EM-2 Reduction of Impacts from Invasive Species

1. **OBJECTIVES**

To prevent and reduce negative impacts caused by the proliferation of invasive exotic species in order to protect the native organisms and resources of the BT Estuary.

1. **BACKGROUND**

Invasive exotic species can be plants or animals that have not historically been part of the natural community and that have the capacity to disrupt natural communities. When invasive exotic organisms move into an area, either through importation or expansion of their range, they leave their natural competitors and predators behind. Without these stressors, invasive exotic species can become established in natural areas and out-compete native species causing adverse ecological changes.

Invasive plants can form monocultures in previously diverse habitats, decrease forage value and displace wildlife habitat. Noxious weeds are very difficult to eradicate and millions of dollars are spent in the U.S. every year to control them. Noxious weeds occur on all types of land, public and private. In addition to species richness, noxious weeds affect farming, recreation, and navigation. Noxious weeds can be imported either accidentally, such as in agricultural crops brought into the U.S. or on purpose, like the infamous water hyacinth give-away at the 1884 Cotton Exposition in New Orleans. To prevent new noxious weeds from establishing in the BTES, there must be controls on both methods of entry.

Exotic plant species impact thousands of acres of wetlands and waterways in the BTES. Aquatic, exotic plants are a particular problem for the BTES, with aquatic weeds invading previously unvegetated water and impeding water flow and navigation. Exotics can change submerged aquatic vegetation community structure and aquatic species composition by impacting food availability, photo zone, dissolved oxygen and other physical qualities of water. Dozens of exotic plant species are established in the Barataria and Terrebonne basins. Among the most serious plant pests are: water hyacinth (Echhornia crassipes), water spangle (Salvinia minima), Eurasian watermilfoil (Myriophyllum spicatum), hydrilla (Hydrilla verticillata), Alligatorweed (Alternanthera philoxeroides), giant salvinia (Salvinia molesta), Chinese privet (Ligustrum sinense), air potato (Dioscorea bulbifera), and Chinese Tallow tree (Sapium sebiferum).

Invasive animals normally move into an area through importation and eventual release into the wild. Releases can be either accidental or planned. Examples of accidental releases in Louisiana include the escape of nutria (Myocaster coypus) imported for the fur industry caused by natural disaster. In other areas of Louisiana, people intent on improving hunting opportunities have moved wild hogs (Sus scrofa) from one area to another. The aquarium industry has been a source of invasive species for many areas when aquarium owners release fish such as Rio Grande cichlids (Herichthys cyanoguttatus), or snails such as apple snails (Pomacea maculata), when they grow tired of maintaining an aquarium. Finally, increases in ambient and water temperatures are allowing some cold intolerant invasive species to expand their ranges. Invasive animals can out-compete native animals for food, consume commercially important plant species, and cause major disruptions of the food web.

Nutria are the best known invasive exotic animal in the BTES. However,many other animal species representing numerous taxa are known to have established and growing populations in, or adjacent to, the BTES. These include apple snails, wild hogs, Rio Grande cichlids, brown anoles (Anolis sagrei), spotted jellyfish (Phyllorhiza punctata), lionfish (Pterois volitans), Asian tiger shrimp (Panaeus monodon), red imported fire ants (Solenopsis invicta), house sparrows (Passer domesticus), and four species of Asian carp (Hypophthalmichthys nobilis, Hypophthalmichthys molitrix, Mylopharyngodon piceus, and Ctenopharyngodon idella).

Controlling exotic species is an on-going battle. There are several steps that can be taken to help battle the problem. Once a species becomes established it is very difficult, if not impossible to eradicate it. Therefore, education and prevention should be considered as a first step in invasive species management. Once populations become established, management and control generally become the only feasible alternative to prevent adverse impacts on the environment. Control efforts will require regional cooperation and planning to prevent new exotic species from becoming established and to control existing species. Continued monitoring and repeat control efforts are necessary for sustainable natural resource management.

1. **DESCRIPTION**

Four key strategies are necessary to address the invasive species problem in Louisiana. These strategies are: (1) education; (2) prevention, and (3) control; and (4) data collection and dissemination. While there is overlap in action items which could be taken to address the invasive species problem, the following identify the general and/or specific steps which could be taken under each strategy to prevent or control invasive species.

Education

1. BTNEP will educate the public on the impact of the invasive species both in the BTES and in adjacent areas. A special effort should be made to identify invasive species which have the potential to establish, or have established, populations in coastal Louisiana. Sources of such information include invasive species reports in other states, as well as exotic species import lists into the country and region.
2. BTNEP will provide guides to the identification of invasive species, as well as how they may be differentiated from similar native species. Included in those guides should be appropriate contact information to report observations of species of special concern.
3. The BTNEP will release (or encourage/assist the creation of) public service announcements on the impacts of invasive species on the human environment and recommend actions people can take to prevent the spread of invasive species.
4. BTNEP will post, or encourage the posting of, educational signage at major boat ramps recommending efforts be undertaken to ensure exotic plants on boats and trailers be removed prior to placing potentially infested boats or trailers into the water.
5. BTNEP will utilize grant program to encourage education efforts specific to control and prevention or data collection/monitoring of invasive species.

Prevention

1. BTNEP will encourage legislative efforts to prevent the import of species identified as potentially invasive to southern Louisiana habitats.
2. BTNEP will post, or encourage the posting of, educational signage at major boat ramps recommending efforts be undertaken to ensure exotic plants on boats and trailers be removed prior to placing potentially infested boats or trailers into the water.

Control

1. BTNEP will help develop laws and regulations aimed at controlling the spread of invasive species, especially those reported to be of most concern or of future threat. Activities include coordination with federal and state law makers as well as federal and state agencies charged with enforcing the regulations.
2. BTNEP will develop projects to encourage the harvest of invasive species using bounties or developing markets for those species.
3. BTNEP will develop, or encourage the development of, projects involving scientists, educators, and the public in the control, management, and eradication of various life stages of invasive species.

Data Collection and Dissemination

1. The program will compile an annual review of information concerning invasive species in the BT Estuary including a list of documented invasive species which highlights species of most concern, species that are currently being targeted by research, and species that are most likely to be invasive in the future.

2. The program will summarize this information in the BTNEP Indicator Report published every five years.

3. The program will sponsor and/or encourage original research efforts on invasive species through projects headed by internal and external research teams.

4. BTNEP will utilize grant program to assist in the development of data collection protocols specific to invasive species.

1. **LOCATION**

This action will concentrate on locations throughout the BTES, but in order to prevent and control invasive species within the BTES, the program may address areas adjacent to the designated boundaries of the estuary.

1. **LEAD AGENCY RESPONSIBLE FOR IMPLEMENTATION**

BTNEP will be responsible for compiling primary data, species lists, results on control projects, and Summary Reports on efforts within the BT Estuary. However, as a component of that activity, it will also include results from other sources including numerous federal, state and local agencies, academics, and intergovernmental organizations doing projects involving invasive species. These include:

1. The U.S. Department of Agriculture (USDA) has a nation-wide Noxious Weed List. Species on that list cannot be imported into the U.S. except for some limited scientific research exemptions. They do not, however, regulate plant imports into Louisiana from other states.
2. The Animal and Plant Health Inspection Service (APHIS) of the USDA operates a Biological Control Program that studies, develops, and deploys biocontrol agents to protect agriculture and natural areas.
3. The US Geological Survey (USGS) maintains reporting and monitoring data and publishes factsheets and reports on its Nonindigenous Aquatic Species website.
4. USGS Wetland and Aquatic Research Center in Lafayette, LA maintains an active effort in studying and controlling invasive species.
5. The Bureau of Land Management, National Biological Service (NBS), National Park Service (NPS), USDA Agricultural Research Service, USDA Forest Service, USDA Natural Resource Conservation Service (NRCS), and the U.S. Fish and Wildlife Service (USFWS) have entered into a Memorandum of Understanding (MOU) for Federal Native Plant Conservation. The agreement sets up a committee to work with state and non-federal cooperators on native plant conservation on federal lands, including exotic species management.
6. The U.S. Army Corps of Engineers (USACOE) has been the leader in research and control of aquatic exotic plants. Continuation of their program, especially biological control research, is critical to the long term management of exotic plants in the BTES. The USACOE Aquatic Growth Control Unit works on biological, mechanical and chemical control of aquatic weeds in navigable waterways. In the past, they have participated in a 50/50 cost share program with the state to manage aquatic weeds in other water bodies. They have worked on selection and release of biocontrol agents in the region including the alligatorweed flea beetle, and the water hyacinth weevil, and the hydrilla fly.
7. The U.S. Fish and Wildlife Service (FWS) and National Oceanic and Atmospheric Administration (NOAA) oversee an invasive species program funded under the authority of the National Invasive Species Act. This Act created the Aquatic Nuisance Species Task Force to oversee the development and funding of individual State invasive species programs. The Louisiana Department of Wildlife and Fisheries (LDWF) has created an invasive species program, the Louisiana Aquatic Invasive Species Council and Task Force, using funding derived under this statute. This organization developed a state-approved Statewide Management Plan for Invasive Species in 2005, which is currently under implementation.
8. The US FWS also is responsible for oversight of the importation of invasive species under the authority of the Lacey Act. This act identifies a number of species as being injurious and regulates the import of such species.
9. Louisiana Department of Agriculture and Forestry (LDAF) enforces seed certification laws. It lists noxious weeds for different crops that cannot be present or only present in small amounts when the seeds are shipped.
10. LDWF maintains a noxious aquatic plant list. Plants on the list are cannot be imported into Louisiana. The list is in the fishing regulations pamphlet which is distributed to fishing license applicants. LDWF has developed brochures to educate citizens about the impacts of exotic plants and to encourage the use of native species when possible.
11. The LSU Cooperative Extension Service has weed scientists who are available to help land owners with noxious weed problems.
12. The Coastal Wetlands Planning, Protection and Restoration Act, while not developed to address the problem of invasive species, provides funds for the Coastwide Nutria Control Program, a project to control nutria populations in coastal Louisiana through incentive payments to hunters and trappers. Under this program, approximately 400,000 nutria have been eradicated annually in Louisiana’s coastal zone.
13. **TIMELINES AND/OR MILESTONES**

In part, as referenced here, the CCMP supports the implementation of the various plans developed by other agencies/entities. Each of those individual plans has their own specific timelines and milestones. Implementation of actions through the BTNEP Management Conference and financed through Section 320 funding are typically developed annually by various Action Plan Teams. These concepts typically involve partnerships/collaboration with various agencies/institutions; as such, many are considered opportunistic, not following specific timelines. Annual work plans developed through this process define timelines and milestones. Examples of possible plans and potential responsible parties are as follows:

*Education*

E.1 Produce a brochure for home/land owners explaining impacts from exotic species; provide a list of alternative native species for use in landscaping, aquariums and ponds. Emphasize the impacts from non-native species and the benefits of natives, such as opportunities to view more bird and butterfly species (LSU Cooperative Extension Service and USDA).

E.2 Develop an outreach program which identifies species of concern in the BTES. Identify cost-effective means to eradicate species based on geographic scope of removal area. Some eradication efforts may not be cost-effective over large areas but would be effective in smaller areas.

E.3 Support the establishment and funding of educational programs that highlight and encourage the control of a specific exotic species.

E.4 Develop species specific information sheets for the public that explain plant biology and least toxic management (LSU Cooperative Extension Service, USDA).

E.5 As part of education and interpretation, USFWS, NPS, and state parks can use exotic species programs, including tree removal and replanting with native species to inform the public, school and scout groups about impacts from exotic species (USFWS, NPS).

*Prevention and/or Control*

P.1 Identify legislation that regulates introduction of exotic species and urge the appropriate agencies to fully enforce those regulations. For example, LDAF could ban the sale of Chinese tallow trees in Louisiana.

P.2 Identify problematic species of concern to Louisiana where introduction of such species are not regulated. Recommend State legislation which would disallow the introduction and sale of those species in Louisiana.

P.3 Develop a noxious weeds law for LA that includes a noxious weed list making interstate import or transplant of invasive exotic species illegal within the state (LDWF responsible for compiling list; LDAF lead agency for listing terrestrial species).

P.4 Study noxious plant and exotic animal control program in Florida. Contact Exotic Pest Plant Councils in Florida, California and the Pacific Northwest to see if similar activities could work in Louisiana (USFWS, LDWF and NPS).

P.5 Study hydrilla biocontrol program in Florida to determine if it will work in Louisiana (USACOE, LDWF).

P.6 Support projects which eradicate or control exotic species. For example, BTNEP could encourage the continued funding of the nutria control program by CWPPRA, or new funding by CWPPRA of the salvinia weevil propagation program. BTNEP could promote projects to eradicate Chinese tallow trees at designated areas within the BTES.

P.7 Keep Louisiana noxious plant list updated (LDWF, USDA and LDAF).

P.8 Require all aquatic plants for sale to be native species; provide information about the impacts of aquatic exotic plants at pond and aquarium shops (LDAF, LDWF, LSU Cooperative Extension Service).

P.9 Develop biocontrol for other invasive exotic species (USACOE, USDA, LDWF, LDAF).

*Data Collection and Dissemination*

D.1. Identify a suite of recommended monitoring protocols, by species, for use in quantifying density of exotic species in various habitats within the BTES.

P.2 Set up a contact point where users can report infestations of new exotic weeds and new management techniques (LDWF and USDA).

D.3 Encourage the creation of a database to monitor and report effectiveness of eradication efforts within the BTES.

D.4 Designate areas of exotic infestation to use for demonstration of successful exotic species removal and native species replanting projects (USFWS, NRCS, NPS, USACOE, LDWF, LDAF).

D.5 Research a second biocontrol organism for water hyacinth (USACOE and LDWF).

D.6 Study biocontrol for Chinese Tallow Trees (USDA and LDAF).

1. **POSSIBLE RANGE OF COSTS AND SOURCES OF FUNDING**

As defined above, Lead Agencies/Entities are legislatively mandated to manage issues related to EM-16. Furthermore, each agency/entity develops annual budgets and programmatic budgets internally to address those legislatively mandated requirements. These budgets or discussion thereof are not presented here.

BTNEP as a co-lead implementer works with other lead agencies/entities on an annual basis to define projects, programs, and data gaps and develop partnerships with these organizations to address these. This includes an annual tiered process, first convening meetings of the BTNEP Invasive Species Action Plan Team (ISAPT) to discuss needs for a particular action plan project or program. Scopes of work are defined during this phase along with appropriate costs/budgets. These **c**osts vary according to the size and scope of the individual projects. As the process moves further, these project concepts and associated budgets are presented to the Management Conference where they are discussed and approved and included as part of individual BTNEP work plans. Funding sources vary, including CWA Section 320 funding. Other funding sources include but are not limited to the LDWF, and various other state and federal programs dealing with invasive species. Since the process of selecting projects to address invasive species issues is used annually, no reasonable expectation of costs can be presented beforehand.

1. **PERFORMANCE MEASURES**
   1. **Possible Data Gathered:**

State and federal resource agencies routinely conduct surveys to identify animal and plant species under various scopes of work that can be used to identify invasive species presence/absence. Examples include LDWF fish sampling, CRMS vegetative surveys, bird surveys, etc. BTNEP relies on these resource agencies’ efforts to supply data to inform project development. BTNEP also conducts its own surveys for tracking and presence/absence of various species, as well as contracting original scientific research specific to project goals.

* 1. **Monitoring:** 
     1. **Parties Responsible**:

See Section E.

* + 1. **Timetable for Gathering Data:**

Annual and special reports from state and federal agencies

* + 1. **How Data is Shared:**

1. Quarterly reporting of activity to BTMC at MC meetings

2. Document meetings and activities of the ISAPT

3. Regularly Reports to EPA

* + 1. **Possible Data Gaps:**

None identified.

* + 1. **If Additional Funding is Needed:**

Yes, as available.