



SWAP Learning Series #4

Interactive data and tools for SWAP planning and implementation

Date: March 15, 2023

Time: 2:00pm-3:30pm (ET)

Meeting Link: <https://fishwildlife-org.zoom.us/j/81010516371?pwd=d1BXd3pOUmEyeUNkdnZWRktNVldNUT09>

Meeting ID: 810 1051 6371

Passcode: 421283

One tap mobile:+16469313860,,81010516371#,,,,*421283# US

Overview: This SWAP Learning Series will explore how interactive data and tools can support SWAP planning and implementation strategies, including by making information more transparent, reusable, and actionable. Presenters will share information on two major initiatives. Drawing on a decade’s worth of experience with Network partners, NatureServe’s Species Habitat Modeling Program has developed a collaborative process to generate human-AI collaborative species habitat models that is a useful complement to guide decisions made as part of SWAPs. NatureServe’s Conservation and Environmental Review Tools combine a suite of standard “off-the-shelf” functionality with the ability to customize and build in advanced functionality to meet each agency’s unique needs. From Pennsylvania, this will include an overview of the Pennsylvania Wildlife Action Plan – Conservation Opportunity Area Tool and plans for a Conservation Action Tracker enhancement that will allow state agencies and the public to monitor the implementation of conservation actions set forth under Pennsylvania’s WAP.

MEETING AGENDA

Time (ET)	Topic	Speakers
2:00PM	Welcome and Intro	Mark Humpert, AFWA and Jason Goldberg, USFWS
2:05PM	<u>Collaborative Species Habitat Modeling for SWAPs</u> <i>Presentation & Q&A</i>	Gio Rapacciuolo, NatureServe
2:25PM	<u>A Configurable Platform for Delivering SWAP Interactive Web Mapping and Reporting Tools Used by 15 States</u> <i>Presentation & Q&A</i>	Lori Scott, NatureServe
2:45PM	<u>Pennsylvania Wildlife Action Plan-Conservation Opportunity (COA) Tool: A User-Guided Approach Supporting Species of Greatest Conservation Need</u> <i>Presentation & Q&A</i>	Diana Day, Pennsylvania Fish and Boat Commission
3:05	General Questions and Discussion	Webinar Speakers

	<ul style="list-style-type: none"> • What is your experience using NatureServe data and tools? • What could NatureServe do to better serve your state during its SWAP revision? • What other data sources and tools/functionality can help support SWAP planning and implementation? 	Mark Humpert, AFWA and Jason Goldberg, USFWS
3:30PM	Wrap up and adjourn	

Welcome and Intro

Mark Humpert, AFWA and Jason Goldberg, USFWS

- Thanks to everyone for joining!

Collaborative Species Habitat Modeling for SWAPs

Gio Rapacciuolo, NatureServe

- I oversee species habitat modeling program. We take NatureServe Network field data and generate models. We've had interest in using this to support SWAPs. We're in the infancy of doing that, so we'll focus on process today.
- Our process
 - Embedded throughout the process is partner engagement with Natural Heritage Programs throughout the network. That helps give us knowledge of species and habitats. We also engage with partners – project funders who will benefit from model outputs.
 - Model Building
 - Model Review
 - Model Delivery
 - Model Application
 - The process has a feedback between Model Building and Model Review, allowing for collaborative review. We take statistical output to confirm with on the ground knowledge.
- Example of Apalachicola False Rosemary
 - There was a need to update the range map for this species.
 - We got data on the occurrence of the species from the Florida Natural Areas Inventory and additional field data from USFWS – first set of inputs.
 - We then engaged with partners and experts to assess quality and validity of inputs. We vet the information that goes into the model, which will determine the quality of the outputs.
 - ECOS Range Map was updated to One Range map in 2023.
- We developed a Model Inputs Review Tool, which allows you to assess input data going into the model. It allows for comments to go to the modeler.
- Species data is combined with environmental predictors. We use that to characterize what the environment looks like where species has been detected. Occurrence data is combined with environmental predictors, which allows us to make projections of probable habitat for the species.
- Model Outputs Review Tool – Allows reviewers to report whether they think areas are overpredicting or underpredicting. Reviewers can give a semiquantitative review of the overall model and offer other feedback.
 - Models can be revised based on reviewer feedback.

- Model communication is important. We want users to understand the level of confidence in our models for appropriate purposes.
 - We provide summary information in PDFs along with spatial outputs.
- We can also produce highlighted areas of habitat probability where a species is likely to be found, which can support inventory efforts.
- We can identify management responsibilities and partners in conservation. Who manages the land that overlaps areas of predicted habitat
- We can stack models on top of each other to show distributions of multiple species. For example, one our Map of Biodiversity Importance made into the New York Times.
- Applying to SWAPs
 - Supporting Utah Wildlife Action Plan. Objective was to generate estimates of habitat distribution for 13 species.
 - Range of species – butterflies, amphibians, mammals, flowering plants, birds, and fishes.
 - Anticipated outcomes to improve information on likely distribution of Utah WAP SGCNs, guidance on prioritizing conservation actions across the landscape, etc.
 - Other work happening in NY, AZ, and other states
- Discussion
 - How long does it take to go through the species habitat modeling approach that Gio has outlined here?
 - Good question which is hard to answer! It can vary widely depending on the state of species occurrence inputs, species characteristics, funding available, staff capacity, and partner constraints. In general, we run model cycles of about 6-12 months.
 - And by model cycle I do mean a full round of modeling all the way to the desired output for the given application (so potentially multiple model building-review cycles)
 - Response: So, for example, the Utah project with 13 species, is that a 12 month project or much longer? I wasn't very clear on my first question, sorry.
 - No worries! The project funding was allocated over a period of 18 months but the understanding is that most of the work would happen over 8-10 months
 - How do you deal with the bias of using artificial boundaries in your state specific range models, which may limit the models ability to capture all of the environmental conditions they may be able to live in?
 - That's a great question with a possibly frustrating answer. We have no magic wand here: state-only models (just as US-only models which we mostly produce in any case) potentially violate the assumption that the full environmental gradients occupied by the species are being comprehensively represented. However, funding and data availability constraints are such that we are frequently in this situation. What we try to as a standard procedure is to carry out extensive spatially independent model validation to assess how well the captured environmental relationships seem to predict spatially independent data. This "can" be an indication of how much we have captured the species' habitat requirements despite missing substantial portions of its range. In general, this information will impact the model confidence and recommended uses we attribute to each model. Would be very happy to hear your thoughts on this!
 - Response: Thanks for your thorough answer. given your constraints, that makes sense. If you are using some sort of cross-validation (e.g. ENMEval) or AUC as a

means of model evaluation, I would be wary since over-fitted models may have overestimated confidence metrics. See Jimenez-Valverde, A., Lobo, J. M., & Hortal, J. (2008). Not as good as they seem: The importance of concepts in species distribution modelling. *Diversity & Distributions*, 14, 885–890.

- We use a range of metrics, including but not limited to AUC (also TSS, sensitivity, specificity...) to assess. And thank you for the reminder of that classic paper!
- How do you incorporate climate change into your models?
 - We currently do not by default. It's one of the main applications where we want to spend more time. It's an additional component.
 - We're looking at current time period, but we don't project anything forward. It hasn't been a priority.
 - Include SWAP voluntary guidance.
- How do you address migratory birds?
 - We do run models for migratory species, but it can be more complicated. We run models for different stages of the species' life cycle, acknowledging its species.

Configurable Platform for Delivering SWAP Interactive Web Mapping and Reporting Tools Used by 15 States

Lori Scott, NatureServe

- We provide science and data standards in addition to tool development.
- NatureServe Explorer is an online resource for cross-state planning. <https://explorer.natureserve.org>. Updated recently to become a more map-centric tool allowing different layers to be combined.
 - Data can be presented in different ways, such as by density maps of different animals and plants, or you can explore a specific area of interest. You can also bring in your own data.
 - Allows data to be shared with the public at different scales.
 - Links to State tools, such as review tools we've developed with state agencies.
- Environmental Review Tools
 - Deployed in several states since 2013 across the country.
 - (See links in slides.) All of these tools have links to state agencies. Access can be configured in different ways.
- One core platform configured for each state, using Drupal and ESRI. Customized to online mapping and analysis. state-specific environmental review process, and conservation planning analysis and output.
- The work has helped streamline environmental planning.
- In 2022, two new tools launched in MN and TN. Over 5,000 new users (over 12,000 currently). Over 43,000 projects, over 17,000 projects had no conflict, and 4,700 conservation reports.
- Many ways to analyze data.
- Caroline Jezierski (NE) – [Nebraska Conservation and Environmental Review Tool \(CERT\)](#)
 - On the map, you can draw project boundaries, create a project, and select what type of project it will be (e.g., Conservation Planning Report, Power Line & Substations, Bank Stabilization)..
 - For every project, you get a report (PDF), GIS shapefile, and species results (CSV), along with KMZ for using in Google Earth.

- The Conservation Planning Report gives basic information about the project, such as size and county and watershed where it is located. It then provides maps and tables showing different features, such as protected areas and what's in the vicinity of the project.
- The first table shows protected areas in the project review area
- There are three tables that show special status species (i.e., USFWS and state listed, Tier 1 and Tier 2 Species of Greatest Conservation Need, SRank, GRank, S1-S3 plants), natural communities, and selected special areas.
 - Table 2 - documented occurrences in the project review area
 - Table 3 - documented occurrences within three miles of the project review area
 - Table 4 – potential occurrences in project review area
- Wanted to incorporate more of SWAP into the CERT. NE worked with NatureServe to develop a grant proposal for the Competitive State Wildlife Grant Plan Enhancement Program to enhance the CERT to distribute more information about NE's SGCN and special areas.
 - The Conservation Planning Report will have habitat, threats, and research and inventory needs for Tier 1 SGCN and information from the Biologically Unique Landscapes found in the project review area..
 - Updates will be made to enable users to create both an Environmental Review Report and a Conservation Planning Report
 - .
- Two distinct tools developed for PA
 - <https://conservation.dcnr.pa.gov>
 - <https://wildlifeactionmap.pa.gov>
 - One is regulatory, one isn't, among other differences.

Pennsylvania Wildlife Action Plan-Conservation Opportunity (COA) Tool: A User-Guided Approach Supporting Species of Greatest Conservation Need

Diana Day, Pennsylvania Fish and Boat Commission

- This work requires a lot of partners.
- We needed to make conservation delivery easier. Wildlife Action Plans are huge, with hundreds of actions, so where is action to be done?
 - Sought to develop a tool to help identify where the work can be done.
- Public launch in August 2019.
- Brings together a large amount of information – the data itself, best management practices, etc. Makes information more relevant for users by focusing on their needs. Data is regularly updated with new species information and functionality.
- Audiences include resource managers, private landowners, researchers and educators, and interested public. Our goal is to see Wildlife Action Plans used!
- Known occurrences are prioritized over likely or unknown occurrences.
- <https://wildlifeactionmap.pa.gov> - Let us know if you would like a demo!
- A variety of data can be brought up in the tool.
- Users can generate reports for specific areas of interest. Reports provide information on SGCN, habitats, recommended primary and secondary conservation actions, research and survey needs, and contact information for assistance. Prior to implementing on-the-ground work, users should submit their projects through the Pennsylvania environmental review tool ([Pennsylvania Conservation Explorer](#)).
- Links to Best Management Practices are provided.

- Enhancement forthcoming – Conservation Action Tracker (CAT)
 - Will allow users to use existing Area of Interest or delineate a new Action Area.
 - Will allow users to specific project focus as “species” or “habitat”
 - Select specific actions, research, and survey needs to be implemented.
 - Allows for project visibility to be specified (e.g., private, county, public)
 - Allows users to work in groups, either in the same team or across organizations.
- Discussion
 - Are there any recommendations for SWAP data format or database structure to make something like the COA tool possible for a state to develop after the 2025 SWAP?
 - Dos and don'ts? What pitfalls exist?
 - Primary recommendation is to HAVE A DATABASE! It is impossible to create something like the COA tool without one. We used Excel spreadsheets from which data were compiled into MS-Access. A SQL database would be preferable to Access to facilitate data transfer between systems, as necessary. Applying data standards for SWAP development (see [2022 Northeast lexicon](#) as an example) could facilitate information gathering and delivery. If starting from scratch, develop a geodatabase.
 - What were some of the reasons you made your COA tool separate from your ERT?
 - WAP is non-regulatory. ERT is regulatory. We wanted to keep the distinction and avoid any confusion.
 - Wondering how sensitive species locations are handled in the database (herps specifically)?
 - Actual species occurrence data are maintained by the Natural Heritage Program. The COA Tool would report “known” or “likely” occurrence in the Area of Interest Report. The COA Tool has user-permission levels, limiting access to sensitive data. Privileges can be carried over from the environmental review tool.

General Questions and Discussion

- What is your experience using NatureServe data and tools?
- What could NatureServe do to better serve your state during its SWAP revision?
- What other data sources and tools/functionality can help support SWAP planning and implementation?

- Caroline: Both the SWAP and environmental review process are part of the Nebraska Game and Parks Commission. Also, I am an optimist and hope that folks will run both reports and go beyond what is required by the regulatory process.

- Caroline: NatureServe has been a great partner.

- Accessing NatureServe data through the API is great - but merging those data with all the other data sources referred to in SGCN selection is so hard. It's basically a manual process of finding the current valid name and trying to match the different lists up. Anything that could help with taxonomic synonyms would be so helpful.
 - The Explorer interface and API search on synonyms. Also, NatureServe's science team is close to complete in tagging all SGCN (2015) species in an extensible field in Biotics central database Element Subnational records - this field is not in the API, but we may be able to assist states who are struggling with species / SGCN name matching.

- I haven't gone through a SWAP revision yet, so it's not clear to me how NatureServe can help there. In my position, I use NatureServe Biotics and Explorer to look at ranks and dates of rank reviews for different projects.
- Ginny – Echoing comments that NatureServe is very helpful!
 - Most States have some sort of SWAP website. Is there any interest in doing some kind of content management template for SWAP websites? Having the information about SGCNs, COA, etc. are content management issues rather than web-based functionality. A consistent template would be helpful, especially if they could be managed by one entity.
 - Lori – Existing ERT tool could be expanded for typical SWAP content.
 - Climate change vulnerability assessments are hard to address. If there is interest in broader assessment of climate change, it would be of interest to use.
 - We have a new project working to develop an online version of the climate change vulnerability index tool. Goal is to have this done within a year, in time to help states with SWAP revisions due in 2025
 - From Kevin B. - Virginia, I work at the NE CASC and we are creating a climate change synthesis where we are summarizing all of the CCVAs for the northeastern RSGCN species - - perhaps your CASC is doing something along those lines?

Past & Future SWAP Learning Series (Tentative Schedule)

Date	Topic (w/Recording Link)	Recording Password	Link to Notes
Wednesday, November 16, 2022	#1 Engaging Tribes and Indigenous People in State Wildlife Action Plans	0T?41Gz.	
Wednesday, December 14, 2022	#2 SWAPs and Climate Adaptation Guidance	XU.=69*j	
Wednesday, January 18, 2023	#3 State Wildlife Action Plans and Renewable Energy	=7NSqgQT	
Wednesday, March 15, 2023	#4 Interactive data and tools for SWAP planning and implementation		
Wednesday, April 19, 2023	#5 Engaging Diverse Partners & Making your SWAP More Relevant		
Wednesday, May 17, 2023	#6 Using the SWAP & Landscape Conservation Framework for Interjurisdictional Landscape Conservation		

Wednesday, June 21, 2023	#7 Making Your SWAP RAWA-Ready		
Wednesday, July 19, 2023	#8 Incorporating corridors into your SWAP		
Wednesday, August 16, 2023	# 9 Connecting federal planning efforts into SWAP (NWRS, USFS, BLM)		
Wednesday, September 20, 2023	#10 Incorporating Fish & Wildlife Health and One Health into your SWAP		