
Proposed Plan for Developing the Aquarium Fish Trade in the Iwokrama Forest & the North Rupununi

Iwokrama International Centre & the North Rupununi District Development Board

Draft for discussion and consultation with North Rupununi communities and other stakeholders

February 2002

Table of Contents

Summary.....	3
Project Rationale.....	4
Background.....	4
Project Description.....	9
Goals.....	9
Objectives.....	9
Activities.....	10
Time Line.....	13
Project Monitoring and Evaluation.....	13
Community Involvement.....	13

Summary

Several alternative income generation activities are proposed for development by the Iwokrama Centre and the NRDDDB under a sustainable utilization area and a broad integrated fisheries management plan respectively. The development of the NRDDDB's plan is facilitated by the Iwokrama Centre, and involve the communities of the North Rupununi, the Environmental Protection Agency and the Ministry of Fisheries, Crops and Livestock. The proposed plans include fish farming, Arapaima management and trading in ornamental fish; these activities have arisen from recommendations during workshops and on natural resource management in the Rupununi and Guyana.

In this document, we develop the idea of the aquarium fish trade as a sustainable business in the North Rupununi that would potentially be used by Iwokrama. This document presents the idea to stakeholders to encourage them to add their inputs. The document provides a background that includes the biophysical nature of the North Rupununi; the status of its fish fauna; and considers issues that affect Iwokrama's and the community's capacity to effectively monitor and conserve their natural resources. The background also discusses prior work done by the NRDDDB and the Iwokrama Centre in nurturing and developing the project to its present stage.

This project plan presents objectives and a draft work plan and timeline for project activities. The document recommends which communities should be involved in the trade and describes the infrastructural and institutional systems that need to be developed for project implementation. Suggested infrastructural needs include developing a holding station and purchasing fishing and shipping equipment. From an institutional perspective, community organizational systems must improve, an operational or work plan for the trade needs to be developed, community members need training in financial management, harvest management, marketing, and research. The plan also presents mechanisms for ensuring accountability and for effectively managing the project. A key issue will be to define a clear set of indicators that will accurately allow the NRDDDB and Iwokrama to monitor and evaluate the project

Project Rationale

Background

The North Rupununi Savannas

The Rupununi Savannas are separated from the Brazilian savannas by the Ireng and Takutu rivers that come together to form the Rio Branco. The Rupununi Savannas further divide into the North and South Rupununi Savannas the Kanuku Mountains. The Northern savannas are approximately 8,000 km² with vegetation that includes grasses, sedges, forbs, shrubs, trees, and woody herbs. May to September is generally the only rainy season, which accumulates an average rainfall of 1780 mm but with considerable year-to-year variation.

The North Rupununi Wetlands

The North Rupununi Wetlands represent habitats that are internationally significant. The ecosystem includes drainages of the Siparuni, Burro-burro, Lower Essequibo, Lower Rewa, Tumalao, and Lower Rupununi Rivers. Earlier surveys revealed healthy populations of Pimelodid catfish (*Phractocephalus hemiliopterus*, *Brachyplatystoma* spp., *Paulicea luetkeni*, *Pseudoplatystoma* spp.), recovering populations of Arapaima (*Arapaima gigas*), large Characids (*Colossoma bidens*, *Myleus pacu*), the Peacock Bass or Lukanani (*Cichla ocellaris*), and the Fresh Water Drum (*Plagioscion squamosissimus*).

In addition, many of Guyana's rare, endangered, and charismatic mega-faunal species such as the Giant River Turtles (*Podocnemis expansa*), Black Caiman (*Melanosuchus niger*), and Giant Otters (*Pteronura brasiliensis*) live in the Rupununi, Rewa, and Essequibo Rivers. During the wet season the flooded lowland forests and savannas provide an important spawning ground for fish from the Essequibo River. This phenomenon coupled with transient linkages to the Amazon basin may influence the high species richness.

Fish are the major source of protein in the region. As such, fishing is an extremely important subsistence activity. Present rates of exploitation of Arapaima and River Turtles are apparently not sustainable. These fisheries resources are open access – that is there are no laws that regulate any Guyanese from using the resources. There is growing pressure on the fisheries from Lethem, Brazil and Georgetown fishermen; as well as an increasing focus on local income generation from the fisheries for Apoteri, Rewa, Fairview and Crash Water.

The North Rupununi District Development Board

The NRDDDB was established in 1996 as a sub-regional NGO originally representing 12, and now 14, mainly Makushi communities in the North Rupununi. The NRDDDB coordinates several natural resource management programmes such as education, environmental, development, and research in the North Rupununi. A major component of viable natural resource management systems is the development of economic opportunities that provide an alternative to commercial activities causing deforestation and the over-harvest of fisheries and wildlife stocks in the North Rupununi. Consequently, the NRDDDB has a vested interest in developing the Aquarium Fish Trade in the North Rupununi.

Fish are an Important Issue for Local Communities

The North Rupununi is coming under increasing threat from unmanaged commercial exploitation of wildlife and

The Amerindian Act Cap: 29:01

The Amerindian Act does not contain any provisions for the protection of wildlife or wildlife habitats. The act does however give Amerindian councils the power to make rules in certain matters and could be used to protect wildlife and wildlife habitats in Amerindian Villages, Districts, and Areas.

inland fisheries stocks. These increasing impacts mainly result from improved accessibility by road.

The North Rupununi communities rely mostly on fish as their main protein source and for financial survival in some villages. Currently, salted fish like Arapaima is illegally traded with Brazil. Some local villagers supply middlemen from Brazil and Guyana's coast with Arapaima that is then shipped to Brazil. Unfortunately, the communities have no jurisdiction over the major rivers and creeks, out of, or even running through Amerindian lands. Iwokrama faces a similar jurisdictional dilemma with waterways that border the Iwokrama Forest. Presently, there is also some confusion among National Agencies (Fisheries Department and EPA) over the responsibility to regulate and manage inland fisheries. The proposed Fisheries Act does not directly address inland fisheries but provision made under Part II Fisheries Management and Development, section 5 (Laws of Guyana; Chapter 31 Fisheries Legislation). However, limited human and financial resources within National Agencies to monitor the inaccessible areas has led to the development of mutually beneficial collaborative efforts with communities to mitigate negative impacts on fisheries resources and to promote sustainable livelihoods in the area.

Discussions among Stakeholders

Iwokrama has facilitated several stakeholder discussions since 1996. These discussions have involved local communities, government agencies and other NGOs. Discussions included two major workshops to identify critical issues for improved resource management in the area (1998), Participatory Human Resource Interaction Appraisals (1998-1999), and a North Rupununi Fisheries Workshop conducted in December 2000. All discussions reiterated the need for alternative sustainable livelihood opportunities for local communities and an effective management plan for river resources. The aquarium fish trade was mentioned as one possible alternative to provide sustainable income and help conserve resources in the Rupununi.

Iwokrama International Centre

Iwokrama is an International Organization with the following mission:

“to promote the conservation and the sustainable and equitable of tropical rainforests in a manner that will lead to lasting ecological, economical, and social benefits to the people of Guyana and the world in general by undertaking research and training and the development and dissemination of relevant technologies.”

One of Iwokrama's key goals is to ensure that forest resources are used sustainably and in accordance with participatory and democratic approaches to planning and implementation of resource management programmes.

A Fisheries Task Force was formed in December 2000 to investigate the aquarium fish trade potential in the North Rupununi. Key constraints to organization that were identified included the requirement for a support infrastructure (holding facilities, transportation, etc) and the absence of a satisfactory mechanism to establish prices and volumes to be exported from the North Rupununi.

More recently, the NRDDDB established a permanent executive fisheries committee and community fisheries committees in each village to work with national agencies and aquarium fish export businesses to develop a community-based ornamental fish collecting project.

Previous work carried out in Guyana included a December 2000 Fisheries Workshop. During this workshop, participants indicated the scope for expansion of the trade in ornamental fish (Watson, NRI Report no 2574). In addition, several high-value aquarium fish species were identified as abundant in the area including Silver Arowana (*Osteoglossum bichirrosum*), Motoro Sting Rays (*Potamotrygon motoro*), Banded Leporinus (*Leporinus fasciatus*), Corydoras sp., Tetra sp., Cichlids, and Catfish, etc. Watson (2000) suggested that the key for the NRDDDB would be to market low volume, high value, and high quality fish.

Economics of the Aquarium Fish Trade

In the main, Amerindians have lacked the necessary tools and training for living with new economic systems. Amerindians have lost traditional ways of life and populations have become more concentrated in smaller areas and become more sedentary. These changes have contributed to the local mismanagement of natural resources including the over harvest of wildlife, and the intensification of shifting cultivation. At the same time, transport costs have increased as government subsidies have been removed. Perhaps most important, agricultural products from Regions 8 and 9 cannot compete with products from areas in Guyana closer to the markets, or areas in the Caribbean with cheaper production costs.

Over the next five years, the NRDDDB will encourage the development of small businesses. These businesses will include local agricultural production of cassava products, vegetables, fruits, and livestock products. In addition, NRDDDB will focus on developing craft businesses including pottery, basketry, weaving, leatherwork, embroideries, and value added forest products such as furniture and housing fittings. Craft businesses will be linked to tourism and market opportunities that will open through visitors. Wildlife and fisheries products will continue to be important business bases in the North Rupununi; including Arapaima, Aquarium Fish, wildlife conservation and research, and song birds. Future livelihoods will ideally be based on high value, low volume, high quality niche marketed products.

The aquarium fish trade is a multi-million dollar industry. The annual worldwide export trade earns an estimated US \$186 million (US\$1.00-GY\$185.00), most of which is accumulated by developing nations from high volume markets. Much of the money is made from the retail trade including hardware, accessories, and fish food amounting to over US \$2 Billion.

The main South American exporters of aquarium fish are Brazil and Peru; Guyana has a relatively small trade in aquarium fish that may be worth US \$285,000.00 every year. (Taken from Watson 2000, NRI Report 2574)

With smart marketing ("green equity concept") Guyana can have much greater share of the economic pie.

Aquarium Fish represent a potentially important business for Iwokrama and the North Rupununi communities. Aquarium fish are high value, low volume, and potentially high quality products. Table 1 represents predicted cash flows for an aquarium fish trade business from Iwokrama/ the North Rupununi. These projections are based on exporting one shipment of fish worth approximately G \$ 1,000,000.00 (see Appendix 1 for detailed contents of shipment) in 2002, three shipments in 2003, and nine shipments every subsequent year. The costs of shipments include payments to harvesters, local transportation costs, and subsistence costs for harvesters, payment for the flight to Georgetown (which could be subsidized on the inbound flight), training, research, marketing and management costs, insurance costs, and interest payments on a loan. The project predict capital expenditures over the six years of G \$ 3,000,000.00 and annual payments to Fisheries Committees and the NRDDDB of 8% of the annual gross revenue. Sufficient cash balance would be available at the end of a year to continue funding shipments in the next year; we predict the need to support some early capital expenditures and training, research, and management costs from grants totaling G \$ 6,300,000.00.

At the end of the project, we foresee a business that would provide approximately G \$ 2,000,000.00 per year to fund the NRDDDB and Fisheries Committees; approximately G 5,900,000.00 in payments to local businesses or people; employ approximately ten people; and net approximately G \$ 300,000.00 per year that can be used for capital improvements. These cash flow predictions are based on nine shipments every year from the North Rupununi; if harvests from streams in the Iwokrama Forest were included, transportation costs may be increased, but the number of shipments would offset these extra costs and potentially provide employment for more people.

Ecology of the Aquarium Fish Trade

Fish stocks have very dynamic populations and densities vary between the dry and rainy seasons. As mentioned before, fish spawn during the high water period. When water levels drop fish are often trapped in drying ponds. In these ponds, fish become targets for predators or die because of the poor biophysical conditions; many fish in the Rupununi have responded to this strong selection pressure with adaptations to

locomote on land and survive anoxic and high temperature conditions. Most trapping for the Aquarium Fish trade occurs during the dry season before fish die in drying ponds. One of the major objectives of the plan to develop the Aquarium Fish Trade in the Rupununi is to understand the population dynamics of harvested species using both catch per unit effort and direct counts of fish as monitoring indicators of abundance. As part of the overall plan, a management plan will be required to monitor and control harvests because there have been documented cases of over harvest of species for the aquarium trade in places like South East Asia (see <http://www.science.nus.edu.sg>).

The Rupununi and Iwokrama Forest are particularly well suited to the Aquarium Fish Trade because of the high species richness of the area and the relative abundance of high value species.

Social Basis for the Project

Amerindians are presently the poorest members of Guyanese society. The percentage of the population considered below the poverty line (less than US \$529.00 a year) is 87.5% for Amerindians against a national average of 27.7%. In Regions 8 and 9, 94% of the population is considered below the poverty line. The North Rupununi communities have few community-based businesses and limited opportunities for employment. The aquarium fish pilot project is seen an alternative venture that can help with many social issues including poverty reduction and developing effective resource management systems. The project can create training and employment opportunities that will target mainly young people, especially women.

This pilot project is part of the DFID supported Iwokrama Sustainable Human Development Project. The project will specifically contribute to the Output "Systems and processes for sustainable rural livelihoods in forest areas developed and tested in communities in and around Iwokrama Forest."

Appendix 2 - Cash Flow for Aquarium Fish Business

	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>Total</i>
Beginning Cash Balance	0	\$1,654,900	\$1,246,835	\$2,051,250	\$1,792,042	\$1,044,873	
Cash Inflows:							
Aquarium Fish Sales	1,000,000	3,150,000	9,922,500	10,418,625	10,939,556	11,486,534	46,917,215
Bank Loan	1,000,000						1,000,000
Grants	2,700,000	1,800,000	1,800,000				6,300,000
Revenue from boat and engine		300,000	700,000	735,000	771,750	810,338	3,317,088
 Total Cash Inflows	\$4,700,000	\$5,250,000	\$12,422,500	\$11,153,625	\$11,711,306	\$12,296,872	\$57,534,303
Available Cash Balance	\$4,700,000	\$6,904,900	\$13,669,335	\$13,204,875	\$13,503,348	\$13,341,744	
Cash Outflows (Expenses):							
Harvesting salaries	140,000	441,000	1,389,150	1,458,608	1,531,538	1,608,115	6,568,410
Local transportation (boat, tractor, captain)	140,000	441,000	1,389,150	1,458,608	1,531,538	1,608,115	6,568,410
Food	50,000	157,500	496,125	520,931	546,978	574,327	2,345,861
Plane Flights	275,000	866,250	2,728,688	2,865,122	3,008,378	3,158,797	12,902,234
Training Costs	200,000	210,000	220,500	231,525	243,101	255,256	1,360,383
Management costs	800,000	840,000	882,000	926,100	972,405	1,021,025	5,441,530
Research and Monitoring		1,000,000	1,050,000	1,102,500	1,157,625	1,215,506	5,525,631
Insurance		100,000	105,000	110,250	115,763	121,551	552,563
Interest on loan	200,000	210,000	220,500				630,500
Marketing Costs	200,000	250,000	262,500	275,625	289,406	303,877	1,581,408
Miscellaneous	40,100.0	90,315.0	174,872.3	178,985.4	187,934.6	197,331.4	869,539
 Subtotal	\$2,045,100	\$4,606,065	\$8,918,485	\$9,128,253	\$9,584,666	\$10,063,899	\$44,346,469
Other Cash Out Flows:							
Boat and engine		500,000		500,000			1,000,000
Holding Station	1,000,000				1,000,000		2,000,000
Repaying Loan			1,000,000				1,000,000
Annual contribution to Fisheries Committees		276,000	849,800	892,290	936,905	983,750	3,938,744
Annual contribution to the NRDDB		276,000	849,800	892,290	936,905	983,750	3,938,744
 Subtotal	\$1,000,000	\$1,052,000	\$2,699,600	\$2,284,580	\$2,873,809	\$1,967,499	\$11,877,488
Total Cash Outflows	\$3,045,100	\$5,658,065	\$11,618,085	\$11,412,833	\$12,458,475	\$12,031,399	\$56,223,957
Ending Cash Balance	\$1,654,900	\$1,246,835	\$2,051,250	\$1,792,042	\$1,044,873	\$1,310,345	

Project Description

The Iwokrama Centre with the NRDDDB will implement this pilot project. Rodney Davis is contracted to act as the lead from the NRDDDB with the responsibility to ensure the proper design, implementation, and management of the aquarium fish trade pilot project. Christopher Chin is contracted as Iwokrama technical facilitator for the NRDDDB/ Iwokrama project. Eugene Isaac was contracted to assist with the development of the pilot project plan.

Goals

1. To cultivate a culturally appropriate mechanism that promotes sustainable community-based aquarium fisheries management programme, while managing the expectations, roles and responsibilities of stakeholders
2. To design and evaluate a model to demonstrate that aquarium fish can be used as a viable income-generating alternative for local communities while developing capacity to manage local businesses.
3. To demonstrate that local skills can be effectively adapted and utilized in the development and implementation of the aquarium fish trade management plan.
4. To continually assess the impact on the biological and social environment of the aquarium fish trade, and mitigate negative impacts through adaptive management
5. To lay the basis for the future development of an integrated fisheries management plan for the North Rupununi Wetlands

Objectives

1. Five-year project plan for developing the aquarium fish trade in the Iwokrama Forest and the North Rupununi by June 2002
 2. Secure market for 2002 and 2003 for four shipments of fish with exporters in Georgetown by July 2002
 3. Harvest and sell one shipment of aquarium fish by December 2002
 4. Design and build a holding station for aquarium fish in the Annai District by December 2002
 5. Create part-time employment opportunities in the aquarium fish trade for at least ten people by December 2003
 6. Build community capacity and awareness of the potential for the aquarium fish trade to contribute to development and conservation in the North Rupununi by December 2002
 7. Build marketing, research and management links with relevant stakeholders including Government agencies, NGOs and private sector by December 2002
 8. Develop a draft management plan for aquarium fish in the North Rupununi by December 2002
-

Activities

1. Fish Holding station and equipment - a holding station will be built close to the Annai Airstrip. Local contractors and local materials will be used to construct the holding facility. The facility will be situated to preserve cultural aesthetics and to maintain a natural air conditioning system. Special efforts will be made to collect leaves and wood materials that have been harvested in a sustainable manner.
2. Developing and defining the roles and responsibilities for partners in the project. This project involves several partners including the NRDDDB, Iwokrama, and the Wildlife Division, and the Fisheries Department. Defining the Roles and Responsibilities of these partners are as follows:
 - a. NRDDDB and Fisheries Committees
 - i. NRDDDB will have the responsibility for the project management.
 - ii. Implementation of the program will be through the Fisheries Committees
 - iii. Future collaborations will seek to build co-management structures with Government agencies
 - iv. NRDDDB will secure financial support for the development of future infrastructure
 - v. NRDDDB will also work toward the cultivation of an adaptable and sustainable program
 - vi. The NRDDDB will hire skilled persons from North Rupununi Communities to implement the project through a transparent screening process of applicants
 - b. Iwokrama
 - i. Iwokrama will facilitate the project and assist with funding for technical staff support and initial seed funding for program
 - ii. Iwokrama will assist the NRDDDB to foster linkages between NRDDDB and donor agencies and potential small grants
 - iii. Iwokrama will facilitate the general development and marketing of the fish in the USA and Europe
 - iv. Iwokrama could partner with the NRDDDB in the development of the aquarium fish trade within the Iwokrama Forest and the North Rupununi
3. Initial funding and future financial management
 - a. Iwokrama will provide seed funding for the pilot project and will not gain direct benefit from profit made from the trade unless Iwokrama enters into a business partnership with the NRDDDB to further develop the trade in the Iwokrama Forest streams.
 - b. Local participants directly associated with the project will be the immediate beneficiaries from the pilot project income and possible future developments
 - c. The NRDDDB through its Executive Fisheries Committee facilitated by Iwokrama International Centre (needs to examine contra 29.01) will manage all financial resources for the pilot project and possible future developments to ensure complete accountability and transparency

- d. The profit made by the pilot project will then be utilized for possible development of the aquarium fish trade through programmes such as monitoring and research projects that generate relevant information to improve fisheries management
- 4. The project will develop protocols for dealing with exporters that include contractual arrangements and fair and equitable sharing of the benefits
- 5. The project will develop programmes in several areas including:
 - a. Training
 - i. we are seeking to acquire the assistance of Brazilian NGOs (Projeto Piaba), NRI and other established international and local contacts for training in areas including: collecting, handling methods; holding station management; management of data (computer skills etc.); occupational health & safety.
 - ii. Summer programs and Internship opportunities at the Holding Station as a way of increasing the participation of youths, especially young ladies that might interested, therefore establishing some form of gender balance and equity.
 - iii. Project management skills and tools including financial management training
 - iv. Exchange visits to established freshwater aquarium institutions
 - b. Education and outreach
 - i. This is an important ingredient for the success and future development of the project. Dissemination of information throughout the project will serve to keep stakeholders involved and abreast of developments so that they may be able to contribute to project development. The education and outreach programme will focus on managing expectations and explaining the realities of the project. Education and awareness programmes will focus on:
 - 1. helping people understand the aquarium fish business and using the business as an example for the development of other businesses
 - 2. Awareness and appreciation building for the value of the North Rupununi fish through aquarium specimen exhibition and displays at the local, national and international level; distribution of pamphlets and posters; fish catalogs; work in partnership with CEW, MRU, and Wildlife clubs to record traditional stories
 - c. Harvest management
 - i. Although this is primarily for the development of a fisheries management plan, it is also important for the pilot project to begin the process of establishing the following:
 - 1. Standard collecting sites
 - 2. Standard collecting methods (which can lead to employing catch per unit effort as a monitoring mechanism)
 - 3. Quotas and pond allocations for harvesting
 - 4. Licensing for harvesters, and in the longer term licensing for NRDDDB to export fish from Guyana

5. Certification and green labeling for the aquarium fish trade

d. Research

- i. Identifying priority species for study
- ii. Examining species distribution and relative abundance in relation to habitats
- iii. Understanding the breeding biology and migratory habits of aquarium fish
- iv. Developing methods to monitor social and biological impacts of the trade including assessment of benefits and disadvantages
- v. Marketing research to develop new markets in the USA and Europe
 1. The marketing strategy will also involve education and outreach. It will be an educating process for persons involved in the trade to learn about issues that affect the aquarium fish supply and demand. Equally, it will also be a challenge to produce information that will be palatable to the consumer market. Areas for marketing strategies development include:
 - a. Examining the role of certification as a marketing mechanism
 - b. Develop logo, catch phrase, holding station name and other marketing tools
 - c. Advertisements on the internet (through Iwokrama website)
 - d. Exhibits at Guy-Expo, Ministry of Foreign Affairs street fair and other Guyana exhibitions

e. Funding and grant writing

- i. The project will need a sufficient financial base to support each of the program areas and will require the funding sources for market development and research. The NRDDDB together with Iwokrama will collaborate to secure future funding through grant writing and effective financial management of revenues

f. Establishing links with major stakeholders (see appendix for project stakeholders)

- i. The challenge will be to foster lasting partnerships between the major stakeholders. It is extremely important for the NRDDDB to work with relevant Government regulatory agencies, especially since they are the policy and ultimate decision makers. Numerous shared advantages can result from areas of work that will include:
 1. Aid with management development of inland fisheries
 2. Regulations for monitoring
 3. Protocols for conflict resolution between community and outsiders for natural resources
 4. Exclusive ownership rights to ponds leading to custodianship for river resources
 5. Possible move to certification processes

6. Mechanisms for national management of the aquarium fish and wildlife trades through concessions and community-private sector partnerships

Time Line

The pilot project commences in January 2002 and continues to the end of December 2002. (see appendix)

Project Monitoring and Evaluation

1. Produced the five year project plan for Aquarium Fish
2. Built a holding station for aquarium fish in the Annai District by December 2002
3. Secured market for 2002 and 2003 for four shipments of fish with exporters in Georgetown by July 2002. Harvested and sold one shipment of aquarium fish by December 2002
4. Built community capacity and awareness of the potential for the aquarium fish trade to contribute to development and conservation in the North Rupununi by December 2002
5. At least ten people employed from communities in the aquarium fish trade for at least by December 2003
6. Built marketing, research and management links with relevant stakeholders including Government agencies, NGOs and private sector by December 2002
7. Developed a draft management plan for aquarium fish in the North Rupununi by December 2002

Community Involvement

We developed criteria to select four communities to be involved in the pilot stage of this project. The criteria used to select the communities included:

- Proximity to potential harvesting spots - villages that are located in proximity to harvest grounds and have healthy populations of species of interest. Having the accessibility advantage will make such communities a more reliable source for delivery of fish. This would mean that the fish quality will be higher since the fish will experience less stress when in transit from the collecting site to the holding facility.
- Local capacity – we will work with communities that already have some experience working with aquarium fish.
- Limited alternative income generating projects – we will work with communities that have no current commercial projects.

Based on these criteria we propose to initially involve four communities - Massara, Yakarinta, Aranaputa, and Crash Water. While the pilot project will focus on these four communities, the project includes outreach to other communities to help them understand the complexity of the trade before committing themselves to the idea.