9 Program Monitoring and Evaluation

This section lays out a strategy to monitor and evaluate the success of management plan execution over the next five years. Three questions emerge: who should do the evaluation, how, and when.

Who should do the evaluation? The Task Force decided to create an internal oversight board (or possibly a working group) within the to-be-established Council. This board would include at least one out-of-state, qualified professional to participate in the monitoring and evaluation. More external participants would be welcome but could be costly.

How should the evaluation be done? Recognizing the potentially high cost of a thorough assessment, the Task Force plans a three-fold approach to monitoring and evaluating the actions listed in this plan. The internal oversight board will be responsible for selecting and combining these three methods and applying them to specific goals and objectives.

a. Through the use of “indicator actions.” In this approach, evaluators select a representative group of actions as indicative of management plan progress. The degree to which those “indicator actions” acquire funding and are executed in their entirety is the degree to which success is declared. Advantages of this approach are that it is straightforward, inexpensive, and may be implemented in the early years of plan execution. The disadvantages are that it is based upon a small sample, does not address the larger issue of invasive species spread, and may not satisfy the public’s right to know the “bottom line:” are we better off now than when this effort commenced?

b. Through quantitative biological measures. In this approach, field work is conducted to answer questions such as:
   - Has the range of a particular species expanded?
   - Have new invasive species arrived?
   - Have ecological costs of the impact of certain species increased or spread?
   - Biologically speaking, is this problem greater than it was five years ago?

Advantages of this approach include its scientific and quantitative nature, and it addresses fundamental questions rather than bureaucratic ones. Disadvantages include its costliness, its highly focused nature (one species may contract in range while another may expand), and the need to wait until the end of the five-year cycle for actions to take potential effect. It may also be “setting the bar too high” to expect to control or eliminate certain species. Several monitoring programs are already in existence in Louisiana and may be considered by the internal oversight board as a method of gathering evaluation data. (See section 7, “Management Actions.”)

c. Through quantitative social measures. In this approach, surveys are conducted among stakeholders to answer such questions as:
   - Can you define the term “invasive species?”
   - Have you seen posted signs about invasive species at boat ramps and docks?
   - Do you wipe off your outboard motor and hull upon extracting it from the water?

For sections b and c above, graduate students should be encouraged to conduct these evaluations whenever possible.

When should the evaluation be done? Initial evaluations should be submitted at the end of years 1 and 2, and will probably be limited to the “indicator actions” approach. Deeper assessments should occur in the latter three years of the plan, when the biological and social quantitative methods should be employed, provided baseline data and funding are available. The Task Force may develop a “Performance Budget” funding request through the Louisiana Cooperative Extension Service or encourage universities in the state to develop research projects evaluating Task Force actions.

Details and the actual execution of program monitoring and evaluation will be left up to the internal oversight board, which will be responsible for a report to the Louisiana legislature every two years on progress, problems, and recommendations for plan improvement.
10 Glossary of Terms

Acclimatization — the process by which an introduced species and resulting offspring adapt to a new environment.

Aquatic species — all organisms living at least partially in a water environment. Usage commonly refers to aquatic plants such as water hyacinth and salvinia, fish, and invertebrates, but also includes mammals such as nutria. For purposes of the management plan, species that arrived through aquatic pathways (such as the Formosan termite) are considered aquatic species.

Baitfish — any species (fish, insect, invertebrate) sold for use as bait for recreational fishing.

Ballast — water or other matter placed in specific areas of the hull of a vessel for navigation stability. Species are often inadvertently transported in ballast water when it is released in another water body. In earlier years, rocks and metal bars were used as ballast material. In all cases, species can be transported inadvertently or purposefully in or on ballast material.

Ballast tank sediment — particles suspended in water pumped into ships for ballast that have settled to the bottom of the ballast tank. This sediment can harbor bottom-dwelling species that might be accidentally carried in a ship’s ballast water and subsequently released in a new environment.

Biocontrol — the use of living organisms to control other living organisms. It frequently involves the introduction of a non-native predator, herbivore, pathogen or parasite that interacts with the invasive species in its natural geographic range. An element of risk is associated with biocontrol methods. All possible impacts should be tested before adding a biocontrol agent to an ecosystem because the agent can produce a new economic or ecological problem. For example, introduction of grass carp to control aquatic weeds was too successful and the carp ate the native vegetation as well.

Control methods — chemical, mechanical, or biological methods to reduce the impact of invasive species. These methods may also be used to contain a species to stop its further spread.

Cryptogenic species — a species of questionable origin; can be native or non-native. Because humans have not kept a complete list of species by geographic location from the beginning of human life on the planet, there is no continuous, scientific record of all species and their original location(s) on earth. Those species for which the record of origin is questionable or unclear are labeled as cryptogenic.

Drainage basin — the catchment basin from which the waters of a stream, marsh, river, lake, or groundwater system are drawn. Smaller basins (such as Tangipahoa Basin) are nested with larger basins (such as the Pontchartrain Basin). In the deltaic portion of Louisiana, waterways such as the Mississippi River divide drainage basins, because their natural levees form the highest land in the area.

Dunnage — any packing material used to protect cargo from movement, moisture, contamination, or other damage. Dunnage such as straw and wood has sometimes served as media for species introduction in shipping.

Early eradication — the complete elimination of an invasive species from a specific geographic area at the beginning of the species’ colonization of that area. Early eradication is most likely to occur when the species is locally established and fairly contained.

Ecosystem — a community of organisms and their surrounding abiotica functioning as one unit.

Established species — a non-native species with a permanent, reproducing population that is unlikely to be easily eliminated through human action or natural causes. Established species may or may not be invasive (environmentally or economically problematic).
**Exotic species** — a species that is not native to a designated ecosystem or geographic area. Synonyms include nonindigenous, non-native, foreign, and alien species. Because some exotic species may be harmful or invasive while others are not, this term should be used with great care.

**Freshwater species** — aquatic species native to freshwater.

**Indigenous species** — organisms naturally occurring in a specific geographic area or ecosystem. Synonym includes native species.

**Introduced species** — an organism that is not native to a designated ecosystem or geographic area.

**Invasive species** — non-native organisms whose introductions cause or are likely to cause adverse environmental, economic, and/or human health impacts. For purposes of the management plan, synonym is nuisance species.

**Habitat** — area where a species has the necessary food, water, shelter, and space to live and reproduce.

**Localized population** — a reproducing population of introduced organisms that is confined to a particular area. Possibility for eradication is increased when the organism is contained.

**Locally established species** — a number of localized populations; that is, a non-native organism with one or more reproducing populations within a limited range, with no geographic expansion yet. An example would be the Rio Grande cichlid. It is locally established on the south shore of Lake Pontchartrain and in the connecting drainage canals.

**Marine species** — aquatic species native to saline waters.

**Media** — natural and man-made materials infested or utilized by species as they are transported (accidentally or deliberately) to new locations. Media might include ballast water, shipping/packing materials, wholesale products, cargo, equipment, people, parts of railroads, airlines, ships, outboard motors, runoff and effluent.

**Monitor** — to watch, observe, or check for a special purpose. For purposes of the management plan, observing or checking activities based upon scientific method to accumulate data about aquatic invasive species and their environs.

**Native species** — synonym of indigenous species.

**Naturalization** — the creation or occupation of an ecological niche by an introduced species; occurs after acclimatization.

**Nuisance species** — a plant or animal pest. For purposes of the management plan, these are non-native species that threaten the diversity or abundance of native species or the ecological stability of infested waters, or commercial, agricultural, aquacultural, or recreational activities dependent on such waters.

**Parasite** — an organism living in or on another organism.

**Pathogen** — a specific agent causing disease. May be a bacteria, virus, or fungus.

**Pathway** — geographical features or patterns by which species are physically transported to new areas. A pathway might be a shipping lane, highway, river, current, wind, trade route, or waterway. Pathway combined with media result in a vector.

**Pioneer infestation** — a small colony of an invasive species that has spread to a new geographic area from an established population.
Rapid response — fast containment, control and eradication of an initial invasion.

Regulation — a rule or order having to do with details or procedures and having the force of law.

Screening — process for examining imported cargo/products and deliberately transported species to prevent transport of invasive species.

Species — a fundamental category of taxonomy, ranking below genus and subgenus, consisting of related organisms capable of inbreeding.

Terrestrial species — organisms living primarily on land.

Vector — transportation of a species on or in a media through a pathway. Vector is a combination of the concepts of “media” and “pathway.”

Veliger — larval form of some mollusks, including the invasive species zebra mussels.

Watershed — according to the USGS, “watershed” refers to the dividing ridges separating drainage basins, but recent usage has made it practically synonymous with drainage basin.
11 Literature Cited


Cashner R. Personal communication on 7 March 2001. University of New Orleans, Department of Biology, New Orleans, Louisiana.


Dugas CN. Personal communication on 2 April 2003. Louisiana Department of Wildlife and Fisheries, Aquatic Plant Research and Control Section, Baton Rouge, Louisiana.


Frey P. Personal communication on 27 January 2003. Louisiana Department of Agriculture and Forestry, Baton Rouge, Louisiana.

Gaudé AP. Personal communication on 11 December 2002. Louisiana State University AgCenter, Baton Rouge, Louisiana.


Hicks DW. Personal communication on 20 February 2003. Texas A&M University, Corpus Christi, Texas.


Howells RG. Personal communication on 20 February 2003. Heart of the Hills Fisheries Science Center, Texas Parks and Wildlife Department, Ingram, Texas.


Kelso WE. Personal communication on 10 March 2003. Louisiana State University Agricultural Extension, Louisiana State University, Baton Rouge, Louisiana.


LDWF. 2002e. Motorboat Registration: Number of Active Boats as of Current Date — December 31, 2002. Louisiana Department of Wildlife and Fisheries, Fiscal Division, Baton Rouge, Louisiana.


*Louisiana Revised Statutes* §328, Subsection B.


Miller AW. Personal communication on 18 March 2003. Smithsonian Environmental Research Center, Edgewater, Maryland.


O’Connell MT. Personal communication on 14 March 2001. University of New Orleans’ Department of Biological Sciences, New Orleans, Louisiana.

O’Connell MT. Personal communication on 15 May 2003. Department of Biology, University of New Orleans, New Orleans, Louisiana.


Power AJ. Email communications to Aliens-L listserve on 7 and 23 October 2003. Marine Extension Service, University of Georgia, Athens, Georgia.


Rick JJ. Personal communication on 1 April 2003. University of Louisiana – Lafayette, Department of Biology, Lafayette, Louisiana.


Stoeckel JA, Charlebois PM. 1999. Daphnia lumholzti: The Next Great Lakes Exotic?. Illinois – Indiana Sea Grant College Program at Purdue University and the University of Illinois Urbana-Champaign,


State Management Plan for Aquatic Invasive Species in Louisiana


