Game camera used to monitor meso-mammals

Chapter 7
Monitoring and Adaptive Management

Determining the effectiveness of conservation actions and reducing the threats facing the District's natural resources will be tracked through a monitoring program which focuses on indicators of success for conservation targets (see Table 32). Indicators of success will be used to assess the status of those conservation targets. The monitoring program will also be used to determine if a conservation action was not only successful, but economically efficient. Adaptive management techniques will be implemented as conditions change to improve chances for the long-term conservation of natural resources and achieving SWAP goals.

For our purposes adaptive management is defined as "adjusting the type, frequency or intensity of management techniques based on the observed effects of previously implemented management techniques, based on feedback from monitoring the original and managed state of the target species, habitat or area". Monitoring, research, and assessment studies of wildlife populations and habitat condition are integral to an adaptive management framework. New information can also be gleaned from credible scientific sources. Conservation strategies must be periodically reevaluated and adjusted to ensure that conservation and management strategies and practices meet long-term goals.

For many SGCN there was insufficient local data to quantitatively and confidently assess their status, monitoring protocols have not yet been developed, or DOEE lacks the expertise or resources to monitor them. DOEE and other partners will strive to inventory and monitor species with data gaps, and assign conservation targets and indicators for success for these species in the future. As these data gaps are filled, more relevant and specific monitoring regimes can be developed.

7.1   Planned Monitoring and Adaptive Management

The District will use multiple tools for information management and tracking conservation efforts, including; the Northeast Regional Monitoring and Performance Reporting Framework (NRMPRF), Northeast Lexicon Project, and USFWS-TRACS. Conservation actions will be monitored and measured throughout the 10-year implementation of SWAP 2015.

The NRMPRF is a collaborative effort of states in the Northeast, federal land management agencies, NGO's, and academics to assist in the meeting of monitoring and performance reporting requirements for SWAPs. The Northeast Lexicon is a regional conservation lexicon that can be used by the District and other state agencies and partners to define conservation projects. This uniformity will allow for greater communication and synergy across the region. TRACS is a federal reporting tool that tracks project outputs, effectiveness measures, and species and habitat incomes through a UWFWS database. TRACS has the ability to track short-term measures and long-term outcomes for species and habitats. TRACS contains classifications for threats and conservation actions that are associated with the IUCN system.

Table 32 Identified Conservation Targets and Indicators of Success

Conservation Target Example	Indicators of Success
Invasive Species Management	Number of invasive plants considered established
	Number of established invasive plants removed
	Number of invasive plant surveys conducted
	Number of recreational users contacted
	Number of active volunteers trained
	Acres revegetated with native plants
	Area of insect infestation mapped and inventoried
	Number of infested trees mapped and inventoried
	Number or area of trees and plants treated
	Number of new invasive fish considered established
	Number of established invasive fish removed
	Area of aquatic habitats surveyed for invasive fish
	Number of invasive fish tagged for study
	Habitat quality metrics

Conservation Target Example	Indicators of Success
	Target species population metrics
	Outreach and education initiatives implemented
	Number of citizens trained to a specified competency
	Number of artificial nesting structures
Water Quality: Urban Wastewater, Sedimentation, and Nutrification	Number of acres of impervious surface managed
	Number of gallons of stormwater retained/treated
	Number of CSO events eliminated
	Reduction in floating trash on receiving waters
	Number of feet of streams altered/restored
	Population metrics of SGCN in stream restoration projects
	Acres of critical habitat restored or created in association with stream restoration projects
Problematic Native Species	Percent reduction in density of whitetail deer
	Percent reduction in density of summer resident Canada geese
	Wetland acres revegetated with native plants
	Habitat quality metrics
	Target species population metrics
Recreational Activities and Infrastructure	Enforcement initiatives implemented
	Number of miles of social trails eliminated
	Number of acres of wildlife habitat with increased connectivity
	Outreach and education initiatives implemented
Ecosystem modifications	Acres of groundwater-fed wetlands restored
	Number of vernal pools created/restored
	Target SGCN population metrics
	Acres of critical habitat restored or created in association with stream restoration projects
	Number of feet of streams altered/restored
	Habitat quality metrics
	Forest regeneration
	Number of acres of impervious surface removed in channel removals
Inventory and Monitoring	Number of surveys directed toward SGCN
	Number of research projects directed toward SGCN
Diseases and Pathogens	Number of decontamination protocols implemented District-wide
	Number of monitoring protocols implemented
Endocrine Disruption	Decreases in levels of endocrine disruptors found in species
	Decreases in levels of endocrine disruptors found in water bodies
Light Pollution	Number of buildings participating in light reduction programs
	Number of buildings participating in light-reducing LID strategies
	Percentage of street lights employing light pollution reduction technology

Conservation Target Example	Indicators of Success
Collisions with Glass and Buildings	Reduction in number of building/window strikes
	Number of buildings participating in bird friendly design programs
	Number of buildings implementing LEED pilot credit PC #55: Bird Collision Deterrence
Meadow Restoration	Number of acres of meadow restored or created
	Increase in grassland/meadow habitat associated SGCN populations
Tidal Wetland Restoration	Number of acres of tidal wetlands restored or created
	Increase in tidal wetland associated SGCN populations
Native Plant Propagation	Number of attendees to native plant propagation training classes
	Number of plants produced by native plant nursery
	Number of habitat restoration projects utilizing plants from native plant nursery
Vernal Pool Creation	Number of acres of vernal pools restored or created
	Increase in vernal pool habitat associated SGCN populations
Artificial Nesting Structures	Number and type of nesting structures installed
	Number of nesting structures utilized by target species
	Number of successful nesting attempts by target species in artificial structures
Trustee for Natural Resources	Introduction and passage of species protections
	Number of acres under management as habitat
Citizen Science Program	Number of participants in citizen science programs
	Number of species accounts collected through citizen science programs
Wildlife Corridors	Number of collision records collected
	Number of hotspots identified
	Number of preventative measures taken
	Number of new roads with wildlife crossings
	Number of new roads or other infrastructure in existing habitats

7.1.1 Ongoing Species Monitoring Programs

There are numerous monitoring programs in the District with a goal of monitoring individual wildlife species and important taxa such as winter waterbirds or obligate vernal pool species. Existing programs are the primary method that DOEE and other wildlife agencies use to monitor and track SGCN. Data from these programs are collected and reported to wildlife managers at state agencies and nearby federal and nonprofit partners. This information will be used as feedback to inform adaptive management of important wildlife populations.

▪ Nightjar Survey

- Striped Bass Passive Integrated Transponder Tagging

- Shad Propagation

- Ultrasonic Fish Tag Survey

- Electrofishing and Pushnet Surveys

- Macroinvertebrate Surveys

- American Eel Survey

- Canada Goose Survey

- Whitetail Deer Population Survey

- Christmas Bird Count

- Winter Waterbird Survey

- Bee Surveys

- Breeding Bird Survey

- Brent Elementary Winter Bird Count

- Bat Mist Netting and Acoustical Monitoring

- Box Turtle and Spotted Turtle Radio Telemetry

- Frog Call Surveys

- Cover Board Surveys

- Amphibian Egg Mass Surveys

- Lotic Dipnet Surveys

- Aquatic Turtle Trapping

- Small Mammal Trapping

- Meso-mammal Camera Traps

- Flying Squirrel Nest Boxes

- Osprey Nest Monitoring

- Bald Eagle Nest Monitoring

- Eastern Cottontail Citizen Science Survey

- Lepidoptera Transects

- Odonata Transects

DOEE wildlife biologist Daniel Rauch

Marbled salamander

7.1.2   Ongoing Habitat Monitoring/Restoration Programs

- SAV Surveys

- Anacostia Watershed Society Rice Ranger Wetland Restoration Project

- Anacostia Watershed Society Phragmites Monitoring

- Anacostia Watershed Society Freshwater mussel Surveys

- Non-Migratory Canada Goose Survey

- Whitetail Deer Population Survey

7.2   Potential New Monitoring/Restoration Programs

- Pre- and post-construction monitoring of stream restoration projects

- Native plant propagation

- Fate of propagated native plants used in habitat restoration in meadows, forests and wetlands

- Meadow creation in currently mowed grassy areas

- Citizen Science Programs

7.3   Important Data Gaps

Through monitoring efforts, data has been gathered for less than 500 species in the District. This includes a small percentage of the number of invertebrates which have been identified. The data gaps for the population status and trends for gastropods, mollusks, crayfish, bees, and sponges will be addressed through the life of SWAP 2015.

Invertebrate survey needs include the following:

- Crayfish

- Mussels

- Freshwater and Terrestrial Snails

- Copepods and Amphipods

- Bees

- Freshwater Sponges

- Arachnids

- Beetles

- Moths

7.3.1   Partner coordination for Data Gaps

- Anacostia Watershed Society (mussels)

- American University (copepods and amphipods)

- NPS, George Washington Memorial Parkway and Howard University (snails)

- NPS, George Washington Memorial Parkway (beetles)

- NPS, USGS, and George Washington University (bees)

- NPS-Center for Urban Ecology (sponges)

7.4   Periodic Plan Review and Revision

By tracking indicators of success and other effectiveness measures, needed information will be gathered to adaptively manage natural resources in the District. If monitoring and adaptive management techniques identified in this SWAP are not adequate to the whole or parts maybe be revised to conserve SGCN and their habitats.

Similarly, in order for the SWAP to remain relevant, periodic review and revisions may be necessary. The emergence of new threats, discovery of extirpated species, or as habitat related changes occur, the plan must be amendable to address these changes. Performance measures should be selected that are realistic and translate to USFWS's Wildlife TRACS. The current SGCN list will be revisited and, if needed, revised in no more than five years after the submittal of SWAP 2015.