

Southeast Coast Network

National Park Service
Inventory & Monitoring Program



Standard Operating Procedure (SOP) #1.4.23

Herpetofauna Identification Training for Field Staff

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Summary

This Standard Operating Procedure explains the training and evaluation procedures for all field staff implementing visual-encounter surveys or analyzing data collected by the automated recording devices as part of the vocal anuran monitoring or other herpetological studies in Southeast Coast Network parks. The identification skills of all field staff are confirmed prior to data collection. The goal of the training is to ensure the field staff can identify all species accurately and to eliminate or minimize the introduction of this form of non-sampling error into the dataset. The training techniques and materials described in this SOP have proven to be very effective by the SECN with seasonal personnel that have an educational or experiential foundation in natural resources, or comparable background, with little or no field experience.

Revision Log

Previous Version #	Revision Date	Author	Changes Made	Reason for Change	New Version #
1			Minor edits	Publication of amphibian protocol	1.1

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Overview

Species-identification training begins at least two months prior to the beginning of the field season. Because SECN parks are known to host 61 amphibian species (i.e., 35 species in Anura, 26 species in Caudata), it is imperative that an adequate amount of training time for identification is planned and utilized to ensure accurate identification and minimize this potential source of non-sampling error. Further, although not the focus of the amphibian community monitoring protocol, all reptiles detected as part of the visual-encounter surveys are also identified and recorded. Consequently, identification training is also necessary for the 108 reptiles (one species in Crocodilia, 74 in Squamata, and 33 in Testudines) known to occur in SECN parks. The field season begins in March; therefore, seasonal staff begin training in January to ensure an adequate amount of time exists to provide proficiency in species identification. The Wildlife Biologist or the Terrestrial Ecologist determines the extent to which field personnel require training, supervise the training, and evaluate the acquired knowledge base. Despite their experience or background, identification skills of all personnel are evaluated. The Wildlife Biologist leads in the training activities by providing the training materials, guiding the lessons, sharing identification tips, answering questions, identifying subject areas in which personnel need further development, organizing local field trips for “live” identification exercises, and ensuring the identification skills of the field staff are proficient, reliable, and defensible prior to the commencement of data-collection activities.

It is important to note that a keen search image is a key characteristic for the field staff, which is not necessarily an ability that can be learned in two months. Amphibians are well camouflaged and staff with no experience or background searching for animals, plants, etc., are likely to fail to detect species present in the sampling locations. Although the Wildlife Biologist and Terrestrial Ecologist provide the field staff with tips on improving and honing detection ability, it is the responsibility of the Wildlife Biologist to be aware of each member of the field team’s limitations and adjust accordingly by providing slightly more oversight until their search image is honed (e.g., provide for some overlap in the search area during the visual-encounter surveys that the Wildlife Biologist surveys as well).

During the learning process, field staff are also required to justify “why” an animal is identified as one particular species as opposed to another. Listing and describing specific characteristics of a species compared to other species indicates a working knowledge of the species likely to be encountered by the team.

Despite a well-trained and dedicated field crew, complete identification of all individuals encountered is not always possible due to the quick and evasive nature of many species. All species, however, are identified to the most refined taxonomic level possible. Two factors are the most common challenges: animal-escape behavior, and variability of identifying or discriminating characteristics within some genera. First, animal-escape behavior is expected when the observer crosses a particular distance threshold from an individual. As expected, this threshold varies substantially, not solely by species but also by the individual and their own experiences. Escape action by one individual in a group often triggers escape of the remaining members of the group. In situations where animals escape before an accurate identification is made, identification of these species ascends the taxonomic hierarchy to a level that is accurate. For example, the surveyors are approaching a small pool surrounded by dense vegetation and

they catch brief glimpses of and hear several frogs dive into the pool prior to completing a full visual inspection of the individuals necessary for identification. Although the majority of these species could most likely be identified to the genus or family level (i.e., “Unknown *Lithobates* sp.” or “Unknown Ranidae” in this instance) based upon knowledge of the site and the local fauna, a conservative estimation is used and these individuals are identified to Order as “Unknown Anura”. Secondly, some species of the same genus are very similar in appearance or are highly variable in appearance. Occasionally, this is further confounded by overlapping ranges of these species of similar appearance. For example, northern cricket frog (*Acris crepitans*) and southern cricket frog (*Acris gryllus*) are very difficult to distinguish in parks where their ranges overlap (e.g., CONG, HOBE, OCMU). Some *Desmognathus* species can also present a similar challenge. While reliable identification can be obtained for most of the species through physical characteristics or range discrimination, pooling to genus or group in the aforementioned situations, although uncommon, ensures consistency and does not adversely affect our knowledge of the site because these species are likely functionally, ecologically, and measurably indistinct in areas where they coexist.

Training Materials

The training materials consist of various resources. These include the SECN field guide which includes detailed descriptions, range maps, and images, internet resources listed below, PowerPoint presentations prepared by SECN staff, reference books listed below, dichotomous keys (Powell et al. 1998), a vocalization library of audio files, and identification tips from experts and our experience.

The materials outlined below are not presented in any order of preference or utility by the authors; all of these resources have proven very useful and are part of the training regimen.

Southeast Coast Network Products

- (Draft) Field Guide for Amphibians in National Parks of Southeast Coast Network Inventory and Monitoring Network
- Species Lists
 - Up-to-date, certified, and official species lists are available for free download from the National Park Service's Integrated Resource Management Application (IRMA).
 - URL - <https://irma.nps.gov/App/Portal/Home>
- PowerPoint Presentations
 - Dynamic content, developed each year specifically for parks on that year's monitoring rotation and based upon the experience of staff.
 - Focuses solely on visual identification and contains only an image of each species known or likely to occur at the parks on that year's rotation, the scientific name, and the common name.
 - Stored on SECN servers.
 - Contains SECN images and non-NPS images used with permission but not available for release.
- SECN Call Library
 - Compilation of Anuran vocalizations from commercial and internet sources.
 - Excerpts of recordings from automated recording devices.

Audio Resources

- USGS Patuxent Frog Call Lookup and Public Quiz
 - o URL - <http://www.pwrc.usgs.gov/frogquiz/index.cfm?fuseaction=main.lookup>
- North American Amphibian Monitoring Program (NAAMP), Frog and Toad Calls Website for Georgia
 - o Site administrator: J. C. Maerz, Wildlife Ecology and Conservation Management Program, Warnell School of Forestry and Natural Resources, The University of Georgia, Athens, GA.
 - o Recordings donated to NAAMP and Georgia Department of Natural Resources by W. W. Knapp.
 - o URL - <http://jcmaerz.myweb.uga.edu/lab/GANAAMP/index.htm>
- The Calls of Frogs and Toads, by Lang Elliott
 - o For purchase only, URL - <http://www.amazon.com/Calls-Frogs-Toads-Lang-Elliott/dp/0811729680>
- Dorcas, M. E., S. J. Price, J. C. Beane, and S. C. Owen. 2007. The Frogs and Toads of North Carolina: Field Guide and Recorded Calls. North Carolina Wildlife Resources Commission, Raleigh. 80 pp. and CD.
 - o For purchase only, URL - http://216.27.39.101/NCWildStore/Frog_Call_Product.htm

Books and Guides

- Field Guide for the Amphibians of Southeast Coast Network National Parks, Draft.
 - Byrne, M. W., E. P. Davie, D. M. Lagana, L. E. Elston, and B. D. Smrekar. *In review*. Field guide for the amphibians of Southeast Coast Network National Parks, Draft. Southeast Coast Network, Athens, GA.
 - Detailed descriptions, images, range maps
- Tadpoles of the Southeastern United States Coastal Plain (Amphibian Research and Monitoring Initiative)
 - Gregoire, D. R. 2005. Tadpoles of the Southeastern United States coastal plain. United States Geological Survey Report. Florida Integrated Science Center. 60 pp.
 - Images (tadpole and adults), descriptions, measurements, morphology, species comparisons.
 - URL - http://fl.biology.usgs.gov/armi/Guide_to_Tadpoles/guide_to_tadpoles.html
- A Key to Amphibians and Reptiles of the Continental United States and Canada, 1st edition
 - Powell, R., J. T. Collins, and E. D. Hooper, Jr. 1998. A key to amphibians and reptiles of the continental United States and Canada, 1st edition. University of Kansas Press. 160 pp.
 - Dichotomous keys, drawings, definitions.
- Salamanders of the United States and Canada
 - Petranksa, J. W. 1998. Salamanders of the United States and Canada. Smithsonian Institution Press, Washington DC. 587 pp.
 - Detailed descriptions, images, range maps, dichotomous keys.
- Mitchell, J., and W. Gibbons. 2010. Salamanders of the Southeast. University of Georgia Press, Athens. 324 pp.
 - Extensive descriptions, life history, range maps, images.
 - Most up-to-date text available on species ranges and descriptions.

- Jensen, J., C. D. Camp, W. Gibbons, and M. J. Elliott, eds. 2008. *Amphibians and Reptiles of Georgia*. University of Georgia Press. Athens, GA. 600 pp.
 - Extensive descriptions, life history, range maps, images.
 - Most up-to-date text available on species ranges and descriptions.
- Dorcas, M., and W. Gibbons. 2008. *Frogs and Toads of the Southeast*. University of Georgia Press, Athens. 238 pp.
 - Extensive descriptions, life history, range maps, images.
 - Most up-to-date text available on species ranges and descriptions.
- Gibbons, W., J. Greene, and T. Mills. 2009. *Lizards and Crocodilians of the Southeast*. University of Georgia Press, Athens. 235 pp.
 - Extensive descriptions, life history, range maps, images.
 - Most up-to-date text available on species ranges and descriptions.
- Gibbons, W., and M. Dorcas. 2005. *Snakes of the Southeast*. University of Georgia Press, Athens. 253 pp.
 - Extensive descriptions, life history, range maps, images.
 - Most up-to-date text available on species ranges and descriptions.
- Buhlmann, K., T. Tuberville, and W. Gibbons. 2008. *Turtles of the Southeast*. University of Georgia Press, Athens. 252 pp.
 - Extensive descriptions, life history, range maps, images.
 - Most up-to-date text available on species ranges and descriptions.
- Dorcas, M. E., S. J. Price, J. C. Beane, and S. C. Owen. 2007. *The Frogs and Toads of North Carolina: Field Guide and Recorded Calls*. North Carolina Wildlife Resources Commission, Raleigh. 80 pp. and CD.
 - Extensive descriptions, life history, range maps, images, calls.

Internet Resources

Identification

- Reptiles and Amphibians of South Carolina and Georgia; University of Georgia Savannah River Ecology Laboratory (SREL), Herpetology Program
 - o Images (tadpole and adult), calls, range maps.
 - o URL - <http://srelherp.uga.edu/herps.htm>
- The Frogs and Toads of Georgia, by Walter W. Knapp
 - o Images (tadpole and adult), calls, range maps.
 - o URL - <http://wwknapp.home.mindspring.com/GAFrog.Toad.html>
- J.D.'s Herp Life List, by John D. Willson
 - o Images
 - o URL - <http://srelherp.uga.edu/jd/jdweb/Herps/species/herpll.htm>
- U.S. Geological Survey (USGS) Southeast Ecological Science Center
 - o Images (tadpoles and adults), calls, descriptions, life history.
 - o URL - <http://fl.biology.usgs.gov/herps/>
- AmphibiaWeb: Information on Amphibian Biology and Conservation
 - o Extensive descriptions, life history, egg descriptions, images, calls.
 - o URL - <http://amphibiaweb.org/index.html>
- Florida Museum of Natural History: Herpetology
 - o Krysko, K. L., K. M. Enge, and P. E. Moler. 2011. Atlas of amphibians and reptiles in Florida. Final Report, Project Agreement 08013, Florida Fish and Wildlife Conservation Commission, Tallahassee, USA. 524 pp. Available online: <http://www.flmnh.ufl.edu/atlas/FinalReportKryskoEngeMolerAtlasofAmphibiansandReptilesinFlorida08013.pdf>
 - o Images, dichotomous key for snakes.
 - o URL - <http://www.flmnh.ufl.edu/herpetology/herpetology.htm>

- Alabama reptiles and Amphibians
 - o Images
 - o URL - <http://www.alabamaherps.com/>
- South Carolina Reptiles and Amphibians
 - o Site administrator: E. E. Ott, neoPERCEPTIONS, South Carolina Wildlife
 - o Detailed descriptions, online dichotomous key for snakes, species comparisons, discriminating characteristics, egg descriptions, images of various life stages.
 - o URL - <http://www.snakesandfrogs.com/scra/species.htm>
- North Carolina Amphibian and Reptile Photos
 - o Site manager: C. W. Cook, Duke University, Carolina Nature
 - o Images, species descriptions.
 - o URL - <http://www.carolinanature.com/herps/>
- Amphibians and Reptiles of North Carolina
 - o Site manager: M.E. Dorcas, Herpetology Laboratory, Davidson College
 - o Detailed descriptions, range maps, images, calls.
- Carolina Herp Atlas
 - o Species distributions and range maps in North Carolina and South Carolina, images
 - o <http://www.carolinaherpatlas.org/>
- Alabama Wildlife and their Conservation Status (Amphibians and Reptiles)
 - o Descriptions, images
 - o URL - <http://www.outdooralabama.com/watchable-wildlife/what/>

Malformation and Disease

- U.S. Geological Survey (USGS) National Wildlife Health Center
 - o Disease and malformation information, reporting instructions.
 - o Meteyer, C. U. 2000. Field guide to malformations of frogs and toads, with radiographic interpretations. Biological Science Report USGS/BRD/BSR–2000–0005. U.S. Geological Survey National Wildlife Health Center, Madison, WI. Available online: http://www.nwhc.usgs.gov/publications/fact_sheets/pdfs/frog.pdf
 - o URL - http://www.nwhc.usgs.gov/disease_information/amphibian_malformation_and_decline/
- Partners in Amphibian and Reptile Conservation (PARC)
 - o Distribution of *Batrachochytrium dendrobatidis*
 - o URL - <http://www.parcplace.org/resources/204-amphibian-declines-a-chytridiomycosis.html>

Proficiency Evaluation

Prior to each field season, the Wildlife Biologist creates a test/examination to evaluate the identification skills of all field staff. The evaluation process consists of three components, 1) identification by sight, including larval and post-metamorphic stages, administered through a MS PowerPoint presentation, 2) identification by sound evaluated by presenting a suite of audio files of vocal Anuran calls, and 3) evaluation of the field crew's identification skills in a practice sampling location. The Wildlife Biologist identifies any areas where the members of the field crew need improvement and provides additional training materials as necessary. The Wildlife Biologist also makes the final determination of competency prior to data collection, and only field staff deemed fully competent undertake data collection. Despite extensive pre-field season training, the field team carries a variety of identification materials with them in the field for reference purposes.

Literature Cited

Powell, R., J. T. Collins, and E. D. Hooper, Jr. 1998. A key to amphibians and reptiles of the continental United States and Canada, 1st edition. University of Kansas Press. 160 pp.