Field Station 96-P-02-19

Locality: Garape Preto, above mouth at Chachalita (?) in Rio Tahuamanu, 4.36 km below mouth of Rio Nareuda. 11° 16' 21" S, 68° 44' 15" W, 11/Sep/1996.

Blackwater water river (4 mts wide). The shore highly disturbed. Shore and bottom are sandy/ muddy with some submerged logs and leaves. Some rooted aquatic plants and grasses. A total of 74 specimens were collected.

The species list includes:

Characiformes = 9

Siluriformes = 6

Perciformes = 1

Species total = 16

The most abundant species are: *Moenkhausia colletti* (24 = 32.4 %), *Ochmacanthus alternus* (9 = 12.1 %), *Moenkhausia sanctaefilomenae* (6 = 8.1 %), and *Otocinclus mariae* (5 = 6.8 %). Other species includes: *Apistogramma* sp., *Characidium* sp., *Cochliodon cochliodon, Farlowella oxyrryncha, Microschemobrycon geisleri*(*), *Phenacogaster* sp., and *Pimelodella gracilis* among others. Station with low diversity, however was first station with *Microschemobrycon*.

Field Station 96-P-02-20

Locality: Rio Tahuamanu at large sandy spit and beach across river on muddy shore below Cachmelita (?). 11° 16' 11" S, 68° 43' 55" W, 11/ Sep/1996.

White turbid water river (100 mts wide). The shore and bottom are sandy/muddy. No aquatic plants. A total of 23 specimens were collected.

The species list includes:

Characiformes = 1

Siluriformes = 2

Species total = 3

The most abundant species are: *Aphanotorulus frankei* (15 = 65.2 %), *Steindachnerina* sp. (7 = 30.4 %), and *Pimelodus blochii* (1 = 4.3 %). Station with only 3 species collected.

Field Station 96-P-02-21

Locality: Rio Tahuamanu below mouth of Nareuda. 11° 16' 22" S, 68° 44' 16" W, 11/Sep/1996.

White turbid water river (100 mts wide). The shore and bottom are sandy/muddy with some submerged logs and leaves. No aquatic plants. A total of 21 specimens were collected.

The species list includes:

Characiformes = 2

Siluriformes = 5

Species total = 7

The most abundant species are: *Megalonema* sp. nov. (9 = 42.8 %) and *Creagrutus* sp. (7 = 33.3 %). Other species includes: *Odontostilbe eques, Cochliodon cochliodon, Cheirodon fugitiva, Pimelodella gracilis,* and *Pimelodella itapicuruensis*. Station with very low diversity, however we collected several specimens of the new species of *Megalonema*.

Field Station 96-P-02-22

Locality: Rio Tahuamanu at rocky island archipelago and rapids, 6.8 km below mouth of Rio Nareuda.11° 18' 09" S, 68° 44' 28" W, 12/Sep/1996.

White turbid water river (100 mts wide). The shore and bottom are rocky, sandy/muddy with some logs. No aquatic plants. A total of 185 specimens were collected.

The species list includes:

Characiformes = 18

Siluriformes = 12

Gymnotiformes = 1

Species total = 31

The most abundant species are: *Odontostilbe hasemani* (57 = 30.8 %), *Pimelodella gracilis* (17 = 9.1 %), *Aphyocharax dentatus* (12 = 6.4 %), *Prionobrama filigera* (11 = 5.9 %), and *Knodus victoriae* (10 = 5.4 %). Other species includes: *Abramites hypselonotus, Aphanotorulus frankei Clupeacharax anchoveoides, Moenkhausia dichroura, Paragoniates alburnus, Pimelodella serrata, Rineloricaria lanceolata Roeboides* sp., and *Thoracocharax stellatus* among others. Station with medium to high diversity. Fishes typical of rapids.

Field Station 96-P-02-23

Locality: Rio Tahuamanu, small rapids just above mouth of Rio Nareuda. 11° 18' 51" S, 68° 44' 35" W, 12/Sep/1996.

White turbid water river (100 mts wide). The shore and bottom are rocky, sandy/muddy. No aquatic plants. A total of 32 specimens were collected.

The species list includes:

Characiformes = 5

Siluriformes = 10

Gymnotiformes = 1

Species total = 16

The most abundant species are: *Knodus gamma* (5 = 15.6 %), *Abramites hypselonotus* (4 = 12.5 %), *Pimelodella gracilis* (4 = 12.5 %), *Odontostilbe paraguayensis* (3 = 9.0 %), and *Pimelodus pantherinus* (2 = 5.8 %). Other species includes: *Aphanotorulus frankei, Eigenmannia virescens, Galeocharax gulo, Leiarius marmoratus, Panaque* sp., *Peckoltia arenaria*, and *Prionobrama filigera* among others. Station with low diversity, however included first records of some species such as *Panaque* and *Leiarius marmoratus*.

Field Station 96-P-02-24

Locality: Lake with canal off Rio Tahuamanu, 1.93 km below mouth of Rio Nareuda. 11° 17' 32" S, 68° 44' 35" W, 12/Sep/1996.

White turbid water flooded lake. The shore and bottom are muddy with some submerged terrestrial plants. No aquatic plants. A total of 95 specimens were collected.

The species list includes:

Characiformes = 14

Siluriformes = 3

Perciformes = 3

Species total = 20

The most abundant species are: *Odontostilbe paraguayensis* (20 = 21.1 %), *Aequidens paraguayensis* (14 = 14.7 %), *Hemigrammus lunatus* (13 = 13.6 %), *Odontostilbe hasemani* (13 = 13.6 %), and *Cyphocharax spiluropsis* (10

= 10.5 %). Other species includes: *Aphanotorulus frankei, Crenicichla heckeli, Gasteropelecus sternicla, Moenkhausia colletti, M. dichroura,* and *Prionobrama filigera* among others. Station with low diversity.

Field Station 96-P-02-25

Locality: Small arroyo leaving the forest just below mouth of Rio Nareuda. 11° 18' 32" S, 68° 44' 21" W, 12/Sep/1996.

White water creek (0.5 mts wide). The shore and bottom are sandy/muddy with some submerged logs and leaves. No aquatic plants. A total of 13 specimens were collected.

The species list includes:

Characiformes = 2

Siluriformes = 5

Species total = 7

The most abundant species are: *Doras* cf. *carinatus* (6 = 46.2 %) and *Otocinclus mariae* (2 = 15.3 %). Other species includes: *Bunocephalus aleuropsis, Characidium* sp., *Farlowella* sp., *Hoplias malabaricus, Imparfinis stictonotus*, and *Prionobrama filigera* among others. Station with very low diversity, however was a good collection of *Doras* cf. *carinatus*.

Field Station 96-P-02-26

Locality: Rio Tahuamanu from mouth of Rio Nareuda to below Cachuelita. (Trawl). Latitude and longitude unavailable, 13/Sep/1996.

White turbid water river (100 mts wide). The shore and bottom are sandy/muddy with some submerged logs and leaves. A total of 258 specimens were collected.

The species list includes:

Characiformes = 6

Siluriformes = 18

Gymnotiformes = 1

Other = 1

Species total = 29

The most abundant species are: *Megalonema* sp. nov. (116 = 44.9 %), *Creagrutus* sp. A (31 = 12 %), *Pimelodus* altipinnis (28 = 10.8 %), *Loricaria* sp. (15 = 5.8%), and *Creagrutus* sp. B (10 = 3.8 %). Other species includes: *Crossoloricaria* sp., *Eigenmannia macrops, E. virescens, Lamontichthys filamentosus, Opsodoras stubelii, Panaque* sp., *Plectrochilus* sp., *Trachydoras atripes*, and *Xiliphius melanopterus* among others. This is an interesting collection using trawls. Several new records were found in this area.

Field Station 96-P-02-27

Locality: Rio Tahuamanu at sand island 1.93 km below mouth of Rio Nareuda (same as P02-15). 11° 17' 33" S, 68° 44' 28" W, 13/Sep/1996.

White turbid water river (100 mts wide). The shore and bottom are muddy. No aquatic plants. A total of 379 specimens were collected.

The species list includes:

Characiformes = 15

Siluriformes = 10

Gymnotiformes = 2

Species total = 27

The most abundant species are: *Aphyocharax dentatus* (196 = 51.7 %), *Moenkhausia dichroura* (50 = 13.1 %), *Aphanotorulus frankei* (28 = 7.3 %), *Pimelodella gracilis* (13 = 3.4 %), and *Pimelodella itapicuruensis* (11 = 2.9 %). Other species includes: *Cheirocerus eques, Clupeacharax anchoveoides, Eigenmannia macrops, E. virescens, Farlowella* sp., *Knodus* spp. (4), *Megalonema* sp. nov., *Odontostilbe hasemani, Pimelodella serrata, Prionobrama filigera, Sturisoma nigrirostrum,* and *Thoracocharax stellatus* among others. Station with medium diversity.

Manuripi/Lower Tahuamanu Sub-Basins (Stations P02-28 to P02-46)

Field Station 96-P-02-28

Locality: Rio Manuripi above camp to the south ca 9 km.Latitude and longitude unavailable, 15/Sep/1996.

White turbid water river (75 mts wide). The shore and bottom are sand/muddy. No aquatic plants. Gallery forest in margins. A total of 175 specimens were collected.

The species list includes:

Characiformes = 14

Siluriformes = 10

Gymnotiformes = 4

Perciformes = 1

Species total = 29

The most abundant species are: *Moenkhausia colletti* (51 = 29.1 %), *Moenkhausia lepidura* (37 = 21.1 %), *Hemigrammus* sp. (16 = 9.1 %), *Ctenobrycon spilurus* (11 = 6.2 %), and *Ochmacanthus alternus* (10 =5.7 %). Other species includes: *Astyanax abramis, Carnegiella strigata, Corydoras loretoensis, Eigenmannia humboldtii, E. virescens, Hypoptopoma joberti, Knodus caquetae, Parotocinclus* sp., *Poptella compressa, Rineloricaria lanceolata, Sternopygus macrurus*, and *Stethaprion crenatum* among others. Station with medium diversity.

Field Station 96-P-02-29

Locality: Rio Manuripi at beach 5.78 km from camp, 23 km. from Puerto Rico. 11° 11' 13" S, 67° 33' 20" W, 15/Sep/1996.

White turbid water river (75 mts wide). The shore and bottom are muddy with some aquatic plants and grasses. A total of 216 specimens were collected.

The species list includes:

Characiformes = 13

Siluriformes = 11

Gymnotiformes = 5

Perciformes = 2

Species total = 31

The most abundant species are: *Pimelodella gracilis* (46 = 21.3 %), *Hemigrammus* sp. (30 = 13.9 %), *Moenkhausia lepidura* (24 = 11.1 %), *Moenkhausia colletti* (23 = 10.6 %), and *Ctenobrycon spilurus* (11 = 5.1 %). Other species includes: *Adontosternarchus clarkae, Apistogramma* sp., *Carnegiella myersi, Eigenmannia trilineata, E. humboldtii, E. macrops, Gasteropelecus sternicla, Hemiodontichthys acipenserinus, Hoplias malabaricus, Parotocinclus* sp., *Sternopygus macrurus*, and *Sturisoma nigrirostrum* among others. Station with medium to high diversity.

Field Station 96-P-02-30

Locality: Rio Manuripi from below camp to Puerto Rico. (Trawl). 11° 08' 06" S, 67° 33' 20" W, 15/Sep/1996.

White turbid water river (75 mts wide). The shore and bottom are clean mud. Grasses on shore. A total of 75 specimens were collected.

The species list includes:

Characiformes = 4

Siluriformes = 10

Gymnotiformes = 6

Species total = 20

The most abundant species are: *Creagrutus* sp. (16 = 21.3 %), *Opsodoras stubelii* (10 = 13.3 %), *Doras* cf. *carinatus* (9 = 12 %), *Eigenmannia macrops* (8 = 10.6 %), and *Eigenmannia virescens* (6 = 8 %). Other species includes: *Adontosternarchus clarkae, Apteronotus bonapartii, Hemidoras microstomus, Moenkhausia megalops, Pimelodus altipinnis, Rhabdolichops caviceps, Serrasalmus hollandi,* and *Tympanopleura* sp. among others. Station with low diversity, however several species were new for the expedition.

Field Station 96-P-02-31

Locality: Lagoon off Rio Manuripi, 1.99 km from camp up river, 5.3 km from Puerto Rico. (Gillnet). 11° 09' 06" S, 67° 33' 43" W, 15/Sep/1996.

White turbid water flooded lagoon. The shore and bottom are muddy with some submerged terrestrial plants. Abundant aquatic plants. A total of 65 specimens were collected.

The species list includes:

Characiformes = 15

Siluriformes = 6

Perciformes = 1

Species total = 22

The most abundant species are: *Pygocentrus nattereri* (10 = 15.3 %), *Mylossoma duriventre* (8 = 12.3 %), *Loricariichthys* sp. (6 = 9.2%), *Potamorhina altamazonica* (4 = 6.1 %), and *Potamorhina lattior* (4 = 6.1 %). Other species includes: *Astronotus crassipinnis, Curimatella myersi, Cynodon gibbus, Liposarcus disjunctivus, Prochilodus nigricans, Psectrogaster rutiloides, Pseudodoras niger, Serrasalmus marginatus,* and *Serrasalmus rhombeus* among others. Station with medium diversity.

Field Station 96-P-02-32

Locality: Rio Manuripi at beach outside lagoon, 1.93 km upriver from camp, 5.3 km from Puerto Rico. 11° 09' 05" S, 67° 33' 40" W, 15/Sep/1996.

White turbid water river (75 mts wide). The shore and bottom are muddy. Some aquatic plants

and grasses in margins. A total of 95 specimens were collected.

The species list includes:

Characiformes = 20

Siluriformes = 17

Gymnotiformes = 4

Perciformes = 2

Species total =43

The most abundant species are: *Eigenmannia macrops* (98 = 22.6 %), *Pimelodella itapicuruensis* (68 = 15.7 %), *Ctenobrycon spilurus* (58 = 13.4 %), *Cyphocharax spiluropsis* (46 = 10.6 %), and *Pimelodella gracilis* (39 = 9.0 %). Other species includes: *Auchenipterichthys thoracatus, Ageneiosus caucanus, Apistogramma linkei, Cheirocerus eques, Curimatella dorsalis, Cyphocharax plumbeus, Distocyclus conirostris, Eigenmannia virescens, E. macrops, Hemidoras microstomus, Hemisorubim platyrhynchos, Mesonauta festivus, Ochmacanthus alternus, Pimelodus blochii, Prionobrama filigera, Trachydoras paraguayensis*, and *Triportheus angulatus* among others. Station with high diversity.

Field Station 96-P-02-33

Locality: Rio Manuripi at beach 6.36 km upriver from camp, 9.78 km from Puerto Rico. 11° 11' 30" S, 67° 33' 45" W, 16/Sep/1996.

White turbid water river. The shore and bottom are sandy/muddy. No aquatic plants, but the beach across the river had some grasses. A total of 176 specimens were collected.

The species list includes:

Characiformes = 9

Siluriformes = 9

Gymnotiformes = 3

Species total = 21

The most abundant species are: *Moenkhausia lepidura* (55 = 31.3 %), *Moenkhausia colletti* (26 = 14.8 %), *Entomocorus benjamini* (25= 14.2 %), *Ctenobrycon spilurus* (14= 7.9 %), and *Hypoptopoma joberti* (10 = 5.7 %). Other species includes: *Cochliodon cochliodon, Corydoras acutus, Eigenmannia macrops, Knodus caquetae, Rineloricaria lanceolata*, and *Sternopygus macrurus* among others. Station with low diversity.

Field Station 96-P-02-34

Locality: Rio Manuripi at beach on E side of river 5.05 km upriver from camp. 11° 10' 49" S, 67° 33' 30" W, 16/Sep/1996.

White turbid water river (75 mts wide). The shore and bottom are muddy with some terrestrial plants. Some aquatic plants. A total of 551 specimens were collected.

The species list includes:

Characiformes = 24

Siluriformes = 13

Gymnotiformes = 1

Perciformes = 4

Species total = 43

The most abundant species are: *Moenkhausia colletti* (106 = 19.2 %), *Pimelodella gracilis* (104 = 18.8 %), *Corydoras loretoensis* (88 = 15.9 %), *Apistogramma* sp. (44 = 8.0 %), and *Knodus caquetae* (41 = 7.4 %). Other species includes: *Anchoviella carrikeri, Brochis splendens, Bunocephalus* sp., *Corydoras acutus, Ctenobrycon spilurus, Eigenmannia virescens, Gasteropelecus sternicla, Hemiodontichthys acipenserinus, Imparfinis stictonotus, Mesonauta festivus, Piabucus melanostomus,* and *Prionobrama filigera* among others. Station with high diversity.

Field Station 96-P-02-35

Locality: Rio Manuripi close to Puerto Rico. 11° 08' 06" S, 67° 33' 20" W, 16/Sep/1996.

White turbid water river (75 mts wide). The shore and bottom are muddy with some submerged logs. No aquatic plants. Disturbed forest. A total of 103 specimens were collected.

The species list includes:

Characiformes = 5

Siluriformes = 10

Gymnotiformes = 2

Perciformes = 1

Species total = 18

The most abundant species are: *Creagrutus* sp. (46 = 44.6 %), *Eigenmannia macrops* (11 = 10.6 %), *Moenkhausia megalops* (11 = 10.6 %), *Pimelodus blochii* (8 = 7.7 %), and *Megalonema* sp. nov. (8 = 7.7 %). Other species includes: *Corydoras acutus, Crenicichla heckeli, Eigenmannia virescens, Hemidoras microstomus,*

Opsodoras humeralis, Pimelodella gracilis, and *Serrasalmus hollandi* among others. Station with low diversity.

Field Station 96-P-02-36

Locality: Rio Tahuamanu near mouth into Rio Manuripi, at sandy beach and backwater, 1 km above Puerto Rico. 11° 06' 43" S, 67° 33' 46" W, 17/Sep/1996

White turbid water and blackwater mixed. The shore and bottom are muddy. Some aquatic plants in backwater. A total of 220 specimens were collected.

The species list includes:

Characiformes = 20

Siluriformes = 13

Gymnotiformes = 1

Perciformes = 4

Species total = 38

The most abundant species are: *Tympanopleura* sp. (35 = 15.9 %), *Prionobrama filigera* (34 = 15.4 %), *Aphanotorulus frankei* (17 = 7.7 %), *Poptella compressa* (12 = 5.5 %), *Pimelodella gracilis* (11 = 5.0 %), and *Engraulisoma taeniatum* (11 = 5.0 %). Other species includes: *Astyanax abramis, Corydoras loretoensis, Crenicichla heckeli, Doras* cf. *carinatus, Galeocharax gulo, Knodus victoriae, Paragoniates alburnus, Prochilodus nigricans, Serrasalmus hollandi*, and *Thoracocharax stellatus* among others. Station with medium to high diversity. Notice the high density of *Tympanopleura* sp.

Field Station 96-P-02-37

Locality: Lagoon and backwater off Rio Manuripi, 1.7 km above Puerto Rico. 11° 06' 57" S, 67° 32' 54" W, 17/Sep/1996.

White turbid water flooded lake and swamp. The shore and bottom are muddy. Abundant aquatic plants and grasses. A total of 620 specimens were collected.

The species list includes:

Characiformes = 21

Siluriformes = 16

Gymnotiformes = 2

Perciformes = 4

Species total = 43

The most abundant species are: *Parotocinclus* sp. (117 = 18.8 %), *Corydoras loretoensis* (97 = 15.6 %), *Cyphocharax spiluropsis* (80 = 12.9 %), *Moenkhausia dichroura* (43 = 6.9 %), *Carnegiella myersi* (42 = 6.7), and *Ctenobrycon spilurus* (39 = 6.2 %). Other species includes: *Abramites hypselonotus, Amblydoras hancockii, Anadoras grypus, Aphanotorulus frankei, Bunocephalus coracoideus, Cochliodon cochliodon, Eigenmannia trilineata, Hemigrammus ocellifer, Iguanodectes spilurus, Moenkhausia sanctaefilomenae, Pimelodella gracilis, Poptella compressa, Rineloricaria* sp., and *Serrasalmus hollandi* among others. Station with high diversity.

Field Station 96-P-02-38

Locality: Lagoon and backwater off Rio Manuripi, 2.63 km above Puerto Rico. 11o 07' 39" S, 67o 33' 30" W, 17/Sep/1996

White turbid water lagoon. The shore and bottom are muddy. Some aquatic plants. A total of 232 specimens were collected.

The species list includes:

Characiformes = 9

Siluriformes = 7

Gymnotiformes = 2

Perciformes = 3

Species total = 21

The most abundant species are: *Corydoras loretoensis* (100 = 43.1 %), *Apistogramma linkei* (47 = 20.2 %), *Moenkhausia colletti (*20 = 8.6 %), *Amblydoras hancockii* (9 = 3.8 %), *Eigenmannia virescens* (9 = 3.8 %), and *Ctenobrycon spilurus* (9 = 3.8 %). Other species includes: *Carnegiella myersi, Corydoras acutus, Eigenmannia humboldtii, Mesonauta festivus, Moenkhausia dichroura, Pimelodella gracilis*, and *Triportheus angulatus* among others. Station with low diversity.

Field Station 96-P-02-39

Locality: Rio Tahuamanu near mouth into Rio Manuripi, at sandy beach and backwater, 1 km above Puerto Rico. 11° 08' 35" S, 67° 33' 23" W, 18/Sep/1996.

White turbid water and blackwater mixed. The shore and bottom are muddy. Some aquatic plants in backwater. A total of 389 specimens were collected.

The species list includes:

Characiformes = 16

Siluriformes = 14

Gymnotiformes = 4

Perciformes = 2

Species total = 34

The most abundant species are: *Corydoras loretoensis* (116 = 29.8 %), *Moenkhausia lepidura* (67 = 17.2 %), *Pimelodella gracilis* (51 = 13.1 %), *Moenkhausia colletti* (40 = 10.2 %), *Knodus victoriae* (15 = 3.8 %), and E*igenmannia virescens* (15 = 3.8 %). Other species includes: *Corydoras acutus, Crenicichla heckeli, Ctenobrycon spilurus, Entomocorus benjamini, Gasteropelecus sternicla, Pimelodella cristata, Serrasalmus hollandi*, and *Vandellia cirrhosa* among others. Station with medium to high diversity. Notice the high density of Corydoras that are popular in the aquarium trade.

Field Station 96-P-02-40

Locality: Small cocha on E side of Rio Manuripi, 1.5 km above camp, 4.95 km from Puerto Rico. 11° 08' 54" S, 67° 33' 32" W, 18/Sep/1996.

Brackish water lagoon. The shore and bottom are muddy. Some aquatic plants and grasses. A total of 505 specimens were collected.

The species list includes:

Characiformes = 16

Siluriformes = 11

Gymnotiformes = 1

Perciformes = 6

Species total = 34

The most abundant species are: *Corydoras loretoensis* (224 = 44.3 %), *Brachyrhamdia marthae* (47= 9.3 %), *Amblydoras hancockii* (30 = 5.9 %), *Apistogramma linkei* (29 = 5.7 %), and Ctenobrycon spilurus (23= 4.5 %). Other species includes: *Cheirodon piaba, Crenicara unctulata, Hemigrammus ocellifer, Hoplosternum thoracatus, Moenkhausia colletti, Nannostomus trifasciatus, Pimelodella boliviana, Pyrrhulina vittata*, and *Rineloricaria lanceolata* among others. Station with medium to high diversity. Notice the high density of species important to the aquarium trade.

Field Station 96-P-02-41

Locality: Rio Manuripi, at small lagoon 5.27 km above Puerto Rico. 11o 09' 03" S, 67o 33' 40" W, 18/Sep/1996.

White turbid water. The shore and bottom are muddy. Some aquatic plants and grasses in margins. A total of 628 specimens were collected.

The species list includes:

Characiformes =14

Siluriformes = 12

Gymnotiformes = 3

Perciformes = 3

Species total = 32

The most abundant species are: *Corydoras loretoensis* (310 = 49.3 %), *Pimelodella itapicuruensis* (96 = 15.3 %), *Pimelodella gracilis* (49 = 7.8 %), *Cyphocharax spiluropsis* (32 = 5.1 %), and *Gasteropelecus sternicla* (17 = 2.7 %). Other species includes: *Apistogramma linkei, Cheirodon piaba, Corydoras acutus, Eigenmannia virescens, Hoplias malabaricus, Mesonauta festivus, Ochmacanthus alternus, Pimelodella cristata, Rineloricaria lanceolat*a, and *Sternopygus macrurus* among others. Station with medium to high diversity. Notice the high density of *Corydoras loretoensis*.

Field Station 96-P-02-42

Locality: Rio Manuripi from the camp 3.47 km above Puerto Rico. 11° 08' 06" S, 67° 33' 20" W, 18/Sep/1996.

White turbid water river (75 mts wide). The shore and bottom are muddy. Some aquatic plants and grasses in margins. A total of 12 specimens were collected.

The species list includes:

Siluriformes = 2

Species total = 2

The two species are: *Pimelodus blochii* (10 = 83.3 %) and *Opsodoras stubelii* (2 = 16.7 %). Trawl.

Field Station 96-P-02-43

Locality: Lagoon off Rio Manuripi, 0.81 km above Puerto Rico. 11° 06' 39" S, 67° 33' 23" W, 19/Sep/1996.

White turbid water lagoon. The shore and bottom are muddy. Some aquatic plants and grasses in margins. A total of 1083 specimens were collected.

The species list includes:

Characiformes = 17

Siluriformes = 15

Perciformes = 9

Species total = 41

The most abundant species are: *Ctenobrycon spilurus* (223 = 20.5 %), *Amblydoras hancockii* (194 = 17.9 %), *Corydoras loretoensis* (143 = 13.2%), *Hemigrammus lunatus* (105 = 9.6 %), *Hemigrammus unilineatus* (92 = 8.5 %), and *Apistogramma* sp. A (89 = 8.2 %). Other species includes: *Ancistrus* sp., *Astrodoras asterifrons, Astyanax abramis, Brachyrhamdia marthae, Chaetobranchiopsis orbicularis, Corydoras napoensis, Dianema longibarbis, Cichlasoma severum, Liposarcus disjunctivus, Mesonauta festivus, Moenkhausia colletti, M. dichroura, Pimelodella cristata, P. gracilis, Pimelodus pantherinus, P. blochii, Rineloricaria lanceolata,* and *Satanoperca acuticeps* among others. Station with high diversity. Notice the high diversity of species important in the aquarium trade.

Field Station 96-P-02-44

Locality: Lagoon behind island of camp on NE side, 3.47 km upriver from Puerto Rico. 11° 08' 06" S, 67° 33' 20" W, 20/Sep/1996.

Whitewater flooded lagoon. The shore and bottom are muddy with logs and leaves. Some aquatic plants and grasses. A total of 421 specimens were collected.

The species list includes:

Characiformes = 10

Siluriformes = 8

Perciformes = 4

Other = 1

Species total = 23

The most abundant species are: *Hemigrammus unilineatus* (250 = 59.4 %), *Apistogramma* sp. A (38 = 9.0 %), *Corydoras loretoensis* (27 = 6.4 %), *Pyrrhulina vittata* (25 = 5.9 %), and *Ctenobrycon spilurus* (16 = 3.8 %). Other species includes: *Aequidens* sp., *Amblydoras hancockii, Cypho-charax spiluropsis, Dianema longibarbis, Hemi-grammus ocellifer, Iguanodectes spilurus, Rineloricaria lanceolata,* and *Tridentopsis pearsoni* among others. Station with low diversity. Notice the high density of *Hemigrammus unilineatus*.

Field Station 96-P-02-45

Locality: Rio Manuripi, in front of camp 3.47 km above Puerto Rico. 11° 08' 06" S, 67° 33' 20" W, 20/Sep/1996.

White turbid water river. The shore and bottom are muddy. Some aquatic plants and grasses in margins. A total of 349 specimens were collected.

The species list includes:

Characiformes = 15

Siluriformes = 7

Gymnotiformes = 1

Species total = 23

The most abundant species are: *Moenkhausia colletti* (74 = 21.2 %), *Corydoras loretoensis* (69 = 19.8 %), *Moenkhausia lepidura* (67 = 19.2 %), *Ctenobrycon spilurus* (44= 12.6 %), *Pimelodella gracilis* (32 = 9.1 %), and *Prionobrama filigera* (14 = 4.0 %). Other species includes: *Carnegiella myersi, Eigenmannia virescens, Moenkhausia dichroura, Pimelodella cristata, Poptella compressa,* and *Stethaprion crenatum* among others. Station with medium to low diversity.

Field Station 96-P-02-46

Locality: Rio Manuripi, lagoon SW side of island 3.47 km upriver from Puerto Rico. 11° 08' 06" S, 67° 33' 20" W, 20/Sep/1996.

White turbid water flooded lagoon. The shore and bottom are muddy. Some aquatic plants and grasses in margins. A total of 54 specimens were collected.

The species list includes:

Characiformes = 5

Siluriformes = 4

Perciformes = 2

Species total = 11

The most abundant species are: *Cyphocharax spiluropsis* (15 = 27.7 %), *Amblydoras hancockii* (13 = 24.1 %), *Astrodoras asterifrons* (7 = 13 %), *Parotocinclus* sp. (7= 13%), and *Curimatella dorsalis* (4 = 7.4 %). Other species includes: *Auchenipterichthys thoracatus*, *Apistogramma linkei, Hoplias malabaricus*, *Mesonauta festivus*, and *Moenkhausia colletti*. Station with low diversity.

LIST OF IDENTIFIED SPECIES SAMPLED IN THE MANURIPI AND TAHUAMANU BASINS

J. Sarmiento, B. Chernoff, S. Barrera, A. Machado-Allison, N. Menezes y H. Ortega

(Modified from Aquarap, 1999)

Potamotrygon motoro
Anchoviella cf *carreri*
Abramites hypselonotus
Laemolyta sp
Leporinus cf *fasciatus*
Leporinus friderici
Leporinus cf *nattereri*
Schizodon fasciatus
Aphyocharax alburnus
Aphyocharax dentatus
Aphyocharax pusillus
Astyanax cf *abramis*
Astyanax sp
Brachychalcinus copei
Bryconamericus cf *caucanus*
Bryconamericus cf *pachacuti*
Bryconamericus cf *peruanus*
Bryconamericus sp
Characidium sp 1
Characidium sp 2
Charax gibbosus
Cheirodon fugitiva
Cheirodon sp 1
Cheirodon sp 2
Clupeocharax anchoveoides
Creagrutus sp 1
Creagrutus sp 2
Creagrutus sp 3
Ctenobrycon spilurus
Cynopotamus gouldingi
Engraulisoma taeniatum
Eucynopotamus biserialis
Galeocharax gulo
Gephyrocharax sp
Hemigrammus lunatus
Hemigrammus cf *megaceps*
Hemigrammus ocellifer
Hemigrammus cf *pretoensis*
Hemigrammus sp
Hyphessobrycon cf *tucunai*
Hysteronotus sp 1
Hysteronotus sp 2
Iguanodectes spilurus
Knodus cf *caquetae*
Knodus gamma
Knodus heterestes
Knodus sp
Knodus victoriae
Metynnis luna
Microschemobrycon geisleri
Moenkhausia chrysargyrea
Moenkhausia colleti
Moenkhausia cf *comma*
Moenkhausia cf *jamesi*
Moenkhausia cf *lepidura*
Moenkhausia cf *megalops*
Moenkhausia sp 1
Moenkhausia sp 2
Moenkhausia sp 3
Moenkhausia sp 4
Moenkhausia sp 5
Moenkhausia sp 6
Moenkhausia sp 7
Moenkhausia sp 8
Myleus sp
Mylossoma duriventre
Odontostilbe hasemani
Odontostilbe piaba
Odontostilbe paraguayensis
Odontostilbe sp 1
Odontostilbe sp 2
Paragoniates alburnus
Phenacogaster microstictus
Phenacogaster pectinatus
Phenacogaster sp 1
Phenacogaster sp 2
Phenacogaster sp 3
Piabucus melanostomus
Poptella compressa
Prionobrama filigera
Pristobrycon sp
Pygocentrus nattereri
Roeboides cf myersi
Roeboides sp 1
Roeboides sp 2
Roeboides sp 3
Serrasalmus cf *hollandi*
Serrasalmus marginatus
Serrasalmus rhombeus
Serrasalmus sp
Stethaprion crenatum
Tetragonopterus argenteus
Triportheus angulatus
Triportheus sp
Tyttocharax madeirae
Tyttocharax tambopatensis
Tyttocharax spn
Curimatella alburna
Curimatella dorsalis
Curimatella inmaculata
Curimatella meyeri
Cyphocharax cf *plumbeus*
Cyphocharax spiluropsis
Cyphocharax sp
Potamorhina altamazonica
Potamorhina laitior
Psectrogaster curviventris
Psectrogaster rutiloides
Steindachnerina dobula
Steindachnerina guentheri
Steindachnerina leucisca
Steindachnerina sp
Cynodon gibbus
Hydrolicus pectoralis
Raphiodon vulpinus
Hoplias malabaricus
Carnegiella myersi
Carnegiella strigata
Gasteropelecus sternicla
Thoracocharax stellatus
Anodus elongatus
Nannostomus trifasciatus
Pyrrhulina australe
Pyrrhulina vittata
Prochilodus cf *nigricans*
Ageneiosus cf *caucanus*
Ageneious sp
Tympanopleura sp
Bunocephalus coracoideus
Bunocephalus sp 1
Bunocephalus sp 2
Bunocephalus sp 3
Dysichthys bifidus
Dysichthys cf *aleuropsis*
Dysichthys cf *amazonicus*
Dysichthys cf *depressus*
Xiliphius cf *melanopterus*
Auchenipterus thoractus
Auchenipterus cf *nuchalis*
Centromoclus cf *heckeli*
Entomocorus benjamini
Tatia altae
Tatia aulopigia
Tatia cf *perugiae*
Trachelyopterus galeatus
Brochis splendens
Callichthys callichthys
Corydoras acutus
Corydoras aeneus
Corydoras hastatus
Corydoras cf *loretoensis*
Corydoras cf *napoensis*
Corydoras trilineatus
Corydoras sp
Dianema longibarbis
Megalechis thoracatus
Pseudocetopsis sp
Acanthodoras cataphractus
Agamyxis pectinifrons
Amblydoras cf *hancockii*
Anadoras cf *grypus*
Astrodoras asterifrons
Doras cf *carinatum*
Doras eigenmanni
Hemidoras microstomus

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(Modified from Aquarap, 1999) (CONT.)

Opsodoras cf *humeralis*
Opsodoras cf *stubelli*
Platydoras costatus
Psudodoras niger
Trachydoras cf *atripes*
Trachydoras paraguayensis
Ancistrus sp 1
Ancistrus sp 2
Ancistrus sp 3
Ancistrus sp 4
Aphanotorulus frankei
Aphanotorulus unicolor
Cochliodon cf *cochliodon*
Crossoloricaria sp
Fralowella cf *oxyrryncha*
Farlowella sp 1
Farlowella sp 2
Glyopterichthys lituratus
Hemiodon. acipenserinus
Hypoptopoma joberti
Hypoptopoma sp
Hypostomus sp 1
Hypostomus sp 2
Hypostomus sp 3
Hypostomus sp 4
Lamontichthys filamentosus
Liposarcus disjunctivus
Loricaria sp 1
Loricaria sp 2
Loricariichthys sp
Otocinclus mariae
Panaque sp
Parotocinclus sp
Peckoltia arenaria
Planiloricaria cryptodon
Pseudohemiodon cf *lamina*
Pseudohemiodon sp 1
Pseudohemiodon sp 2
Pseudohemiodon sp 3
Rineloricaria lanceolata
Rineloricaria sp
Scoloplax cf *dicra*
Sturisoma nigrirostrum
Brachyglannis sp (?)
Brachyrhamdia marthae
Cetopsorhamdia phantasia
Cheirocerus eques
Duopalatinus cf *malarmo*
Hemisorubim platyrhynchos
Heptapterus longior
Heptapterus sp
Imparfinis stictonotus
Imparfinis sp
Leiarius marmoratus
Megalonema sp
Megalonema spn
Microglanis sp
Pimelodella cf *boliviana*
Pimelodella cristata
Pimelodella gracilis
Pimelodella hasemani
Pimelodella cf *itapicurensis*
Pimelodella cf *serrata*
Pimelodus "altipinnis"
Pimelodus spn
Pimelodus armatus
Pimelodus cf *blochii*
Pimelodus cf *pantherinus*
Pimelodus sp 1
Pimelodus sp 2
Pimelodus sp 3
Pimelodus sp 4
Pseudoplatystoma fasciatum
Rhamdia sp
Sorubim lima
Acanthopoma cf *bondi*
Homodiaetus sp
Ochmacanthus cf *alternus*
Plectrochilus sp
Pseudostegophilus nemurus
Tridentopsis pearsoni
Vandellia cirrhosa
Adontosternarchus clarkae
Apteronotus albifrons
Apteronotus bonapartii
Electrophorus electricus
Gymnotus cf *anguillaris*
Gymnotus carapo
Gymnotus cf *coatesi*
Brachyhypopomus brevirostris
Brachyhypopomus pinnicaudatus
Brachyhypopomus sp
Hypopygus lepturus
Dystociclus conirostris
Eigenmannia humboldtii
Eigenmannia macrops
Eigenmannia cf trilineata
Eigenmannia virescens
Rhabdolichops caviceps
Sternopygus macrurus
Rivulus sp
Potaqmorrhaphis sp
Synbranchus marmoratus
Aequidens cf *paraguayensis*
Aequidens tetramerus
Aequidens sp 1
Aequidens sp 2
Aequidens sp 3
Apistogramma linkei
Apistogramma sp 1
Apistogramma sp 2
Apistogramma sp 3
Apistogramma sp 4
Astronotus crassipinnis
Chaetobranchus orbicularis
Cichla monoculus
Cichlasoma severum
Crenicara cf *unctulata*
Crenicichla cf heckeli
Crenicichla sp 1
Crenicichla sp 2
Mesonauta festivum
Mesonauta cf insignis
Mikrogeophagus altispinosa
Satanoperca cf *acuticeps*
Satanoperca sp
Pachyurus sp
Plagioscion squamosissimus