CHAPTER 5
MONITORING

Introduction

Monitoring Alabama's SGCN, their habitats, and the effectiveness of the conservation actions identified in this SWAP is important and necessary information for ADCNR WFF and its partners (**Element 5**). It provides the opportunity to determine the effectiveness of conservation actions and to reduce and eliminate threats facing the state's fish and wildlife resources. Monitoring is also necessary to track the success of conservation actions, ensuring the most efficient use of limited staffing and funds. As conditions change (e.g., land use patterns, severe weather events, global or national population trends, new data and information), adaptive management and implementation of the conservation actions identified in this Chapter will allow WFF to respond appropriately. This Chapter describes how the WFF will potentially use tools for information management and conservation planning to track the implementation and effectiveness of conservation actions. Tools include the State Wildlife Grants Effectiveness Measures Project (AFWA 2012) and the national Tracking and Reporting Actions for the Conservation of Species (TRACS) database. Conservation actions will be monitored and measured throughout the 10-year implementation of the SWAP.

State Wildlife Grants Effectiveness Measures

The Association of Fish and Wildlife Agencies (AFWA) led the effort to develop an approach for measuring the effectiveness of wildlife conservation activities funded under the USFWS's State Wildlife Grants (SWG) program. In 2017, AFWA's Teaming with Wildlife Committee formed the Effectiveness Measures Working Group. This working group included representatives from state fish and wildlife agencies as well as private, academic, and non-governmental conservation partners with expertise in wildlife conservation and performance management. In 2017, the working group released a final report that outlines a comprehensive approach to measure the effectiveness of the activities funded under the SWG program. The report recommends a set of common indicators for measuring status, trends, and/or effectiveness of thirteen general types of conservation actions that are commonly supported by SWG.

TRACS Database

Tracking and Reporting Actions for the Conservation of Species (TRACS) is the tracking and reporting system used by the U.S. Fish & Wildlife Service (USFWS), Office of Conservation Investment (OCI) program to capture conservation and related actions funded by its grant

programs. TRACS provides real-time public access to project information, including project descriptions and accomplishments (https://tracs.fws.gov/performance/grants/2109741/workflow). Table 5-1 outlines the TRACS performance matrix with defined objectives and activities.

Alabama's Monitoring Framework

Alabama's monitoring strategy uses the SWAP conservation ranks and actions to guide monitoring of SGCN, key habitats, and the results of conservation actions (**Chapter 4, Element 4**). Adaptive management is a useful mechanism that will be used to continually improve Alabama's conservation of SGCN and key habitats by incorporating lessons learned from successful and unsuccessful management actions.

Monitoring connects the implementation of conservation actions with management objectives. Implementation of this SWAP involves monitoring at a variety of geographic scales, including local, state, regional, and national, according to their appropriateness and the recommendations of relevant partners' plans and programs. Standardized monitoring protocols, such as those of the Breeding Bird Survey, International Shorebird Survey, North American Bat Conservation Partnership Strategic Plan, and American Fisheries Society, will be utilized wherever appropriate so that Alabama's data will be compatible with regional and national conservation efforts. Alabama's monitoring strategy also incorporates different time scales (short-term and long term) to monitor the implementation and effectiveness of conservation actions and the status and condition of key habitats. In the short-term, the monitoring strategy evaluates whether the conservation actions were successful in improving the status and/or condition of SGCN and key habitats. Long-term objectives track the abundance and distribution (both historic and current) of key habitats and the SGCN they support, their condition and conservation status, and to adaptively manage to achieve desired goals. Monitoring SGCN and Key Habitats Monitoring is to be accomplished at various biological levels, including individual species, guilds, or natural communities. Plans for monitoring SGCN and their key habitats are listed under the Priority Research, Survey and Monitoring Needs sections for each habitat in **Chapter 4, Element 4**. Within each habitat, the most appropriate level of monitoring has been identified and prioritized by the Taxa Team experts. Wherever possible this SWAP recommends and supports the full implementation of partners' plans that have recommended or identified standardized monitoring actions. In cases where not enough information exists to monitor a species or group, or monitoring protocols have not yet been developed, this need is documented and followed by a conservation action to address that information need. An integral part of WFF's conservation efforts is monitoring the changes in species and habitats over time, especially in response

to conservation actions and threats. AWFF and other conservation partners conduct species, habitat, and performance monitoring annually.

Status monitoring is a critical component of fish and wildlife conservation. It provides information on species and habitat status, response to conservation actions, and vulnerability to current or future threats (e.g., extreme temperature changes, sea level rise, disease, or human development), and is the basis for adaptive management in conservation. This section outlines how status monitoring of SGCN and habitats is currently conducted at the statewide scale. To evaluate the status of a species, it is necessary to monitor population size, population trends, area of occupancy, and/or extent of occurrence, with various monitoring approaches. For some, monitoring protocols do not exist, or the protocol is not standardized, so research into appropriate and effective techniques is needed. Other SGCN (especially P3s) are poorly known, and basic surveys must be conducted to understand the species' status. The monitoring approach determined will provide sufficient data to evaluate the species' biological status. Monitoring approaches will be standardized to be consistent as across taxa communities, where possible.

The status and trends of individual SGCN will be tracked by complementing the existing State Lands Division Natural Heritage Section (SLD-NHS) database. The database includes 5 million species occurrence records for flora and fauna in Alabama, with information such as protection status (federal and state), rankings (SGCN), and Natural Heritage System (NHS) scores. The status and ranking of a species are updated on an as-needed basis. The database has a website used by researchers and scientists doing work in Alabama (https://heritage.dcnr.alabama.gov). The scientific collection permitting system has been linked to the database since 2009. For a researcher to renew their permit each year, they must submit the previous year's data into the database. From the website, users can also query the database for a particular species, species group, or geographic area of interest. The database includes information from protected and unprotected lands, public, and private lands. The database is a clearinghouse and contains data collected by ADCNR personnel, other state agency researchers, academics, and the general public. All data includes a citation, which allows the user of the data to ask additional questions to the collector of the data and gives credit to the collector. In addition to this reporting system, WFF has a Black Bear Observation reporting system that is supported by citizen science reporting https://game.dcnr.alabama.gov/BlackBear. Black bear sightings are on the rise in Alabama and many reports are called in to the WFF District offices. This reporting system adds valuable monitoring data to observe distribution and road mortalities.

Habitat monitoring provides information on the status of the habitat in relation to the desired future condition, which can include persistence of certain fish and wildlife species (Rowland

and Vojta 2013). To evaluate the status of the habitats identified in this SWAP, vegetation structure and composition and trend in condition over time should be monitored. Measuring the vegetation structure and composition of a habitat type statewide is resource intensive. Geographic Information Systems (GIS) are used to monitor land use and conversion and delineate habitat classes. Monitoring the status and/or condition of key habitats will be accomplished primarily through existing monitoring programs, including GAP and Strategic Habitat Units (SHUs) and Strategic River Reach Units (SRRUs). Periodic updates of the land use and land cover in the state will allow the abundance and distribution of each habitat to be monitored as conservation actions and SWG projects are implemented. Areas where additional efforts are needed will be identified and adaptively incorporated as the SWAP is updated.

Effectiveness of Conservation Actions

The purpose of tracking effectiveness measures is to obtain the information needed to adaptively manage fish and wildlife species and habitats in the state. The next sections of this chapter describe a conceptual model for the SWAP, with corresponding results chains, and illustrate how the SWG effectiveness measures function within an adaptive management context. The effectiveness of conservation actions described in this SWAP will be measured using a set of standardized effectiveness measures that have been developed by AFWA and described in their 2011 Measuring the Effectiveness of State Wildlife Grants Final Report (AFWA 2011). Actual values for these measures will be entered into the USFWS Wildlife TRACS database, and comparisons of the values of these measures over time will be used to establish the degree of effectiveness of individual projects as well as broader conservation programs. Terms and standard definitions are derived from Margoluis and Salafsky (1998) and Salafsky et al. (2008).

The Alabama State Wildlife Action Plan Conceptual models are at the heart of adaptive management approaches for species and habitat conservation. Models illustrate what is called the “theory of change” for a project: the causal pathways by which managers believe that a project will achieve its desired results. Although there are many different kinds of conceptual models, Margoluis and Salafsky (1998) introduced a simple form of box-and-arrow diagram that shows causal linkages between the basic conservation elements for an individual project, including targets, threats, and conservation actions. While originally developed as a tool for developing individual conservation projects, conceptual models can also be developed for a larger conservation program. The conceptual model for the SWAP illustrates the linkages between the core plan elements, including species and habitats, threats and actions. This conceptual model is intended to be a generalized representation of the interactions between the plan elements. Not all the threats and actions shown in the

diagram will apply to every species or habitat. What the diagram shows is the set of possible threats and actions that could affect a particular species or habitat.

Measuring SWAP Success

The SWAP planning team will continually assess the status of each conservation action. Accomplishment measures may include tracking the acres/stream miles of habitat protected or improved through various means (i.e., acquisition, conservation easements, restoration, or enhancement), biological assessments of SGCN, research to fill data gaps, monitoring programs, information management, funding of conservation projects, and outreach to partners and the public. The ability of the conservation actions to address the needs of the fish and wildlife resources of Alabama will be monitored qualitatively. An improvement in the coordination of similar monitoring projects conducted by disparate sources would be one such qualitative measure. Coordination of all the avian monitoring projects, for example, through regional resources such as the East Gulf Coastal Plain Joint Venture Plan, would enhance the efficiency of each project. This would lead to a qualitative improvement towards successfully implementing the SWAP goals and objectives for avifauna. Another qualitative measure of monitoring success may be the increased involvement of WFF in other statewide or regional conservation initiatives. By utilizing both quantitative and qualitative success criteria, the WFF will be responsive to the diverse nature, scope, and scale of the SWAP conservation actions. The status of implementing the conservation actions will be reviewed periodically by WFF staff and experts to determine when the success criteria are not being met and adaptive management measures are needed. The WFF staff and other experts/partners will identify and implement appropriate revisions to the conservation actions. This will be completed as often as necessary, as the effectiveness of the conservation measures will be measured on various time scales depending on their scope and duration.

Important Data Gaps in Alabama

With the finite resources available to support monitoring programs, it is simply not possible to monitor many aspects of the natural or human environment relevant to fish and wildlife conservation efforts. However, it is possible to identify high-priority target areas where additional data would be helpful for developing management prescriptions for fish and wildlife species and their habitats in Alabama. Chapter 3 & 4 identify the high priority data gaps identified by taxa experts, planners, and stakeholders through the SWAP review process. WFF plans to work with partners to develop monitoring programs to address these gaps including species, taxa, habitat, health and community-level monitoring. This will be an important step towards providing wildlife managers in Alabama with the information they need. WFF proposes to complete a comprehensive revision of the SWAP in ten years, and to

review, evaluate, and update sections annually through the existing program reporting system and grant administration. The USFWS requires establishment of procedures to review the SWAP at intervals not to exceed ten years. WFF will comprehensively revise this SWAP again by 2035. To adequately prepare for this 10-year revision, WFF will sponsor workshops and symposia as needed and utilize this extensive scientific review and update of SGCN, key habitats, and conservation actions as the foundation for the next SWAP. Committing to such a significant effort indicates that WFF will continue to involve its many conservation partners and interested stakeholders in the SWAP development. Each ADCNR division/program has a set operational timeframe for program evaluation and reporting. For example, the existing Wildlife and Sport Fish Restoration program process requires annual reporting, input into the Wildlife TRACS database, and a 5-year review of work plans and evaluations. The Fisheries, Nongame and Wildlife Sections of WFF, as well as most other ADCNR agency programs, have annual reporting requirements from their grant funding source. Perhaps the most efficient and effective outcome of this SWAP will result from the SGCN, key habitats, and priority conservation strategies being actively integrated into the revision processes of WFF and its many partners' plans and program. This effort alone produces the ripple effect for conservation efforts across the state, providing a consistent and unified approach for conservation of Alabama's wildlife. An iterative, adaptive process will require the incorporation of research results, monitoring and surveys that provide for refinement of the priorities and actions of this plan. Each revision of this SWAP document and conservation partners' planning documents should reciprocally integrate the updates of partners' plans. This will ensure that each revision includes the most current scientific and administrative information for the key conservation partners in the state and institutionalizes these important coordination and revision efforts. Over the next ten years, WFF will implement conservation actions and monitoring identified in Chapters 4 and 5.