



Aquatic Debris

Chapter 5


Large debris commonly found at the Martín Peña Channel.

CHAPTER FIVE: AQUATIC DEBRIS ACTION PLAN

GOAL

Improve habitat quality and enhance the aesthetic, recreational, and economic values of the SJBE by ensuring that the watershed is free of aquatic debris.

OBJECTIVE 1

- Significantly reduce the amount of aquatic debris that reaches all estuarine waters.
- Action AD-1**  Develop and implement community-based solid waste management and recycling programs in coordination with municipalities. **Page 178**
 - Action AD-2** Continue to implement the Action Plan Demonstration Project developed in Piñones, Loíza. **Page 182**
 - Action AD-3** Continue the annual aquatic debris clean-up event held in Islote de la Guachinanga. **Page 185**
 - Action AD-4** Conduct periodic aquatic debris clean-up activities at suggested SJBE locations. **Page 187**

OBJECTIVE
2

Develop, promote, and implement voluntary compliance and pollution prevention initiatives.

Action AD-5 Establish Solid Waste Pollution Prevention Pilot Programs at different SJB locations. **Page 190**

OBJECTIVE
3

Strengthen the enforcement of littering laws and regulations.

Action AD-6 Implement measures to detect, correct, and control illegal dumping activities and enforce Puerto Rico's Anti-Littering Law (Law No. 11 of 1995). **Page 193**

Action AD-7 Enforce the Law for the Management of Used Tires (Law No. 171) and other regulatory measures related to the illegal dumping of used tires within the estuary system and its drainage basin. **Page 197**

 AD-1

Develop and Implement Community-Based Solid Waste Management and Recycling Programs in Coordination with Municipalities.

BACKGROUND

Due to historic, geographic, and economic reasons, residents and businesses in many of the communities adjacent to the estuarine system have disposed of large amounts of waste in and around the estuary's waterways throughout the years. A 1995 public perception poll conducted by the SJBE Program indicated that residents are quite concerned about this highly visible problem. Aquatic debris not only affects the aesthetic value of the estuarine system, but also poses health and environmental risks to all human, animal, and plant life within the ecosystem. Both Law No. 11 of 1995 and Law No. 64 of 1991 address littering and the illegal disposal of garbage, but enforcement is difficult, and there is a need for more rapid response by authorities to reported illegal dumping incidents.

Puerto Rico's Solid Waste Reduction and Recycling Law (Law No. 70 of 1992) required each municipality on the island to address the growing solid waste problem by submitting a Solid Waste Management and Recycling Plan to the Solid Waste Management Authority (SWMA) by May 1995. The plan must specify the municipality's proposed strategies to recycle 35 percent of its solid wastes by the year 2004 and effectively manage and dispose of remaining solid wastes. However, by the end of 1998, only 5 of the 8 municipalities within the SJBE study area (Bayamon, Cataño, Guaynabo, Carolina, and Loíza) had submitted their final plans to the SWMA. The Municipality of Carolina's Recycling Plan has already been approved by the SWMA. Thus, it is of extreme importance that the SWMA and the EQB give a compliance plan (with notices of violation and penalties) to the four municipalities without Solid Waste Management and Recycling Plans to comply with Law No. 70. As these plans are completed, steps should be taken to ensure that the solid waste management problems related to the SJBE are considered and accounted for in each of the municipalities' plans.

Although some of the municipalities in the SJBE Program area do not have formal waste management and recycling plans, numerous solid waste management and recycling initiatives have been started by the municipalities. For example, the municipality of San Juan has been providing technical assistance on the efficient management and disposal of solid wastes to the communities of Israel, Bitumul, Barrio Obrero, Sierra Maestra, San Jose, and Canteras. In addition, it has developed a monitoring program that evaluates the effectiveness of the private companies handling the municipality's solid waste. The objective of this monitoring program is to assess the private firms' performance through periodic evaluations and notify them of any errors or delays in material collection services. Another example is the initiative conducted by the People's Recycling Península de Cantera Inc., P.T., a community-owned recycling enterprise that collects and transports recyclable materials and conducts source reduction and waste recycling educational activities in the community of Cantera. In the community of Piñones, the SJBE Program initiated a waste management and recycling APDP at numerous food and beverage establishments. This pilot project incorporates an educational campaign

aimed at reducing the quantity of solid wastes generated in the area and modifying the waste disposal and recycling habits of business owners and visitors. (See Action AD-2 for additional information on the Piñones APDP.) These types of initiatives help reduce the amount of aquatic debris that reaches the estuary system and improve the quality of life of surrounding communities. This action calls for the development and implementation of additional community-based solid waste management and recycling initiatives in collaboration with municipal governments.

STRATEGY

- 1.1** Assure that the eight municipalities that are part of the estuary’s drainage basin develop their Solid Waste Management and Recycling Plans as required by Law No. 70. These plans should include measures to mitigate some of the major problems associated with solid waste management, aquatic debris, and illegal dumping in the SJBE. The state government (EQB and SWMA) should create compliance plans, with notices of violation and penalties, for those municipalities that have not developed their plans.

Implementing partners: SWMA (lead), Municipalities, EQB, SJBE Program, AmeriCorps

Schedule: Short-term/on-going

Cost: \$100,000

- 1.2** Determine specific waste management and recycling strategies for identified critical areas where large amounts of aquatic debris are found (“hot spots”). Identify deficiencies in the waste management services provided by local governments to communities adjacent to the estuary system (such as delayed waste collection services or nonexistent service) as well as any deficiencies in the enforcement of solid waste disposal laws.

Implementing partners: SWMA (lead), Municipalities, Community Groups, EQB, SJBE Program, AmeriCorps

Schedule: Short-term/on-going

Cost: \$50,000 to \$100,000

- 1.3** Launch an educational campaign (initially in communities adjacent to critical areas) stressing the importance of the SJBE system and the need to establish and support effective solid waste management and recycling initiatives as a step to restore the quality and health of the local environment and the estuary system as a whole. Such a program should include information about the interconnectedness between the estuary system and local areas and promote the establishment of community-based solid waste management and recycling programs.

Implementing partners: SWMA (lead), Municipalities, EQB, SJBE Program, SJBE CAC, Community Groups, AmeriCorps

Schedule: Short-term/ongoing

Cost: \$100,000 to \$150,000

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- 1.4** Meet with community members and local government representatives to identify leaders willing to organize a waste management and recycling program. In communities where programs already have been established, meet with program representatives to assess the need for additional support.
- Implementing partners: SWMA (lead), Municipalities, EQB, SJBE Program, Community Groups, Local Communities, AmeriCorps
Schedule: Short-term
Cost: \$25,000 per year
- 1.5** Assist and support local communities in the development of waste management and recycling programs designed to meet their particular needs. This will include identifying recyclable materials, determining when, where, and how the material will be collected, and coordinating transportation of the material to recycling centers.
- Implementing partners: SWMA (lead), Municipalities, Private Waste Management and Recycling Companies, Interested Public and Private Entities, AmeriCorps
Schedule: Short-term
Cost: \$30,000 per year per community
- 1.6** Conduct regular monitoring and evaluation of the ongoing waste management and recycling activities in each community. Study the feasibility of using the Municipality of San Juan's Solid Waste Monitoring Program as an example for other municipalities. All recycling data collected (quantity of materials collected, reused, or recycled [tons], type of material, transportation costs, final disposal) should be submitted in a quarterly report to the SWMA's Recycling Division.
- Implementing partners: SWMA (lead), Municipalities, EQB, SJBE Program, Local Communities, Community Groups, Private Waste Management and Recycling Companies, AmeriCorps, etc.
Schedule: Short-term
Cost: \$25,000 per year

EXPECTED BENEFITS

The development and implementation of formal solid waste management and recycling plans within SJBE communities will greatly reduce the amount of waste that enters the SJBE system. Reducing solid waste in the estuary system will improve the quality of life for local residents and improve the estuary's environmental quality and health. In addition, a reduction in the quantity of debris in the estuary should help to reduce marine wildlife injury and mortality related to ingestion of or entanglement with aquatic debris.

MONITORING ENVIRONMENTAL RESPONSE/PROGRAMMATIC IMPLEMENTATION

Baseline data will be collected on the type and quantity of debris currently found in the estuary system. This information will be compared to data collected during visual surveys and estuary clean-up events in order to gauge the success of the waste management and recycling programs.

REGULATORY NEEDS

Enforcement of Law No. 11 of 1995, which addresses littering and the illegal disposal of garbage. Enforcement of Law No. 70 of 1992, which requires the development of Municipal Solid Waste Management and Recycling Plans. Compliance plans should be developed and enforced by the EQB and SWMA to ensure that these laws are followed.

ACRONYMS

SJBE = SAN JUAN BAY ESTUARY

SWMA = SOLID WASTE MANAGEMENT AUTHORITY

EQB = ENVIRONMENTAL QUALITY BOARD

DNER = DEPARTMENT OF NATURAL AND ENVIRONMENTAL RESOURCES

CAC = CITIZENS ADVISORY COMMITTEE

APDP = ACTION PLAN DEMONSTRATION PROJECT

BACKGROUND

The Piñones community is located in the eastern section of the SJBE system and is part of the Municipality of Loíza. Hundreds of people visit the area during weekends and holidays to enjoy the nearby beaches and the many food stands located along the road that offer traditional Puerto Rican foods. Unfortunately, however, these two activities, recreation and food consumption, generate large amounts of trash, and there is a lack of adequate infrastructure (trash cans, waste collection services, etc.) to meet current waste generation levels. Although the municipal waste collection service and Department of Natural and Environmental Resources (DNER) personnel are responsible for cleaning up the debris, the large size of the affected area and the large volume of debris overwhelm their clean-up efforts. The presence of this debris negatively affects the recreational, aesthetic, and natural values of the area. Law No. 11 of 1995 addresses littering and the illegal disposal of garbage, but enforcement is difficult.

In order to address the different problems associated with marine debris and litter in Piñones, the SJBE Program joined the Center for Marine Conservation's (CMC) Model Community Project campaign in 1998 by developing a community-based waste management and recycling pilot project. This one-year pilot project consisted of waste collection and recycling paired with an educational campaign aimed at waste minimization. The project was implemented in an area locally known as "El Redondel," which is comprised of 14 small restaurants. The program has been very successful in modifying the waste disposal and recycling habits of business owners and visitors.

Residents, local business owners, visitors, private firms, local government, and state agencies all participated in the Piñones Model Community Project. Each small restaurant was provided with the necessary infrastructure (including cans for recyclable materials, a local collection center, and collection services) to support the recycling initiative. Andrés Reyes Burgos, Inc. (ARB, Inc.), a private recycling and waste management company, donated 12 containers for recyclable materials and provided one drop-off industrial-size container and transportation of the materials from the local collection center to a processing facility. The PR Coca-Cola Bottling Company donated 25 additional recycling bins and provided promotional banners. The SJBE Program, with the assistance of the municipal government, the Sea Grant Program, the Puerto Rico Green Team, and numerous volunteers, conducted various clean-ups in the area. One of these clean-ups focused on the removal of large wastes, such as abandoned cars, refrigerators, and ovens.

An evaluation of the pilot project, which helped identify possible project improvements and establish a new strategy to effectively manage and recycle local businesses' materials, was conducted in January 1999. Based on this preliminary assessment, the SJBE Program identified a need to develop a strategy for the sustainability and longevity of the Piñones Model Community Project. After issuing a Request for Proposals for an Action Plan Demonstration Project (APDP) to address this

issue, the Green Team, a nonprofit environmental organization dedicated to promoting recycling initiatives in Puerto Rico, was chosen to carry out the APDP.

Currently, the Green Team is collecting glass bottles, aluminum cans, cardboard, and cooking oil from El Redondel's 14 establishments three times a week. In addition, it has developed a marketing campaign to further promote the pilot project. In the future, the SJBE Program and the Green Team plan to extend the scope of the pilot project from 14 business establishments to an area-wide recycling and waste minimization program with the development of a community recycling center. All recyclable materials will be sorted and processed in the Center prior to sale and transport to various recycling industries.

This action addresses the additional steps that will need to be taken to ensure that recycling and waste minimization efforts are continued and expanded in the Piñones community.

STRATEGY

- 2.1** Conduct a series of forums or surveys in which business owners, residents, visitors, and other stakeholders can evaluate the current waste reduction and recycling APDP. This information can be used to help identify the problems and successes related to the pilot project.

Implementing partners: Puerto Rico Green Team (lead), SJBE Program

Schedule: Mid-term. APDP is ongoing at "El Redondel".

Cost: \$10,000 to \$15,000 (Various funding sources are currently providing economic support to this demonstration project.)

- 2.2** Develop a guidebook that can serve as a reference tool for communities that wish to develop similar waste management programs. Document the strategies used in the implementation of this APDP and its results in the guidebook. Share the success of this demonstration project with the local community, and, if requested, provide assistance and training in the development of similar initiatives. Expand the initiative conducted in "El Redondel" to other commercial areas in Piñones.

Implementing partners: Puerto Rico Green Team (lead), SJBE Program, SWMA, Municipality of Loíza, Interested Public and Private Entities

Schedule: Mid-term/immediately after the APDP has been completed.

Cost: \$65,000 to \$75,000 per year

- 2.3** Study the feasibility of developing a self-sufficient community recycling center in the community of Piñones. This study should consider financial and infrastructure needs (i.e., location availability, building renovations).

Implementing partners: Puerto Rico Green Team (lead), Municipality of Loíza, SWMA, SJBE Program

Schedule: Mid-term

Cost: \$30,000 to \$35,000

2.4 If feasible, assist and support the development of the community recycling center.

Implementing partners: Puerto Rico Green Team (lead), Municipality of Loíza, SWMA, SJBE Program, Private Waste Management and Recycling Companies, Sponsors

Schedule: Mid-term

Cost: \$12,000

EXPECTED BENEFITS

The positive impact of CMC's Model Community Project is already evident in the improved appearance of El Redondel and the participation levels and commitment to recycling within the business community. Continuation and expansion of waste reduction and recycling in the Piñones community will ensure that these benefits continue and will lead to increased awareness and sensitivity towards waste management issues by business owners. Recycling initiatives will have positive economic impacts on the community.

Reducing solid waste in the estuary system will improve the quality of life for local residents and improve the estuary's environmental quality and health. In addition, a reduction in the quantity of debris in the estuary should help to reduce marine wildlife injury and mortality related to ingestion of or entanglement with aquatic debris.

MONITORING ENVIRONMENTAL RESPONSE/PROGRAMMATIC IMPLEMENTATION

Follow-up surveys will be performed to measure results and evaluate the effectiveness of the new community recycling center. These monitoring activities could include comparative results analyses and public participation surveys.

Public participation will be measured by tracking changes in the total number of participants using the recycling center. The quantity of recovered materials will be compared each month. Environmental improvements will also be measured by tracking reductions in the amount of litter on streets, businesses' surroundings, dune areas, beaches, and mangroves. Photographs and public perception surveys could be used to measure these changes. Any revenue or jobs created by this project will also be quantified.

REGULATORY NEEDS

None.

ACRONYMS

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SWMA = SOLID WASTE MANAGEMENT AUTHORITY

DNER = DEPARTMENT OF NATURAL AND ENVIRONMENTAL RESOURCES

CMC = CENTER FOR MARINE CONSERVATION

ARB, INC. = ANDRÉS REYES BURGOS, INC.

PR = PUERTO RICO

APDP = ACTION PLAN DEMONSTRATION PROJECT

AD-3

Continue the Annual Aquatic Debris Clean-Up Event Held in Islote De La Guachinanga.

BACKGROUND

Islote de la Guachinanga is a small island located in the western part of the San José Lagoon, southeast of the Cantera Peninsula, in the Municipality of San Juan. This island is part of the system of limestone hills that begin on the northwestern tip of Puerto Rico and extend eastward to the Municipality of Loíza. During the 1940s and 1950s, Islote de la Guachinanga was popular with the residents of Península de Cantera as a recreational area for swimming, fishing, picnics, and religious ceremonies.

Currently, the small island's shores are surrounded by waste and aquatic debris (mostly from the urban area draining into the San José Lagoon) brought by the action of waves and water currents. Although the island is not presently visited due to its degraded environmental condition, it has become a symbol of unity for the community of Cantera. Since 1994, the Neighbors' Council of Cantera has organized an annual clean-up event on Islote de la Guachinanga. It is the closing event of the Environmental Week that is held every year in the community. During the event, tons of aquatic debris are collected by enthusiastic local participants. In addition, informational materials are distributed to raise awareness on environmental and health issues. This annual clean-up event is one of the most successful solid waste and aquatic debris collection and public education campaigns in the region. The SWMA has supported the clean-up event's public education campaign for many years with educational materials, plastic bags, and trash cans.

AD-3

STRATEGY

3.1 Continue educational campaigns to increase public awareness about the natural and recreational values of Islote de la Guachinanga and the importance of keeping it trash free.

Implementing partners: Community Groups (lead), Neighbors' Council of Cantera, Municipality of San Juan, DNER, SWMA, SJBE Program, AmeriCorps

Schedule: Mid-term/ongoing

Cost: \$25,000 to \$30,000

3.2 Assist the Neighbors' Council of Cantera in the organization and operation of its annual clean-up event. The Council welcomes assistance in different areas, such as securing sponsors for the event and ensuring participation by local volunteer groups.

Implementing partners: Community Groups (lead), Neighbors' Council of Cantera, Municipality of San Juan, SWMA, SJBE Program, CMC, AmeriCorps

Schedule: Mid-term/yearly

Cost: \$18,000 to \$20,000. (In previous years, the Municipality of San Juan has covered all material collection and transportation costs for the activity.)

EXPECTED BENEFITS

Continuation of the annual clean-up program at Islote de la Guachinanga will ensure continued improvement in the health and environmental conditions of the island, thus enhancing its recreational and natural values. The program increases public awareness about the detrimental effects of aquatic debris in natural areas and the estuary system as a whole.

MONITORING ENVIRONMENTAL RESPONSE/PROGRAMMATIC IMPLEMENTATION

Baseline information will be collected and documented for comparative purposes. Follow-up visits and visual surveys will be conducted to monitor conditions and analyze the success of clean-up activities.

REGULATORY NEEDS

None.

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AD-4**Conduct Periodic Aquatic Debris Clean-Up Activities at Suggested San Juan Bay Estuary Locations.****BACKGROUND**

Due to historical, geographical, and economical reasons, residents and businesses in many of the communities adjacent to the estuarine system have disposed of large amounts of waste in and around the estuary's waterways throughout the years. A 1995 public perception poll conducted by the SJBE Program indicated that residents are quite concerned about this highly visible problem. Aquatic debris not only affects the aesthetic value of the estuarine system, but also poses health and environmental risks to all human, animal, and plant life within the ecosystem. Entanglement and ingestion of aquatic debris is one of the leading causes of marine animal mortality (Coastal Challenges, 1998). Debris can also foul boat propellers and cause engine failures by clogging seawater intakes. Law No. 11 of 1995 addresses littering and the illegal disposal of garbage, but enforcement is difficult.

Since 1989, the Sea Grant College Program, through the Center for Marine Conservation, has organized several coastal clean-up events in the SJBE system. The SWMA, in collaboration with other agencies, has also conducted various clean-ups at different SJBE locations. Clean-up events have taken place at numerous locations across the estuary system, including Piñones, Ocean Park, Condado, Península La Esperanza, Martin Peña Channel, and Juana Matos. These events are effective ways to clean up targeted areas and increase public awareness about the effects of aquatic debris and the extent of this problem in the estuary system. In June 1996, the SJBE sponsored its first clean-up activity in Península La Esperanza. Since then, other clean-ups have been conducted at various SJBE locations. The SJBE Program has had good success in recruiting volunteers from organized groups such as the Boy Scouts and Girl Scouts of America, the Rotary Club, local schools, and community-based organizations, but further work needs to be done to increase levels of participation from individual residents of the communities.

The SJBE Program has selected a number of critical sites within the estuary system that are affected by aquatic debris, such as beach areas intensely used by beach goers and sites that accumulate debris due to the action of waves and water currents and tributary flows. These areas include:

- Palo Seco
- Península La Esperanza
- Port Terminal Areas in the San Juan Harbor
- Villa Palmera/Playita
- Residencial Las Margaritas
- Piñones
- Quebrada Blasina

These and other sites should be considered and evaluated in the planning phases of future clean-up activities. Because most of the aquatic debris found during coastal clean-up activities originates from land-based sources, strategies for clean-up activities as well as pollution prevention initiatives should focus on these sources. Until now, all clean-up events have been held at beach and bay areas. In the future, clean-up activities should also be conducted in the SJBE watershed's tributaries.

STRATEGY

- 4.1** Conduct educational and publicity campaigns to increase public awareness about the natural and recreational values of particular SJBE locations and the estuary system as a whole and the importance of keeping these areas trash free.

Implementing partners: Municipalities (lead), DNER, EQB, SWMA, SJBE Program, CMC, USGS, Community Groups

Schedule: Mid-term/ongoing

Cost: \$150,000 to \$200,000

- 4.2** Organize aquatic debris clean-up events at suggested SJBE sites. Encourage and support local groups of volunteers with their own independently organized clean-ups at SJBE locations.

Implementing partners: Municipalities (lead), DNER, EQB, SWMA, SJBE Program, CMC, Community Groups

Schedule: Mid-term

Cost: \$115,000 to \$130,000. It is important to consider the collection and transportation costs of collected materials. Depending on the sponsorships provided by interested entities, clean-ups can range from \$50 to \$500 per day.

EXPECTED BENEFITS

Reducing solid waste in the estuary system will improve the quality of life for local residents and improve the estuary's environmental quality and health. In addition, a reduction in the quantity of debris in the estuary should help to reduce marine wildlife injury and mortality related to ingestion of or entanglement with aquatic debris. Environmental improvements at suggested areas will enhance their recreational value. The risks to public health related to the presence of debris in waterbodies and beaches will decrease. Clean-up events will increase public awareness about the detrimental effects of aquatic debris on natural areas and the estuary system as a whole.

MONITORING ENVIRONMENTAL RESPONSE/PROGRAMMATIC IMPLEMENTATION

Baseline information will be collected and documented for comparative purposes. Follow-up visits and visual surveys will be conducted to monitor conditions and analyze the success of clean-up activities.

REGULATORY NEEDS

None.

ACRONYMS

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CAC = CITIZENS ADVISORY COMMITTEE

CMC = CENTER FOR MARINE CONSERVATION

USGS = UNITED STATES GEOLOGICAL SURVEY

AD-5

Establish Solid Waste Pollution Prevention Pilot Programs at Different SJBE Locations.

BACKGROUND

Solid Waste Pollution Prevention (P2) Pilot Programs can be used to target pollution “at the source” and effectively reduce the amount and types of solid wastes that reach the estuary. P2 Pilot Programs can be implemented by individuals as well as residential, commercial, governmental, environmental, and industrial groups that are seeking innovative ways to clean-up and restore the estuarine system. These programs provide interested groups with reasonable alternatives, beneficial to all parties, for solid waste minimization, reuse, recycling, and disposal processes.

The SJBE Program has identified a number of sectors in which pollution prevention initiatives could be established.

- Communities – adequate household hazardous waste management and disposal
- Industries – reduction of inputs and outputs through solid waste stream analysis
- Automobile Maintenance Shops – used oil management
- Marinas – development of pump out facilities and participation in DNER’s Good Mate Program
- Ship Offshore Operations – preventing materials from blowing off decks while in port

Interested parties and the SJBE Program should coordinate P2 initiatives with the Environmental Quality Board’s (EQB) Land Pollution Control Program and the Solid Waste Management Authority’s (SWMA) Pollution Prevention Program. These two programs have established a number of P2 projects on the island and will be instrumental for technical assistance and in the development of additional programs.

STRATEGY

5.1 Gather data about solid waste minimization, reuse, recycling, and disposal practices at chosen sites.

Implementing partners: EQB (lead), SWMA, Participating Entities

Schedule: Mid-term

Cost: \$30,000 to \$50,000

5.2 Evaluate the impact, if any, of these practices on the SJBE system.

Implementing partners: EQB (lead), SWMA, SJBE Program

Schedule: Mid-term (Within 180 days after completion of pilot project)

Cost: \$30,000 to \$50,000

- 5.3** Assist participating entities in conducting self-assessments to identify methods for voluntarily minimizing solid waste generation and disposing of waste in a cost-effective manner.
Implementing partners: EQB (lead), SWMA, SJBE Program, Participating Entities
Schedule: Mid-term
Cost: \$30,000 to \$50,000
- 5.4** Conduct routine inspections to monitor the effectiveness of the P2 pilot program.
Implementing partners: EQB (lead), SWMA, Participating Entities
Schedule: Mid-term
Cost: \$30,000 to \$50,000
- 5.5** Maintain detailed records of all the data collected, recommendations provided, and changes in operational practices in order to develop resource guides that could potentially be used by similar entities in the SJBE (or on the island) that are interested in pollution prevention initiatives.
Implementing partners: EQB (lead), SWMA, Participating Entities, SJBE Program
Schedule: Mid-term
Cost: \$30,000 to \$50,000
- 5.6** Evaluate and create adequate incentives to compel future voluntary compliance in the business, industry, agricultural, and commercial sectors.
Implementing partners: EQB (lead), SWMA
Schedule: Mid-term
Cost: \$100,000

EXPECTED BENEFITS

Solid Waste P2 Pilot Programs will increase knowledge about innovative waste minimization techniques in the private sector. Successful P2 pilot programs will reduce solid waste and aquatic debris in the estuary system, improving environmental conditions. Replication of successful P2 pilot projects at other interested sites will lead to further waste minimization and control efforts and improvements to the environmental conditions of surrounding areas.

MONITORING ENVIRONMENTAL RESPONSE/PROGRAMMATIC IMPLEMENTATION

Qualified personnel should develop and maintain comprehensive monitoring programs for each P2 pilot project. EQB and SWMA staff should conduct periodic inspections of the participating entities to evaluate the effectiveness of the P2 program and provide recommendations.

REGULATORY NEEDS

None.

ACRONYMS

SJBE = SAN JUAN BAY ESTUARY

SWMA = SOLID WASTE MANAGEMENT AUTHORITY

EQB = ENVIRONMENTAL QUALITY BOARD

P2 = POLLUTION PREVENTION

DNER = DEPARTMENT OF NATURAL AND ENVIRONMENTAL RESOURCES

AD-6**Implement Measures to Detect, Correct, and Control Illegal Dumping Activities and Enforce Puerto Rico's Anti-Littering Law (Law No. 11 of 1995).****BACKGROUND**

Numerous clandestine dumps filled with piles of construction materials, household wastes, large-sized wastes, and other debris can be found abandoned in areas throughout the SJBE. By disposing of wastes illegally at clandestine sites at no cost, dumpers avoid the high costs of legal disposal in a municipal landfill. Illegal dumping is expected to get worse when the San Juan Municipal Landfill closes in the year 2000. This landfill currently charges approximately \$80 per ton for disposal. Once it closes, disposal prices are expected to increase due to the cost associated with the transportation of wastes to municipalities outside of the San Juan area.

Law No. 11 of January 19, 1995, addresses littering and the illegal disposal of garbage. Law No. 11 authorizes agents from the State Police, Municipal Guards, and the DNER Rangers Corps to impose fines and seize driver's licenses of individuals that place, deposit, throw, or dump any material, waste, or trash in a public right-of-way or unauthorized area. Fines range from \$100 to \$1,000, depending on the quantity of material that is illegally disposed. Under Law No. 11, the fines collected are placed in a Special Fund of the National Treasury and then reassigned to the jurisdiction that imposed the fine. Fines are to be used for citizen reporting, monitoring, and public education programs related to solid waste disposal and environmental conservation.

Municipalities within the SJBE have had varying success in the implementation and enforcement of Law No. 11. For example, the implementation of a municipal ordinance in Loíza, which is very similar to Law No. 11, has successfully reduced illegal dumping activities. The municipality's recycling coordinator trained enforcement agents on the importance of the ordinance and Law No. 11. Instituting fines has resulted in a noticeable reduction in the quantity of large-sized wastes, such as abandoned vehicles and refrigerators. However, enforcement agents have indicated that it is difficult to ensure that cases are followed through from beginning to end (ticketing through prosecution). In many cases, for example, agents from the DNER Rangers Corps stated that while fines are being imposed through ticketing, the cases are not being prosecuted by DNER's Legal Division, making enforcement difficult.

In Loíza and San Juan, increased public awareness about the Law has improved enforcement. In the community of Península de Cantera, for example, the People's Recycling Península de Cantera, P.T. Inc. educated residents on how to notify the State Police and Municipal Guards about illegal dumping activities. Residents are encouraged to report the license plate number of a vehicle engaged in illegal dumping. The agents then conduct a follow-up investigation. However, there have been some drawbacks to community involvement in the implementation of this law. If an agent does not see the illegal act, residents are asked to go to court and identify the responsible party; residents are usually reluctant to participate in this process.

Further information is needed to determine how municipalities and enforcement agents within the SJBE system are implementing Law No. 11, what problems they are facing, and what improvements can be made.

STRATEGY

6.1 Study how municipalities within the SJBE system, the State Police, the Municipal Guards, and the DNER Rangers Corps are implementing Law No. 11, what problems are occurring, and what improvements can be made in law enforcement. Verify that all provisions of Law No. 11 are being met, particularly the reassignment of funds acquired from fines to specific jurisdictions. Make any legal or judicial changes that are needed for the Law's effective implementation. Require legal staff at different agencies to pursue prosecution of significant cases. Evaluate the effectiveness and use of DNER's Clandestine Dump Hotline (1-800-981-7888).

Implementing partners: DNER, SWMA (lead parties), DNER Rangers, Legislature, Municipalities, DTPW, State Police, Municipal Guards, EQB, SJBE Program, Local Communities

Schedule: Short-term/ongoing

Cost: \$50,000

6.2 Train municipal and state government staff from pertinent departments (public works, utilities, street cleaning, parks and recreation, sewer maintenance, community and industrial waste inspection, hazardous waste inspection, etc.) to recognize and report illegal dumping activities. Train and provide incentives for the State Police, Municipal Guards, and the DNER Rangers Corps in the enforcement of Law No. 11.

Implementing partners: DNER, SWMA (lead parties), DNER Rangers, EQB, Municipalities, DTPW, SJBE Program, Local Communities

Schedule: Short-term

Cost: Administrative costs

6.3 Identify and evaluate critical areas ("hot spots") within each municipality where illegal dumping grounds and large quantities of debris are found. Prioritize and target those critical areas that are having a direct negative effect on the health of the estuary system and the quality of life of surrounding communities. Establish a system for tracking illegal dumping activities to help determine trends and identify who, what, when, and where efforts should be concentrated. At a minimum, this tracking system should include the following:

- Locations of illegal dumping "hot spots" (map, pictures, etc.);
- Types and quantities of materials;
- Dates and times of occurrence;

- Methods of disposal (abandoned containers, midnight dumping, direct dumping of materials, accidents or spills, etc.);
- Responsible parties; and
- Actions taken/status.

Implementing partners: DNER, SWMA (lead parties), DNER Rangers, Municipalities, EQB, SJBE Program, DTPW, Local Communities

Schedule: Short-term

Cost: \$50,000

- 6.4** Take necessary remedial actions to remove debris and clean up critical areas. Establish physical barriers (such as fences or walls) to prevent further dumping and contamination after these areas are cleaned. Post signs or other printed materials stating the possible consequences of violating littering laws (see Action PI-2). Notify police officials, Municipal Guards, the DNER Rangers Corps, and EQB's environmental specialists of the location of these critical areas so they can conduct inspection and surveillance activities and fine polluters.

Implementing partners: DNER, SWMA (lead parties), DNER Rangers, Municipalities, State Police, Municipal Guards, EQB, SJBE Program, Community Groups

Schedule: Short-term

Cost: Depending on type of site

- 6.5** Study how communities can take a more active role in the enforcement of Law No. 11, and make any legal or judicial changes needed for the Law's effective implementation, focusing in particular on community involvement during the prosecution phase. Conduct a public education and awareness campaign in communities adjacent to critical areas that focuses on illegal dumping. Provide these communities with mechanisms (such as a flyer or a hotline number (see step 6.1)) and incentives (such as reward programs) for reporting incidents. Help communities establish neighborhood watch programs. Incorporate mechanisms for public reporting of illegal dumping into volunteer water quality monitoring initiatives.

Implementing partners: DNER, SWMA (lead parties), DNER Rangers, Legislature, SJBE Program, Local Communities, EQB, Municipalities, State Police, Municipal Guards

Schedule: Short-term

Cost: \$45,000 per year

EXPECTED BENEFITS

Reducing the number of illegal dumping activities and sites will improve the quality of life for local residents and help protect estuarine resources and health. The aesthetics of all affected areas will be enhanced. A reduction in the quantity of debris found in estuarine waters will reduce injuries to marine life and mortalities related to the ingestion of or entanglement with aquatic debris.

MONITORING ENVIRONMENTAL RESPONSE/PROGRAMMATIC IMPLEMENTATION

Critical areas identified in this action should be monitored periodically. Data gathered from such visits should be incorporated into a tracking system. Baseline data obtained will serve as a comparative

measure and progress indicator in the monitoring and evaluation process. Volunteer water quality monitoring initiatives and neighborhood watch programs can assist in monitoring environmental response.

REGULATORY NEEDS

Municipal ordinances should be created or modified to include sections prohibiting the discharge or disposal of sod, debris, refuse, hazardous wastes, and other pollutants at public areas and into the storm sewer system.

ACRONYMS:

SJBE = SAN JUAN BAY ESTUARY

SWMA = SOLID WASTE MANAGEMENT AUTHORITY

EQB = ENVIRONMENTAL QUALITY BOARD

DNER = DEPARTMENT OF NATURAL AND ENVIRONMENTAL RESOURCES

DTPW = DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

AD-7**Enforce the Law for the Management of Used Tires (Law No. 171) and Other Regulatory Measures Related to the Illegal Dumping of Used Tires within the Estuary System and its Drainage Basin.****BACKGROUND**

Each year, approximately 4 million tires are discarded in Puerto Rico's landfills, illegal dumping areas, streets, abandoned industrial areas, and waterways. This translates to a disposal rate of 1.1 tires per person per year. The improper disposal of used tires creates major environmental and health hazards. Tire dumps attract rodents and mosquitoes and tire fires emit hazardous gases. In landfills, tires take up large amounts of space and hinder operations. The current limited capacity of the metropolitan area landfills cannot withstand the ever-growing number of discarded used tires.

In response to the waste management and environmental health problems related to tire disposal, the Legislature of Puerto Rico enacted Law No. 171 in August 1996. This law provides for the proper disposal of used tires.

Under the law, consumers can dispose of one used tire for each tire purchased. Tire dealers cannot charge their clients for this service. Tire dealers must contact an authorized tire manager to collect and transport the discarded tires. Tire managers transport the discarded tires to a processing or recycling facility. Tire managers and tire recycling and processing facilities must be permitted by the Environmental Quality Board (EQB). All the different entities involved must keep detailed reports on the number of used tires generated, collected, transported, and/or processed. Municipalities have the responsibility to inform the Solid Waste Management Authority (SWMA) and the EQB of the number of tire dealer establishments within their jurisdictions. Municipalities are also responsible for supervising and controlling the number of tires stored at the tire dealer's establishment.

Despite the regulation of used tire disposal under Law No. 171, numerous illegal used tire stockpiles have been identified in areas adjacent to the SJBE drainage basin and waterbodies. Preliminary studies by the National Oceanic and Atmospheric Administration (NOAA) indicate the presence of tires at the bottom of San Juan Bay Harbor and in the San Antonio Channel. Most of these tires are located near docking areas, so it is likely that they were used as side protectors by harboring boats and ships. It is important to identify the sources of illegally disposed used tires in the estuary system in order to stop illegal disposal practices. This effort will require an increase in municipal and local level enforcement of Law No. 171 as well as antilittering laws such as Law No. 11 of 1995 (Law No. 171, 1996).

AD-7

STRATEGY

7.1 Identify existing illegal used tire dumping grounds within the estuary drainage basin and waterbodies. Conduct an inventory of the number of discarded tires. Identify critical areas where inadequate used tire disposal is significantly affecting the health of the estuary system and the livability of its surrounding communities. Prioritize mitigation activities within these critical areas. Study the need and feasibility of removing the used tires located at the bottom of San Juan Bay Harbor, especially in the San Antonio Channel. If feasible, develop a detailed Action Plan to conduct an effective strategy for removal.

Implementing partners: SWMA (lead), EQB, Municipalities, SJBE Program, Treasury Department, NOAA, USCG, DNER Rangers

Schedule: Short-term. This step has been completed for one area in the Municipality of San Juan. In this area, tires were removed and a fence was erected to prevent further dumping.

Cost: Insufficient data are available to determine costs at this time. The Treasury Department has funds available to pay for the collection of illegally discarded tires.

7.2 Evaluate deficiencies in the management and disposal processes for used tires and, if possible, identify which entity is responsible for inadequate/illegal disposal practices (for example, tire dealers, tire managers, tire processing or recycling facilities, and, at a more difficult level, individuals). Update the inventory of registered tire establishments in each municipality and conduct an investigation to identify those which are not registered.

Implementing partners: SWMA (lead), EQB, Municipalities, DNER, DTPW, DNER Rangers

Schedule: Short-term

Cost: Insufficient data are available to determine costs at this time.

7.3 Launch an educational campaign in the local communities stressing the need to establish and support effective used tire management and recycling initiatives as a step toward restoring the quality and health of the local environment and the estuary system as a whole. Communities should be aware of the health risks related to the inadequate disposal of used tires (i.e., vectors, fires, etc.) Local communities can serve as a policing entity and inform local authorities of illegal dumping activities. Communities should also be aware of the proper notification channels that can be used in order to inform authorities about illegal littering activities (i.e., who, where, and when to inform). See Action AD-6 for detailed steps regarding illegal dumping controls.

Implementing partners: SWMA (lead), SJBE Program, EQB, Municipalities, DNER, DTPW, DNER Rangers

Schedule: Short-term

Cost: Insufficient data are available to determine costs at this time.

- 7.4** Conduct community-based used tire collection and recycling initiatives. Volunteer activities, such as clean-ups, could be organized in interested communities once a year. Action AD-4 calls for the development of periodic aquatic debris clean-up activities at suggested SJBE locations. These clean-up events should include the collection of large-sized wastes such as used tires in addition to smaller debris.

Implementing partners: SWMA (lead), EQB, Municipalities, SJBE Program, DNER, DTPW, DNER Rangers

Schedule: Short-term

Cost: Insufficient data are available to determine costs at this time. The Treasury Department has funds available to pay for the collection of illegally discarded tires.

- 7.5** Evaluate the feasibility of implementing preventive measures, such as sign posting and the installation of fences to control access into abandoned areas (Action AD-6), to discourage the creation of clandestine and illegal dumping grounds.

Implementing partners: ARPE, DTPW (lead parties), SWMA, EQB, DNER, Municipalities, DNER Rangers

Schedule: Short-term

Cost: \$15,000

- 7.6** Enforce Law No. 171 at the municipal and community levels. It is recommended that municipalities adhere to Law No. 171 and ratify policies and develop programs to improve used tire disposal and management processes in their jurisdictions.

Implementing partners: SWMA (lead), EQB, DNER, Municipalities, State Police, Municipal Guards, DTPW, DNER Rangers

Schedule: Short-term

Cost: Administrative costs

EXPECTED BENEFITS

Strict enforcement of Law No. 171 and other related legal measures will diminish the creation of illegal and clandestine tire dumping grounds. The aesthetics of the affected areas will be enhanced. The public will adopt wiser management practices for the disposal of used tires, which will have a positive impact on the whole environment.

MONITORING ENVIRONMENTAL RESPONSE/PROGRAMMATIC IMPLEMENTATION

Periodic surveys will be conducted throughout the estuary system to identify illegal disposal sites. Such surveys, especially in those areas traditionally used as tire dumping grounds, should improve compliance with the Law.

REGULATORY NEEDS

Law No. 171 of 1996 and Law No. 11 of 1995 address the disposal of used tires and the illegal disposal of garbage, respectively. Compliance plans should be developed and enforced to ensure that these laws are followed and that responsible authorities respond to reported incidents in a timely fashion.

ACRONYMS

SJBE = SAN JUAN BAY ESTUARY

SWMA = SOLID WASTE MANAGEMENT AUTHORITY

EQB = ENVIRONMENTAL QUALITY BOARD

DNER = DEPARTMENT OF NATURAL AND ENVIRONMENTAL RESOURCES

DTPW = DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

USCG = UNITED STATES COAST GUARD

ARPE = PERMIT AND REGULATIONS ADMINISTRATION