Summary Report

Interpretation and Ecotourism Evaluation
Refugio de Vida Silvestre Bocas del Polochic, Guatemala

April 24 to May 8, 2004

Conducted by
U.S. Department of the Interior
International Technical Assistance Program

Sponsored by
U.S. Agency for International Development

Written by
Bonnie Lippitt
Oregon State Office
Bureau of Land Management
Department of the Interior

Michael Williams
Anasazi Heritage Center
Bureau of Land Management
Department of the Interior

Contact for more information
Cynthia Perera, International Program Manager
International Technical Assistance Program, U.S. Department of the Interior
Phone 202 219 0537, Cynthia_Perera ios.doi.gov

TABLE OF CONTENTS

Report on the
Interpretation and Ecotourism Evaluation
Of the Bocas del Polochic Wildlife Refuge, Guatemala

EXECUTIVE SUMMARY

The United State Department of the Interior, International Technical Assistance Program (DOI-ITAP) in conjunction with the United States Agency for International Development Guatemala (USAID/Guatemala) sponsored an evaluation of the interpretation and ecotourism opportunities for the Bocas del Polochic Wildife Refuge (Refugio de Vida Silvestre Bocas del Polochic or RVSBP). The evaluation team consisted of Bonnie Lippitt (DOI-BLM) and Michael Williams (DOI-BLM). The team was joined by several employees of Defensores de la Naturaleza (FDN), the nongovernmental organization responsible for management of the refuge, including Herberth Reiche, Heidi Garcia de la Vega, Aroldo Choc Ramos, Arnoldo Caal, Santiago Pana, and Alfonso Perez. Monica Paulson, a Peace Corps volunteer assigned to work with the Refuge for the next two years, also participated in the evaluation. The primary objective of the team was to assess the current infrastructure, services, and interpretation available in the refuge and offer recommendations on ways to improve and or expand on these with the goal of strengthening the role and contributions of ecotourism in the refuge and adjacent communities.

The evaluation team was based out of the Scientific Research Station at Selempin located just outside the refuge on its southern boundary and adjacent to the small Kekchi community of Semuy. The station is the destination for ecotourists wishing to overnight in the tropical forest and seeking a more in-depth encounter with the flora and fauna of the refuge. Over the course of ten days, the team evaluated current and potential interpretive trails focusing on the refuge's wetlands, forests, caves, and people. In addition, the team reviewed existing informational and interpretive materials, existing capacity for guide services, and current visitation patterns. Daily discussions with the extended team helped elicit statements of significance for the refuge as well as more complete themes for the development of an interpretive plan. Additional discussions helped brainstorm ideas for attracting new ecotourism markets to the station, sharing efforts and resources between various FDN sites, and expanding the role of the indigenous communities in the delivery of programs and services.

The team gained a good understanding of both the opportunities and challenges facing the FDN in managing the refuge. The existing infrastructure at Selempin and the presence of an interested, dedicated, and skilled core staff combine to provide a strong based from which to develop a more comprehensive program. Significant challenges include difficulties in accessing the site due to its remoteness and limited transportation options, lodging services provided at the more basic end of the ecotourism spectrum, and the overarching concern for visitor safety and security throughout Guatemala.

Key recommendations centered on simple ways to upgrade the lodging experience at Selempin, suggestions for developing more all-inclusive packaged tours of the refuge to attract a new market of ecotourists, and refining key interpretive themes to serve as the foundation for upgrading existing and developing new materials. A detailed listing of specific recommendations presented by the DOI team is included later in this document.

EVALUATION TEAM ACTIVITIES SUMMARY

The evaluation team arrived in Guatemala City late Saturday evening April 24, 2004. This allowed time on Sunday, April 25 for the team to meet and share information and resource materials with the two-person team on concurrent assignment to Sierra de las Minas.

Monday, April 26, began with a breakfast meeting with Igor de la Roca and Herberth Reiche to review the Bocas del Polochic assignment, followed by a second meeting at the FDN office to meet FDN headquarters staff and review the schedule for the Sierra de Las Minas assignment. The team then departed the city enroute to the Scientific Station at Selempin, arriving around 8:00pm.

On April 27-28, the team explored the routes to and the interiors of two caves located near the station. One of the caves only recently discovered, has not been named, and has not been visited by tourists. The other, Cueva La Armadilla, is much larger and requires the use of ropes to descend into the cave.

On April 29, the team evaluated the Aquatic Trail along the Rio Selempin from the community dock downriver approximately 1,500 meters. In the afternoon, interviews were conducted with three of the four resource guards to obtain their opinions on what was working in the program and their ideas for improvements and unmet needs.

The focus for April 30 was an exploration and review of the station s terrestrial trails. The morning hike traveled along the 3 kilometer Cultural Trail and the afternoon consisted of a short walk along the Cotuza Trail that loops .6 kilometers from the station through the surrounding forest and back.

On May 1-2, the team took to the water to explore and review the refuge's other aquatic trails, with an overnight stay in El Estor, the seat of the local municipality. Sites visited included Rio Oscuro, the Lake Izabal portion of the refuge, two channels of Rio Polochic, Laguneta Teodoro, and Rio Zarquito. While in El Estor the team visited three of the four hotels in town and met briefly with the owners. The trip to town also provided an opportunity to visit the FDN refuge office and view the orientation sign at the dock.

May 3 was devoted to helping clean the station in the morning and discussing the condition, infrastructure and operation of the station itself. This was followed by a visit to the community s fabric workshop and handicraft store. The final interview with the fourth resource guard was also completed. In the late afternoon, the team shared many of its preliminary ideas and suggestions with the extended group to obtain feedback and additional input.

On May 4, the team had an opportunity to participate in an in-depth tour of the African Palm plantation and palm oil factory adjacent to the refuge with the intent of evaluating its potential as another attraction for visitors to the station. Plantation managers have allowed FDN to establish a biological corridor linking the Polochic wetlands with the upland Sierra de las Minas protected area.

May 5, the last full day at Selempin, the team spent time preparing the draft report, working on the draft Comprehensive Interpretive Plan, integrating ideas, and conducting closeout sessions with the refuge staff.

On May 6, the team returned to Guatemala City. A presentation on the results of the evaluation took place back at the USAID office on Friday morning, May 7 and the team returned home on Saturday, May 8.

ACKNOWLEDGEMENTS

The team would like to extend our appreciation and thanks to Herberth Reich, Heidi Garcia de la Vega and Monica Paulson for all the time, energy, professional camaraderie, logistical support, and significant contributions the made during the discussions that led to this report. Their help and friendship was invaluable.

We would also like to thank Alfonso Perez, Aroldo Choc Ramos, Arnoldo Caal, and Santiago Pana for serving as our guides, sharing their ideas, helping us to better understand the unique resources of the RVSBP, keeping the Selempin Station in good condition, catching us fish for dinner, and always being in good spirits, in spite of two weeks spent away from families and friends.

LISTING OF RECOMMENDATIONS

1. Recommendations for specific trails.

One of the primary purposes of the visit was to evaluate the condition and current interpretation on three existing trails, and several more potential trails.

Cave #1-Unnamed

Refer to Section #7 (Notes) of this report for a more detailed description of this cave.

Recommendations:

- An archeologist should visit this cave as soon as possible to assess the nature and age of the bones and pottery shards, and to give recommendations on future actions.
- No further disturbance of the bones or shards by staff or visitors should occur.
- The cave is too narrow and small to put a staircase inside or to provide the kind of experience that will keep visitors on site extra days.
- **Do not open the cave or trail to visitors until the results of the archeological assessment has been completed.**

Cave #2-La Armadilla

Refer to Section #7 (Notes) of this report for a more detailed description of this cave.

- The cave has some interesting and delicate features but many are located directly in or along the path of travel and will be destroyed by repeated use.
- Exploring the cave is not a safe undertaking for most visitors and especially not for younger school groups. Cave conditions require more specialized caving experience and equipment such as helmets, headlamps, and ropes to enter safely.
- The cave is too narrow in most locations to install a staircase. Access requires a rope-assisted descent at a 60 degree angle through a narrow passage. Altering the cave entrance or interior to accommodate a safer passage will destroy the very resources the cave offers.
- Providing guide service to the caves requires a higher level of guides to insure safety (a minimum of 3 guides).
- Providing guided cave hikes requires the purchase and maintenance of climbing helmets, caving lamps, gloves, ropes, etc.
- The are 20-30 patches of fungus in the cave and it has not been determined whether these pose a breathing hazard to cave visitors.
- The existing trail to the cave is not safe for visitors and should not be used by them.
- Current visitor use of the cave puts FDN at a higher risk for visitor injuries, accidents, and the resulting claims.

Recommendations:

- **Do not open the cave to visitors.**
- If the cave is not opened for visitors, there is no need to construct a new trail.
- If in spite of these recommendations, there is continued interest in exploring the option of opening the cave, a thorough consultation with a cave biologist is strongly recommended to determine the appropriate action.

The Aquatic Trail

- **This trail is one of the highest priorities for the Selempin Station to maintain, interpret, and encourage visitors to travel. It is the heart of the RVSBP experience!**
- The existing trail is a comfortable length, both for guided and self-guided use.
- The current self-guiding brochure does not function well for the guides or visitors. It is based on fixed stops which are hard to locate. In addition, the species and attractions highlighted at each stop are seldom seen in those locations. Conditions change constantly.

Recommendations:

- Once the new Comprehensive Interpretive Plan (see Section #2-Interpretive Program) is completed, develop a new self-guiding brochure using identified themes and greater emphasis on the overall wetland environment. Accompany this guide with a more comprehensive set of identification guides to the commonly viewed plants, animals, fish, birds, etc. This new guide should not be based on fixed stops, rather it should be provide maximum flexibility.

- Guided trips need to rely much more heavily on personal information provided by the guides themselves. The guides are already knowledgeable about the local flora and fauna, but they require more training on the techniques of personal interpretation.
- The two permanent signs should be updated (see Section #2-Interpretive Program).
- Always provide lifejackets for all passengers when conducting this tour and when renting kayaks or canoes to visitors.

Cotuza Trail

- The trail is in good condition and is a pleasant walk.
- The current self-guiding brochure may work for school groups up to high school age but is far too simple and narrowly focused to be of much interest to other visitors.
- The trail is short enough that it does not seem necessary for a personal guide to accompany hikers.

Recommendations:

- Make this trail a truly self-guided trail for non-student visitors.
- Once the new Comprehensive Interpretive Plan (see Section #2-nterpretive Program) is completed, develop a new self-guiding brochure using identified themes and greater emphasis on the botany of the Very Humid Subtropical Forest. Consider installing some botanical labels along the trail as well.

The Cultural Trail

- **If the Aquatic Trail is the heart of the RVSBP, the Cultural Trail is its soul! It provides a meaningful introduction to the Kekchi people who make this place their home and depend on the forest's resources.**
- The trail is steep in some places but generally in good condition. The exception is where it crosses a recently deforested area near the highest point on the trail. The trail needs to be rerouted around this section. Visitors should not be walking across felled trees and slash.
- The current self-guiding brochure works better for the guides than the others noted above because the stops are locat4ed at more permanent features. It likely works well for school groups up to high school age but is written at too elementary a level for most other visitors.

Recommendations:

- Once the new Comprehensive Interpretive Plan (see Section #2-Interpretive Program) is completed, develop a new self-guiding brochure using identified themes and greater emphasis on the complete story of how the Kekchi people use the forest for subsistence. The brochure should also address the role of village residents in the harvest of the African Oil Palm Plantation and more about the daily life in the village.
- Guided trips need to rely much more heavily on personal information provided by the guides themselves. This will require more guide training.
- Consider constructing a small shade shelter at one of the two highest viewpoints along the trail. This could also be designed to provide for temporary corn storage, making it more useful to the village and less likely to be vandalized.

Rio Zarquito Boat/Float Trip

For a change of pace and a trip more focused on sport than interpretation, the FDN staff should consider offering a kayak, raft, or even inner tube float trip down the Rio Zarquito from the bridge across the road down to the mouth, a float of about 1-1.5 hours without stops. Visitors and boats could be dropped off via car and then picked up where the Rio Zarquito enters the Rio Oscuro by launch. The trip should be accompanied by staff or a guide from the community, more for the purpose of safety than to provide interpretation. Visitors would be encouraged to relax, swim, eat a picnic lunch, and enjoy the river environment. The temperature of the Rio Zarquito is much cooler than adjacent rivers and lagoons, providing a welcome respite from the usually hot climate.

2. Recommendations for improvement and expansion of interpretive programs and materials.

Plans for ecotourism development and promotion in the RVSBP should begin with a clear interpretive vision in order to maximize chances for successful implementation. To do otherwise is to "put the cart before the horse." In addition to the items listed above for specific trails, the following recommendations pertain to the overall Interpretive Program for the RVSBP.

- **Completing a Comprehensive Interpretive Plan is a high priority for the Refuge**. While the student thesis completed by Lucrecia Weissenburg in 1999 provides good background information, it does not contain key requirements now accepted the professional standard. The team shared reference materials and sample plans with the format and content now used by the U.S. National Park Service with refuge staff. A draft outline and plan was initiated. The team has agreed to work with staff at a distance via computer to review the plan as it is developed.

- Small information and interpretive stations should be developed both in the main lodge at the station and at the refuge office in El Estor. These centers should contain library books, photo files of commonly seen plants and animals, skeletons, pelts (if practical), information about other protected areas managed by FDN and across Guatemala, etc. The center at El Estor could also feature a television monitor and video player along with a collection of pertinent videos.

- The RVSBP should experiment with more flexible and attractive options for permanent signing. While in decent condition, the current routed wooden signs are all dated in content and are difficult to replace if vandalized or stolen. The painted metal signs are also dated and showing signs of corrosion. The time and cost to reproduce such wood or metal signs is about equal to that of their original fabrication. To create more easily-replaced signs with a greater degree of design freedom, staff may want to first experiment with signs designed and printed using FDN computers, programs, and plotters, then laminated on both sides with durable plastic sheets. A more durable option is to fix the digital output to a wood or metal backing and then use multiple layers of marine varnish to waterproof the signs.

These signs would be easy and inexpensive to update and replace. If the signs are well-received, RVSBP staff may want to consider upgrading to digitally produced signs embedded in high-pressure resin laminate, a highly durable product available from companies such as Folia, et al.

- As noted in Other Potential Trails in Section #1, the RVSBP Interpretive Program could be expanded to include day trips conducted out of El Estor either by FDN guides or by launch operators trained and authorized by FDN for a small fee or percentage.

3. Recommendations for improvement and expansion of ecotourism opportunities.

Another assignment for the team was to evaluate the existing and potential opportunities for improving and expanding the RVSBP Ecotourism Program, with the goals of increasing the overall number of paying guests to the station, thereby increasing revenues for the operation of the station and for services provided by the communities.

- **Change the measure of success from the length of stay to the number of nights at full pay**. In the short-term, complement-and in the long-term, change- current emphasis on extending the length of stay for lower paying visitors to one of expanding the overall number of higher paying visitors. By doing this and implementing the suggestions in this report, the RVSBP is more likely to meet it s Master Plan II goal of a realizing a 10% increase in visitation per year over the next 5 years and making progress to the goal of increased support for the Selempin operations.

- **Develop and test the concept of more expensive, all-inclusive 1-, 2-,| 3-, and 4-day package tours from El Estor, Mariscos, and other locations along Lake Izabal.** We propose that such packages include all water transportation, lodging, meals, and guides tours during the visit. Package fees would be paid in full in advance at the FDN office in El Estor or in Guatemala City, with a proportion of the fees distributed by FDN to appropriate individuals (such as guides) or to local community development funds. This may also require working more closely with some in-country tour operators (such as Tropical Tours) while at the same time ensuring the use of local services.

- **Develop and implement a Marketing Plan for RVSBP.** Take immediate steps to expand the targeted ecotourism market beyond the current audience, which largely consists of Guatemalan student groups and backpackers from mainly European countries such as Germany, England, France, and Spain. The goal is to attract a higher-end tourist market. Seek contacts to arrange corporate retreats by companies based in Guatemala City and elsewhere. Other potential niche sectors within this new target audience include international conservation organizations such as The Nature Conservancy, the Audubon Society, the American Museum of Natural

History, etc. Consider arranging participation by such organizations through "service trips" involving on-site conservation projects such as bird counts, botanical surveys, etc. Also consider opportunities for putting the refuge "on the map" by coordinating trips to the refuge as a pre- or post-fild trip as part of a national, Central American, or International Birding Conference if one is held within reasonable travel time/distance.

- The marketing plan should include: articles in key conservation magazines, contact with television stations that feature conservation programming, familiarization trips for tour operators and agents, redevelopment and wider circulation of existing RVSBP promotional materials, improvements to the RVSBP website in both content and reciprocal links (e.g. Birding.Com), community presentations and ecotourism council development in El Estor, membership in InGuat or other ecotourism marketing organizations such as Green Leaf and the development of FDN-RVSBP products for sale to visitors. Possible sales items include a video of RVSBP-Sierra de las Minas, a map and guide of both (similar to the Ak Tenamit example), postcards of the refuge, note cards made of handmade paper and decorated with pictures of area features drawn by community school children, RVSBP collector pins, and FDN and/or RVSBP patches, decals, bandanas, etc.

- Depending on the growth of the above market, gradually reduce-or even phase out-current *a la carte* options for backpackers, such as tent camping and rental of the kitchen facilities. If maintained, move use of kitchen services to the outdoor kitchen to maintain the cleanliness of the indoor kitchen and reserve it s use for food preparation for paying customers.

- Providing high quality guide service is seen as the most critical component in attracting and expanding the new target market. **Increasing guiding capacity, both in the number of guides available and the quality of their skills is a high priority for the RVSBP.** There is a need to institute in-depth guide training. This could be done in conjunction with some form of certification (such as that offered by the National Association of Interpretation), but should certification is an option that should be examined closely before instituting.

4. Recommendations for the management and enhancement of the operations at the Selempin Scientific Station.

The following recommendations help strengthen the operations at the station consistent with the other recommendations contained in this report.

Background

Current site infrastructure consists of a main lodge with dining room, indoor kitchen, pantry, hammock room, and office downstairs and dormitory housing with bunk beds for 14 men and 14 women upstairs, a cabin with two private rooms each containing beds for 2-4 visitors, a communal bathroom with 8 sinks, 3 toilets and two showers each for men and

women plus 3 urinals, an outdoor kitchen, and a research cabin with work tables, a sink, storage space, and a room that can sleep 4-8 people. Electricity is provided by a solar system, water is piped directly to the site from a catchment upstream on the Rio Selempin, and black water from the bathrooms is run through a septic system.

Existing budget projections indicate breakeven levels of visitation at 291 fully paying customers per month and 3,630 per year, and average of 10 visitor per night year round. Current visitation is approximately 290-300 visitors per year. Of these, less than half pay full costs. Most visitors come in the form of large school groups that stay for a discounted price.

Observations

- Current demand for beds rarely exceeds capacity, except when a large school group visits. However, demand for private rooms is currently limited to two options in the cabin.
- The research cabin does not have electricity, the floor is rotting, and the space is underutilized by researchers or others.
- The combination of indoor and outdoor kitchens, as well as the number of cooks available from the community, is adequate to meet current and future demands. Food supply, both in quantity and variety, is the limiting factor.
- The solar system is barely adequate to meet current demand and often dips below normal on cloudy days, requiring limiting the use of lights.
- The water supply is adequate to meet current and future demands.
- The septic system is adequate to meet current demand but staff are concerned that it will not handle 3,630 visitor per year.
- The main lodge roof has been in place three years and is expected to last five. The plantation provided the palm fronds for the thatching. The roof appears adequate to keep the building dry.
- All of the buildings are screened and mosquito nets are provided as part of the bedding. However, the main lodge still experiences problems with mosquitos, especially in the evening hours.
- Having an open lawn area between the buildings is a nice feature and provides a gathering place for student groups to meet and participate in games and other environmental education activities.

Short-term Recommendations

- Establish a more realistic visitor capacity model for the station, taking into account the overall physical infrastructure along with programmatic issues such as the make up and mixing of groups, guiding capacity, and food supply. Adjust pricing, budget projections, etc. based on this capacity to better approach a self-sustaining operation.
- Expand the capacity of the solar system. Provide electricity to the research cabin and enhance overall electrical supply. Identify a backup system for use in emergencies including flashlights and perhaps a small generator.
- Consult with a sanitary engineer to determine the true capacity of the septic system and to determine if it requires solids to be pumped and on what schedule.

- Continue to improve the bathroom. Replace the existing natural screening material with another that is more durable. Replace the metal screening in the showers with plastic or some other material. Reconfigure the shower stalls to add room for a changing area. When large groups are present, clean the bathroom more frequently.
- In the main lodge, add additional mosquito screening between the downstairs rooms and the upstairs dormitory. Consider the use of citronella coils on particularly bad days.
- Establish a more frequent replacement schedule for mattresses and pillows.
- Improve the aesthetics in the main lodge. Use locally woven cloths for placemats and decoration. Add local art work to the walls. Unless there are large school groups, organize the furniture to allow for both communal and private dining as well as a more formal sitting area. Develop furniture placement diagrams to assist staff. Add more hammocks or hanging chairs to accommodate more visitors.
- Develop a site maintenance manual with information on all equipment specifications, required maintenance, repair information, and replacement schedules for all site infrastructure.
- Improve privacy of individual cabins with the addition of curtains or a change in the location of the screening.
- Continue to stress the importance of keeping the kitchen area clean and sanitary at all times.
- Improve the site first aid kit.
- Develop a site emergency plan to address medical, security, and other emergencies. Improve site communications through the purchase of radios to complement the existing supply of one permanent cell phone and one temporary cell phone that arrives with the resource guards.
- Enlarge and post station rules for Minimum Impact Ecotourism in a more visible location downstairs in the main lodge as well as in the private cabins. Translate to English, French and German and have available for non-Spanish speaking visitors.
- Post photos and names of the station staff for ease of identification. Include the village cooks and guides.
- Develop and post a brief acknowledgment of the contributions made by the plantation on behalf of the station in the main lodge.
- Develop a small display of the village handicrafts to increase visitor awareness of products available for sale.
- Develop a notebook that contains information and pictures on recent village projects such as the new dock, the community launch, the handicrafts project, the weaving project, etc. Use this as a coffee table book in the formal seating area.
- As noted in the section on interpretive program improvements, convert the office in the downstairs portion of the main lodge into a small interpretive center and library.
- Establish visiting hours for village children so that they do not skip school or outstay their welcome. The same idea can apply to guests who want to visit the village.
- Update budget projections to reflect costs associated with lawn maintenance, boat repair and fuel, safety equipment, purchase of new bedding, etc.
- Consider the addition of some native species plantings around the cabins and main lodges to attract smaller birds and butterflies.

- While it is feasible to access the station by private road, at least during part of the year, the arrival by boat from El Estor is much more scenic and evocative of the RVSBP experience. Encourage the development of packages that emphasize this approach over approach by land through the African Oil Palm Plantation.

Long-term Recommendations

- As the type of visitor changes, consider moving backpacker use for those not buying meals to the outdoor kitchen. This will maintain the indoor kitchen for fully paying visitors and will improve cleanliness and hygiene.
- Research different options for the roof that may extend it's life while still maintaining the rustic appearance and use of native materials.
- As demand increases, consider remodeling the research cabin to provide additional private lodging. Wall off the sleeping area from the lab and storage space and install a second door. Consider extending the raised boardwalk from the research cabin to the bathroom.
- Any additional structures added to the site should be in the form of private cabins for couples and family groups.
- Work with the plantation to explore the feasibility of using the old landing strip for emergency use (such as medical evacuation) and potential future use for tourist flights from Guatemala City.

5. Recommendations for future training courses.

The following training needs were identified by the team during the evaluation of the above programs and based on discussions with refuge staff. Participants could include refuge staff, community members, and/or business operators in El Estor and Mariscos, depending on the course.

- Basic and Intermediate Guide Training, perhaps with some form of certification
- Basic Customer Service and Host Training, perhaps with some form of certification
- Basic First Aid Skills
- Basic Law Enforcement and Personal Safety Training
- Continued Refresher Training on Sanitation, Hygiene, Food Preparation, etc.
- Sensitivity Training on Cave Environments, Resources, and Protection
- Spanish Language Skills
- English Language Skills

6. Miscellaneous ideas, recommendations, and suggestions.

Some of these items have been touched upon in other areas of this report but they are repeated here for increased emphasis.

- Consider obtaining, ideally through donation, plastic kayaks or canoes for visitors to use to paddle the Aquatic Trail. These could be kept by FDN and rented to visitors

on behalf of the community, allowing the community to retain the use of their own boats for subsistence purposes. Staff have also indicated that the supply of large trees for making canoes is dwindling and this would help conserve the supply for local use.

- Upgrade the first aid supplies at the station and develop portable first aid kits for guides to carry when conducting guided walks.
- Insure that lifejackets are always available for all passengers aboard launches, canoes, and kayaks.
- Consider an FDN uniform component for resource guards and guides in addition to the CONAP vests, such as a hat, or patch on the CONAP vest, etc.
- Work with the Universidad del San Carlos and/or the Universidad del Valle de Guatemala to develop an internship or practical in conjunction with the station, perhaps focused on guiding and guide training.
- Explore the possibility with the community of Semuy I of training older school children to assist as guides and/or to conduct programs as part of their school curriculum.
- Translate all key materials into English, French, and German.
- Develop and implement a Limits of Acceptable Change (LAC) process for the station to monitor and manage potential impacts to the site, the areas resources, and the community.
- Explore the possibility of establishing a Sister Refuge Program with a U.S. Wildlife Refuge.
- Use the Semana Santa/Easter Week peak visitation as a time to more effectively market the refuge and the station to a domestic Guatemalan market.

7. Notes

The following provides additional background information on some selected aspects of the resources and operations at the station and RVSBP.

Unnamed Cave

This smaller cave is accessed by a short .75 kilometer trail from the station. The path leads through the African Palm plantation then makes a short but steep climb about 35-50 meters up a slope to the cave entrance. The slope and cave are in a limestone formation.

The overall cave is about 50 meters in length, mostly in the shape of a V, with a 20 meter descent, a flat area, and then a climb back up. The cave contains some minor formations…flowstone and a few short stalagtites. In this season the cave appeared dry with no signs of dripping but that might change during the rainy season.

There are bats in the cave….on one ceiling shelf there are about 30 and another with 20. We did see a large insect and there was some debate whether or not it was spider or something else. It appear to be about 5 centimeters across with legs of about 15 centimeters each. The guides said this insect delivers a very painful bite.

The key feature of the cave is the presence of some bones and pottery shards in a few different locations. It is unclear if the bones are human or animal, or both. We believe that some are human and very old. Most appear to be long bones such as femurs but there is a portion of a mandible (jaw bone). The mandible and some of the long bones appear to be cemented in calcite to the stone where it rests. It is missing several teeth but still contains 4 molars plus an incisor. The bones are scattered and there are no complete skeletons. The bones appear clean and solid. The shards consist of about 40 pieces, a few the size of a hand but most much smaller. They are thick-walled, about 1 cm, reddish, with black carbon staining, unglazed, and with no decoration. Age is unclear. The bones and/or shards are found in about 4 locations.

Some of the bones and shards have been moved. There is little sensitivity related to cave resources. This is a training need. The bones and shards need to be assessed by an archeologist. If they are very old, the cave may need additional protections.

Our impression was that the cave should not be developed for visits until the issue of the bones and shards is known. Even then, the steep entrance to the cave, the steep descent into the cave, its small size, and lack of many formations makes it of minor interest to those who are serious cavers and not of high value versus the risk for casual travelers. It does not merit and would not fit an interior stairway. Such an undertaking is too expensive for the return it would provide.

Armadillo Cave

The distance to cave is about 1.75 kilometers total, and takes about 40 minutes to walk. The trail is narrow and steep. There is a steep rough climb to the cave entrance, a vertical elevation gain of about 130 meters. There are not many good places to gather a group. One possibility is at the crest where there is the potential for some good views.

The cave entrance is about 1-1.5 meters wide. It immediately leads to a descent at a 60 degree angle. The descent is about 35 meters. At the entrance are some delicate formations, such as soda straws. There are about 4 different levels in the cave but never really a grand room. We only saw 2-3 bats during the visit. Long roots reach from the surface into the cave.

Most of the formations in the cave are fairly intact but it wouldn't take long to impact those along the route and possibly others. Formations include soda straws (from 1-3 inches) curtains, fins, stalagtites, a few stalagmites, and a column about 30 centimeters thick that is connected top to bottom. There is a lot of condensation and some dripping from the soda straws. There are a few large spiders like we saw in the first cave.

There are patches of fungus with 4 inch high delicate hair, one patch about .3 meters squared. There appears to be about 20-30 of them, most of smaller sizes.

There are pockets of highly polished river stones and pebbles, half inch in size, plus three types of snail shells. In one place the shells and pebbles are mixed, otherwise there are

small pockets here and there. The pockets are out of character with the cave.....it doesn't appear that they have been washed in but it was not clear.

The cave is about 35 meters deep (max) about 100 meters to explore. The widest part is only about 2 meters, except for room at top which is slightly larger. It has a low ceiling. Exploration includes mostly crawling and squatting with a few places to stand. A group of more than 6 would be difficult to manage. Even 6 is a stretch. There is no place that an entire group could gather.

African Oil Palm Plantation

The trees in this plantation are African Palms. They are not native. They are cultivated for the oil they produce. The oil is used for commercial purposes, such as cooking oil for deep-fat fryers and packaged food additives. The market appears to be both domestic and international.

The trees can produce a commercial harvest in the third season and produce for about 20-25 years. This plantation was only recently planted in palms. The oldest trees are 7 years, and there are also plantings of 5- and 3- year old trees. It is the third largest African Palm plantation in Guatemala.

The plantation complex also includes a tree nursery and a factory where the palm fruit is rendered into oil for shipment to other refineries for final processing. The plantation employs about 800-900 workers from the local communities during the peak season and operates year round.

The refuge has a good relationship with the plantation owner. In fact, FDN has a 30-year concession for the land on which the Station is located. The owner has agreed to allow the reforestation of a corridor through the plantation to enhance connections between the Bocas Del Polochic and Sierra de las Minas protected areas and from the river to the Station.

Service Trips

Some organizations desire to conduct trips that not only visit protected areas but help complete projects that benefit the area during these visits. Just like other tourists, participants pay their own way. However, they are available for all or a portion of their trip to complete volunteer projects of a suitable nature. Participants in these types of trips are often well-educated and well-traveled. They are looking for a more in-depth experience and a way to connect on a deeper level with the sites and people they visit. As an additional incentive, U.S. citizens that participate in such trips often receive income tax deductions for a portion of their costs. The team believes these types of trips might be a good match for the RVSBP and, as noted in the section on Ecotourism Opportunities, should be explored by staff.

8. Sources provided to FDN staff.

The team provided the RVSBP staff with the following materials.

- Interpretacion Ambiental by Dr. Sam Ham
- Interpretación Personal by Tim Merriman and Lisa Brochu, National Association for Interpretation
- Comprehensive Interpretive Plan for the National Historic Oregon Trail Interpretive Center (example of a National Park Service Comprehensive Interpretive Plan format)
- Theme Guide (example of a National Park Service Interpretive Plan process)
- Outline for Ecotourism Class in Spanish
- Three handouts on trail design and construction
- Three examples of text and artwork for interpretive trail signing

9. Sources consulted.

The following sources were consulted as part of the team's evaluation of the programs and operations.

- Refugio de Vida Silvestre Bocas del Polochic Plan Maestro II 2003-2007, 12/2003 by Fundación de Defensores de la Naturaleza.
- Desarrollo de una metodología de Evaluación Ecoturistica y su Implemetacion en la Micorregion Corridor Biológico Sierra de las Minas-Bocas del Polochic, Izabal, Guatemala por Sandra Maria de Urioste Caicedo, 1997 (thesis).
- Plan de Interpretación Ambiental para El refugio de Vida Silvestre Bocas del Polochic , El Estor, Guatemala por Lucrecia Maria Bauer Weissenburg, 1999 (thesis).
- Registro de Visitantes de la Estacion Científica de Selempin Que Estan Pagando Servcio, Septiembre 1999-Presente
- Site Interpretive and Information Materials Developed for Visitors
    - Selempin-Informacion
    - Sendero Interpretiva de la Cotuza
    - El Sendero Cultural
    - El Sendero Acuatico
    - Aves Comunes
    - Listas de Especies: Plantas Acuaticas, Plantas Medicinales, Orquídeas y Bromelias, Peces, Culebras, Lagartijas, Caimanes, Anfibios, Mamíferos
    - Tourismo de Baja Impacto-Un Codiga de Conducto por Visitantes a Selempin
    - Cuestiones Para Visitantes (3 versions)
- Extensive interviews with Herberth Reich, Heidi Garcia de la Vega, and Monica Paulson.
- Interviews conducted with Aroldo Choc Ramos, Arnoldo Caal, Santiago Pana, and Alfonso Perez, the resource guards for the RVSBP, as well as the staff

representative of Cooks Travel Agency in the Camino Real Hotel in Guatemala City.

CONCLUSION AND TECHNICAL ASSISTANCE FOLLOW UP

Over the course of the two week visit to RVSBP, the team gained a good understanding of both the opportunities and challenges facing the FDN in managing the refuge. The existing infrastructure at Selempin and the presence of an interested, dedicated, and skilled core staff combine to provide a strong based from which to develop a more comprehensive program and to further realize the vision and goals established for this special protected area. Under the guidance of Herberth Reich, the team has full confidence that Heidi Garcia de la Vega of FDN and Monica Paulson, the Peace Corp Volunteer assigned to FDN for the next two years, will more fully develop the Interpretation and Ecotourism Programs and make significant strides in implementing the recommendations of this report.

Team recommendations for potential technical assistance follow up trips include the following:

- Develop and construct the recommended terrestrial Self-Guiding Birding Trail. This would involve identifying the range of habitats to include, design of the blinds and/or canopy viewing platforms, routing and constructing the trail and blinds, and developing the associated printed materials and guides. This work would be difficult to complete during the peak of the rainy season from June-early September as sections of the proposed trail would likely be under water.

- Develop and conduct guide training courses for refuge staff, community members, tour business operators (launches, hotels, etc.). This could be combined with similar courses offered for locations in Sierra de las Minas.

- Assist with biological monitoring projects in support of more detailed information to include in interpretive, educational, and outreach materials. Suggestions include radio telemetry for the manatees, additional terrestrial bird surveys, etc.

- Complete a detailed cave survey using a cave specialist.

Photo Appendix:
Bocas del Polochic
4/26/04 to 5/6/04

Figure 1:

View looking north across the Bocas del Polochic, a protected wetland area at the west end of Lake Izabal. The lake is faintly visible in the right background, below the Sierra Santa Cruz. The Selempín Scientific Station and Kekchi community are hidden behind the series of low hills in the middle distance. Left of the hills, parallel rows of African palms are within the adjacent *finca* that has provided land for the station, and for the replanted biological corridor linking the wetland with the Sierra de Las Minas to the south.

In the foreground is a deforested plot of land planted in corn and beans. Lack of flat, arable land forces the Kekchis to plant on these slopes. This is a viewpoint along the Sendero Cultural (cultural trail), one of several trails developed for tourists but also used by locals. Guides explain the significance of forest resources to the local Kekchi people. It is unclear whether this agricultural plot lies within the intended biological corridor.

Figure 2:
Bathrooms (left) and research cabin (right) at the Selempín Scientific Station, showing typical construction techniques. Walkways and foundations are raised due to seasonal inundation during June-November. Thatched roofs need replacement every 5 years.

Figure 3:
Interior view of the headquarters and guest facility at Selempín Scientific Station. The upper level accommodates separate bunk dormitories for men and women (14 each). Photovoltaic panels provide limited electric power.

Figure 3:
Looking south along the western edge of Lake Izabal and adjacent wetland, below the eastern Sierra de Las Minas. This margin of the lake is officially protected due to the presence of the endangered West Indian Manatee.

Figure 4:
Approaching Selempín by boat along the Rio Oscuro. For tourists, the most enjoyable means of reaching Selempín is by boat from El Estor, about 45 minutes away on the shore of Lake Izabal.

Figure 5:

A shallow tributary of the Rio Oscuro leading to Selempín. Bird life is abundant and diverse here. Invasive carpets of water lily and water hyacinth sometimes impede boat traffic.

Figure 6:

Guardarecursos and guide Santiago Pana poles a boat along the Sendero Acuático (water trail) near Selempín. Avoiding use of the outboard motor maximizes visitors' opportunity to encounter wildlife. The sharp-eyed guides recognize many species, nests, and traces. This trip is the best tourist experience available at Selempín. The operation would benefit from having more boats available--perhaps for short, self-guided excursions.

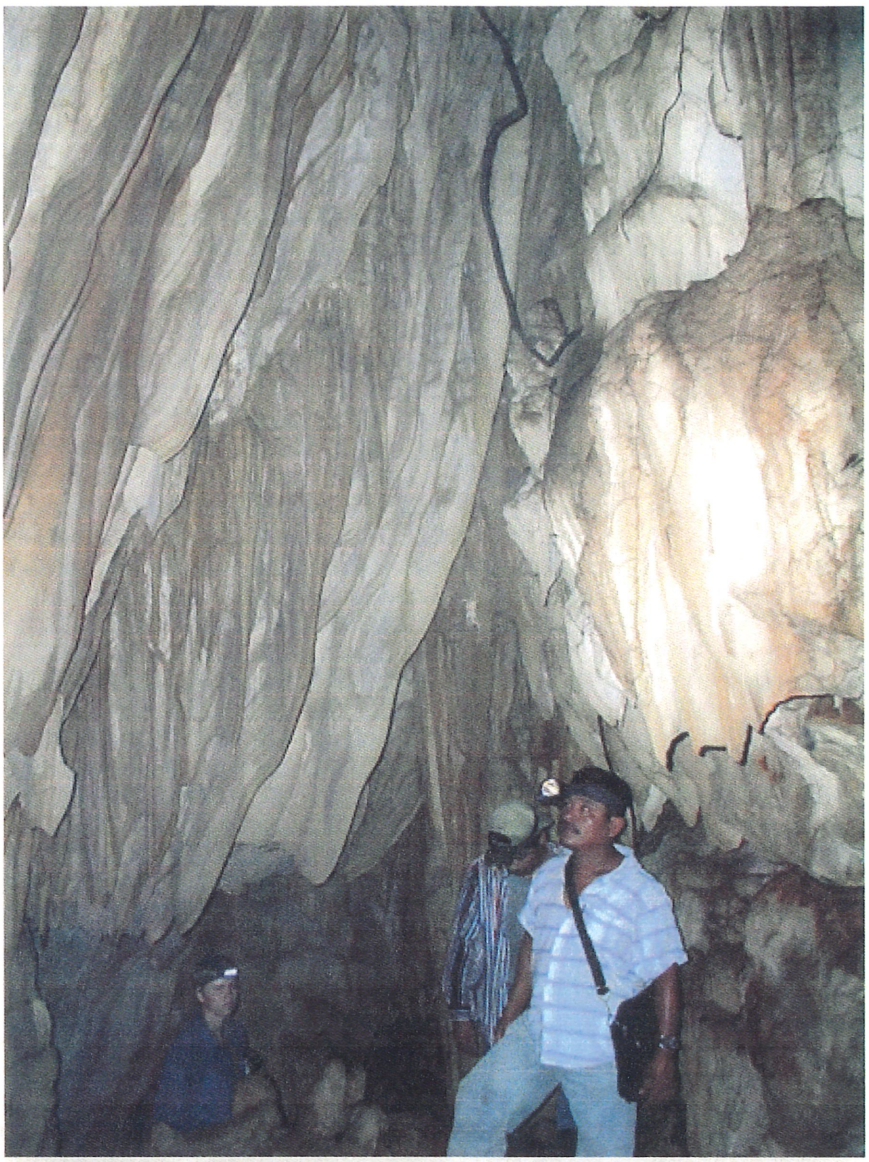

Figure 7:

Exploration of an unnamed cave, one of two caves proposed for tourism development.

Left to right: Peace Corps Volunteer Monica Paulson, FDN site manager Herberth Reiche, *guardarecursos* / guide Arnoldo Caal,

Safety issues, and the presence of archaeological materials, led us to recommend that the caves remain closed to the public—at least until further scientific assessment is completed.

Figure 8:

Human jawbone in Cueva La Armadilla. This and other bones were cemented in place by calcite, evidence of considerable age. We also noted numerous fragments of low-fired redware pottery, presumed contemporary with the bones. No complete skeletons were seen. Although measurements were not taken, the jaw and other bones seemed unusually large. We recommend an archaeological assessment of these materials.

Figure 9:

Women from the nearby Kekchi village of Semuy 1, aka Selempín, carrying *morales* (shoulder bags) they wove for sale to tourists. Over 100 of these bags had been ordered for guests at a professional retreat, scheduled to take place at Selempín Scientific Station in the coming month.

Figure 10:

Kekchi women using floor looms in a crafts training program that provides one opportunity for the local community to profit from tourism. Community members also cook for tourists and station staff, and occasionally rent boats and act as guides on water tours.

Figure 11:
Palm oil processing facility adjacent to Selempín and the Minas-Polochic biological corridor. The African Palm *finca* and factory provide paid employment to supplement subsistence farming and fishing in surrounding Kekchi villages.

Figure 12:
Selempín Scientific Station staff and volunteers. Left to right: Herberth Reiche (FDN site manager), Arnoldo Caal, Bonnie Lippitt (DOI-ITAP team member), Santiago Pana, Monica Paulson (Peace Corps volunteer), Alfonso Perez, Michael Williams (DOI-ITAP team member), Aroldo Choc Ramos.