



**Virtual Joint Meeting of the
Monitoring Advisory Coordinating Committee
and the
Science & Technical Advisory Committee
November 18, 2020, 10:00 AM – 2:45 PM
Zoom**

Draft Meeting Minutes

Meeting Attendees

MACC

Jake Bransky (DRBC)
Elizabeth Brown (PA Audobon)
Sheila Eyster (USFWS)
Matthew Fritch (PWD)
Rebecca Harris
Brian Henning (NJDEP-BFBM)
Kristen Bowman Kavanagh (DRBC)
Paul Kazyak
Chris Kunz
Hoss Liaghat (PADEP)
Preston Luitweiler
Ron MacGillivray (DRBC)
Catherine Magliocchetti
Christopher Main (DNREC)
Eileen Murphy (NJ Audubon)
Scott Northey (Chemours)
Elaine Panuccio (DRBC)
Marc Peipoch
Bill Richardson (EPA)
Roger Thomas (ANS Drexel)
Li Zheng (DRBC)

STAC

David Bushek (Rutgers HSRL)
Lance Butler (PWD)
Kim Cole (DNREC)
Dorina Frizzera (Getting To Resilience LLC)
Drew Greif (USGS)
Kevin Hess (PA DEP Coastal Program)
Ron Heun (Exelon)

STAC (ctd.)

Doug Janiec (Sovereign Consulting)
Desmond Kahn (Fishery Investigations)
Danielle Kreeger (PDE)
Greg Lech (PA Fish & Boat Commission)
Josh Moody (PDE)
Jason Morson (Rutgers HSRL)
Daphne Munroe (Rutgers HSRL)
Alison Rogerson (DNREC)
Dave Smith (USGS)
Kelly Somers (EPA Region 3)
Kari St. Laurent (DNREC)
Ken Strait (PSEG)
Namsoo Suk (DRBC)
Beth Watson (ANS Drexel)
Bart Wilson (USFWS)
David Wolanski (DNREC)
Matthea Yepsen (NJDEP)

Other Participants

Emily Baumbach (PDE)
Sarah Bouboulis (PDE)
LeeAnn Haaf (PDE)
Kathy Klein (PDE)
Leah Morgan (PDE)

Welcome & Call to Order

- 10:20: Elaine called to order. Meeting had a late start due to issues with GoTo Meeting, requiring a switch to Zoom.
- To make up time, there were no introductions. Roll call was taken from the electronic list of remote meeting participants.

Group COVID-19 Restrictions and Monitoring Work Updates

- **DRBC:**
 - **E. Panuccio:** Monitoring had been paused from 3/16/2020-7/14/2020 and has since been more difficult due to social distancing and Covid concerns (for planned boat-based monitoring efforts) – wearing masks and social distancing has been enforced.
 - **J. Yagecic:** Delaware Estuary monitoring program boat run resumed in August partially. Samples were collected from Paulsboro and downstream from August to November this year. Boat run is over for 2020, but will resume in March 2021. When it starts in March, DRBC will have full domain of the boat run and will require more help. DRBC is confident they will get back to a full boat run in March.
 - **R. MacGillivray:** A pilot study on bacteria collection was carried out by the DRBC. Field work sites cover Trenton to Lewes, Delaware City, Chester, and Philadelphia. Collectors were deployed in October for one month and sent to USGS. Dissolved PCBs will be added to PCB dataset.
- **PDE:**
 - **D. Kreeger,** PDE adopted safety protocols for doing fieldwork in Covid to continue through the pandemic. Because of this, PDE has met most 2020 field goals.
 - **J. Moody:** living shoreline monitoring had safety measures in place, small teams working from late summer through fall. The Maurice river living shoreline was installed, and all NJ and DE living shoreline monitoring sites were completed this year, with the sections of shorelines consisting of 200 meters and produced by Haskin Shellfish Research Lab. Some field validation for the Living Shoreline Feasibility Model was pushed to be online with NJDEP and DNREC, but in the next few months it will be validated in person as this work only needs one person. Installation of freshwater mussel gabions at Bartram’s Garden was pushed back to 2021 due to the increased number of people required for the install. **L. Butler** added that the revised field plan for the project has since been approved by PWD.

- **L. Haaf:** wetland surface elevation readings plans were not completed, but all other wetland field monitoring did get done. Surface elevation time series readings will likely be collected next March, but data sets should still be functional without data from this one year.
- **DNREC:**
 - **A. Rogerson:** The DNREC wetland monitoring assessment program was delayed this spring, which missed some inland bays areas. Long term monitoring with the Center for the Inland Bays will cover stream assessment and pilot testing of a rapid assessment method. This fieldwork was delayed in the beginning of the year but was safely able to get completed.
- **Audubon Pennsylvania:**
 - **B. Brown:** Covid guidelines were/are being followed by partners during the Audubon bird monitoring program. A volunteer program about water quality, riparian zones, and measuring growth of freshwater mussels at the Discovery Center in Philadelphia is also in development. Although the work on this program has been delayed, there is hope to continue making progress on it as conditions allow.
- **NJDEP:**
 - **M. Yepsen:** In line with NJ State advisories and restrictions, NJDEP monitoring programs were paused until end of summer. The PDE/Barnegat Bay wetland collaboration has led to a virtual MACWA (Mid Atlantic Coastal Wetland Assessment) meeting and MidTRAM (Mid-Atlantic Tidal Rapid Assessment Monitoring) training occurring online rather than in the field. DEP has Beneficial Use Projects in DE Bay, and since it was a “chill” year for monitoring, the limited work still got done although it took some extra work to comply with Covid guidelines. By mid-summer most groups were back up and running with field work. In the spring of 2021, the National Wetland Condition Assessment will be an objective, pending state-to-state travel restrictions.
 - **C. Kunz:** Bureau of freshwater and biological monitoring put everything on hold mid-March. USGS gave assistance for chemical and physical monitoring of rivers and streams but now fieldwork is basically back to full capacity. Monitoring requires teams of 2 or more complying with Covid guidelines. Routine monitoring was put on hold, in addition to fish IBI monitoring. Some eDNA work was assessed as a supplement to real-time monitoring results.
 - **B. Henning:** fish monitoring program was cancelled in the summer due to not enough vehicles or non-hourly staff around.
- **PADEP:**

- **K. Hess:** most monitoring was cancelled, with field work limited to high priority functions while following Covid guidelines. The side-scan mussel survey work was summarized in a report for all efforts to date, and this is available on Coastal Resources Management Program webpage. The new side scan hasn't been able to be used this year.
- **United States Geological Survey (USGS):**
 - **D. Reif:** Normal field work is continuing for USGS. Freshwater mussel field work at the Independence Sea Port museum at the Ben Franklin Bridge in Philadelphia with NGWAS has been difficult but normal operations are continuing.
- **Haskin Shellfish Research Laboratory (HSRL):**
 - **J. Morson:** The stock assessment survey that is part of the core oyster monitoring program has wrapped up. The workshop of the oyster industry scientific steering committee will be virtual and held on February 9-10, 2021. The last dermo monitoring trip will take place the last week of November 2020, and all planned 2020 fieldwork will be completed. **D. Munroe** mentioned that some grad student research has continued but others have been slowed down due to students attending classes from home and returning to campus sparingly.
- **PA Fish and Boat Commission:**
 - **G. Lech:** Covid caused delays in the survey season, but striped bass in the Delaware Estuary and American shad in the upper portion of the river have been monitored. About 20 mussel surveys have been completed this year, with six species in Bucks County.
 - **R. MacGillivray** has been in contact with Jeff Smith and wants to follow up about using PAFBC fish collected in DE river for analysis in PFAS.
- Nothing was reported out regarding monitoring from NYDEC, USFWS, or Stroud Water Research Center.

DRBC Monitoring Activities Planned for 2021

- **J. Yagecic:** DRBC is carrying out boat-based estuary bacteria monitoring, which was pushed off from 2020 due to Covid but will begin in 2021. DRBC wants to observe in-river bacteria concentrations to compare near-shore bacteria concentrations after collecting shore-based samples 5 times per month during the 2019 and 2020 summers. It is suspected that lower bacteria concentrations will occur in the middle of the river and increased bacteria concentrations will occur near shore. DRBC also wants to differentiate human derived vs animal derived bacteria, which is more uncertain with an unknown price. Developments will be reported as they occur.
 - The Delaware Estuary Water Quality Monitoring Program (or boat run) will commence monthly from March – October 2021 between DRBC River Miles 6.5

and 131. DRBC is optimistic that the full 22 stations will be surveyed for water quality, bacteria, etc. Samples of routine, bacterial, nutrient, algal, sodium and biotic ligand model parameter will be collected. Expanded salt ion may be surveyed as part of the boat run to differentiate ocean-derived from estuary-derived salt.

- 1,4-Dioxane monitoring is added to the 2021 Boat Run Monitoring Program to capture mainstem Estuary concentrations in addition to the 1,4-Dioxane tributary monitoring and trackdown planned for 2021.
- Eutrophication model is also being developed.
- Thermal Exceedance Shading Study planned for 2021. Numerous reservoir releases in summer 2020 were required to meet multi-agency temperature targets in the upper Delaware to protect aquatic life. In addition to these various targets, climate change will likely exacerbate the issue. In the upper Delaware, there is sparse population, yet warming may still occur and cause thermal exceedances. Identifying areas with insufficient tree canopy coverage, and remedying the issue with tree planting efforts, will increase shading over time and may combat thermal heating in these targeted stream reaches.
- In autumn of 2020, NJ American Water identified 1,4-Dioxane in their intakes and initiated a monitoring effort in the Delaware River and tributaries. To extend this effort, DRBC sampled areas of the Delaware Estuary and tributaries, and into the non-tidal portion, up to Belvidere, NJ, and a focus on the Lehigh River.
 - D. Kahn asked what 1,4-dioxane was. J. Yagecic responded that it is anthropogenic, used in industrial products, and related to solvents and solvent contamination, and is continually being monitored both in the estuary and nontidal tributaries also. The toxics advisory committee will be included in the future, but preliminary work is not ready to discuss yet.
 - D. Kahn also asked whether DRBC is trying to find out where 1,4-dioxane coming from, if it's toxic, etc. R. MacGillivray replied that DRBC has been working with a student about contaminated sites around the Delaware River that have 1,4-dioxane to see if there is an exchange between groundwater and surface water.
 - D. Bushek asked for more specification on why bacteria was being monitored; J. Yagecic clarified that bacteria is being monitored for recreational parameters.
- **J. Yagecic** gave link (<https://www.drbc.net/Sky/uptemp.htm>) regarding temperature in the upper Delaware, which is a daily temperature dashboard, used for monitoring for trout thresholds for temperature.

- **E. Panuccio** of DRBC reported on the Non-tidal Chloride Monitoring Program, 2-year monitoring effort (starting April 2021) in the Special Protection Waters area to capture continuous specific conductance data and grab samples for chloride & TDS analyses, targeting areas with insufficient existing data, in addition to possible “hot spots” (sites in which chloride and/or specific conductance are relatively high, or show trends of increasing).
 - Sites in SPW range from Hancock, NY to Trenton, NJ, and this project will be limited to the lower Delaware and parts of Middle Delaware SPW portions. Only a few sites don’t show measurable change in chloride across Lower Delaware sites.
- **C. Kunz** of NJDEP mentioned a similar effort that recently occurred and will share information about that work with DRBC to aid with monitoring protocols and site selection. The presentation is included on the MACC page. Recently, DRBC had the continuous specific conductance loggers serviced and recalibrated by Onset. With 8 loggers in-house, plans to purchase 2 more, and the possibility of borrowing more from other agencies, there will be 10-12 sites to select for continuous specific conductance measurements. For the chloride & TDS grab samples, ~30 sites will be selected, 10-12 at the continuous logger locations. The purpose of this project is to fill data gaps for widespread use and knowledge, identify “problem” areas, and propose possible trackdown studies where they may be needed.
 - D. Kahn asked how far up the river DRBC is sampling, and whether sodium is being ignored. E. Panuccio replied that sodium was not collected, and chloride affects the environment and macroinvertebrates. D. Kahn asked about data being collected in DE tributaries on chloride and classification of sites in lower/middle/upper Delaware river sites, which E. Panuccio clarified, mentioning the naming system is defined by DRBC. C. Kunz and E. Panuccio to touch base regarding non-tidal chlorine monitoring; Chris suggests adding discharge as a parameter.
 - Link (<https://drbc.net/Sky/waterq.htm>) was shared by J. Yagecic regarding water quality information collected by DRBC, who noted that DRBC does near-real time assessment of sodium and chloride criteria.
 - **M. Peipoch** of Stroud Water Research Center shared network link in the Zoom chat (<http://data.envirodiy.org/browse/>) and advised using it before selecting 30+ more sites to avoid overlap of heavily-impacted sub-watersheds.
- **J. Bransky** of DRBC reported on Biological Monitoring in the non-tidal mainstem and basin-wide tributaries scheduled for 2021.
 - Mainstem non-tidal monitoring at sites from Trenton, NJ to Hancock, NY with 25 locations. DRBC is working on modifying existing sampling methodology to possibly reflect PADEP’s recently published semi-wadeable large river multi-

metric index methodology. Site selection and methodology currently under development for the basin-wide tributaries biological monitoring. Site selection focused on representing entirety of the basin to include: some urban, some coastal, some pristine headwaters, etc. The goal for this project is to develop a long-term basin-wide tributary monitoring program with a uniform sampling protocol. Currently, each basin state collects and analyzes macroinvertebrates data differently, which presents difficulties when comparing data among states.

- Microplastics monitoring, which DRBC got a grant for in 2019, is planned to be carried out in 2021. Samples were collected, and results are coming now because of delays due to Covid. Due to this delay, DRBC received a no-cost time extension for this project until December 2021. More samples may be collected using continuous filtration nets in the future pending lab results. An additional portion of this project involves target cleanup efforts in watersheds with high plastic levels, which will be scheduled for summer/autumn of 2021 pending results.
- D. Kahn asked how specifically DRBC classifies macroinvertebrates, and J. Bransky said it's usually down to genus, and can be found on water quality portal (<https://www.waterqualitydata.us/data/Result/search?organization=DRBC&assemblage=Benthic%20Macroinvertebrates&mimeType=csv&zip=yes&dataProfile=biological>).
- **R. MacGillivray: Delaware River PFAS Monitoring**
 - An anticipated PFAS analysis will be done on fish for water quality criteria. Monitoring of freshwater mussels would also hopefully be completed as well.
 - In recent years, PFNA, PFOA, and PFOS in Delaware River source water samples have been below adopted or proposed MCLs, however, elevated levels of PFOS in fish tissue exceed estimated fish consumption advisory levels. Chloro perfluoro polyether carboxylates (ClPFECAs) and hexafluoropropylene oxide dimer acid (HFPO-DA) used as replacement chemicals have been detected in Delaware River. Surface water quality criteria for protection of human health, aquatic life and aquatic dependent wildlife are not available. More research and data are required.
 - Further monitoring and data collection needed for: fish consumption advisories, source water protection (determine occurrence of other PFAS and alternative compounds), and protection of aquatic life.
 - For 2021 and future monitoring, DRBC will focus on monitoring occurrence of PFAS in the following of the Delaware River: surface water (tidal and non-tidal), sediment (predominantly tidal), fish tissue (primary focus on fillet data with some whole fish data collected), and aquatic biota (possible analysis of caged

mussels from 2019-2020 non-tidal deployment). The method used will be LC MS/MS Isotope dilution with extended list of 40 PFAS analytes versus 13 PFAS in previous studies. A more in-depth discussion on this matter will occur at the next virtual Toxics Advisory Committee on January 28, 2021 (1:00-4:00PM). In September of 2020, an article on this subject was published by Ron MacGillivray (Temporal trends of PFAS in Delaware River Fish, USA. Integrated Environmental Assessment and Management).

- Sampling through 2027 is currently trying to be scheduled, and coordination has been collaborative among DNREC, NJDEP, etc. D. Kreeger mentioned PDE library of freeze dried tissue samples of mussels if there should be a need in the future for use by partners.
- **D. Reif:** USGS started sampling for PFAS. Data will be collected through September 2021 and data will be available upon completion of processing.

Group Monitoring Activities Planned for 2021

- **G. Lech:** PA Fish and Boat Commission has new strategic plan to guide through 2023. Status assessments will be conducted for species occurring in the estuary.
- **M. Yepsen, NJDEP:** National Wetland Condition Assessment, long term monitoring sites; **C. Kunz:** monitoring scheduled to resume, and is subject to change depending on Covid.
- **K. Hess** of PADEP was not prepped to give broader DEP sampling updates, and had nothing to add currently.
- **D. Greif** is looking to get a year's worth of PFAS data. Sediment samples are being collected at White Clay Creek sites to research sediment/turbidity relationship. Independence Seaport Museum by the Ben Franklin Bridge will be used as an innovation site, with new probes being installed to monitor nitrate, chlorophyll, etc.
- **B. Wilson,** USFWS said monitoring on post-Sandy resiliency project sites is continuing with abiotic monitoring.
- **D. Kreeger,** PDE: in 2021 PDE intends to monitor our regular fixed wetland stations, and perform mussel and living shoreline monitoring *ad hoc* as grant funds allow. PDE hopes to sustain broader MACWA programming, but the funding for wetland monitoring has been getting much tougher to find. J. Moody and L. Haaf have been working with the states to develop several new model tools to assess site-specific condition and link to restoration project siting and design, where appropriate. All of PDE's monitoring is subject to ephemeral competitive grants.
- **M. Frich,** PWD: almost all monitoring activities are continuing except for Schuylkill Boat run which is happening in 2021. PWD will continue to monitor for PFAS in surface water in 2021 and take 1,4-dioxane samples every two weeks for most of next year. PWD PFAS Characterization report: <https://water.phila.gov/pool/files/20201030-pfas-report.pdf>

- Motion to accept meeting minutes from STAC/EIC meeting of October 28, 2020 was approved.

PDE and STAC Updates

- **E. Baumbach** of PDE gave an update on the Delaware Estuary Monitoring Assessment Report.
 - The three main steps are monitoring workshop, post-workshop survey, baseline monitoring inventory.
 - The current inventory covers living resources, water, and habitats, and the report outline covers background information, monitoring activities/feedback, future monitoring prioritization, and reference documents.
 - It was noted that the addendum to CCMP is being completed, and end of 2020 and beginning of 2021 for peer review of complete draft report will be initiated. E. Baumbach will send the draft report with PowerPoint to STAC group, and to those who are interested in reviewing the document. So far, there are about 100 individuals and counting who will have reviewed this report upon finalization.
 - Next steps: PDE to complete draft report and solicit feedback toward the end of this year/early next year with the final report slated for early-mid 2021. Updates to be included on CCMP page on PDE website.
- **S. Bouboulis**: PDE Summit 2021
 - Summit will be virtual and held March 1-3, 2021.
 - Theme (informal): Celebrating Successes & Evolving for the Future
 - If anyone has ideas for speakers please get in touch with D. Kreeger or S. Bouboulis.
 - D. Smith: Bill McKibben (billmckibben.com), John McPhee, Kate Raworth (KateRaworth.com/doughnut/#).
 - D. Kahn suggested Ken Able.
 - D. Munroe suggested Katherine Hayhoe (katherinehayhoe.com/wp2016).
 - C. Kunz: Maria Caffrey (mariacaffrey.com).
 - D. Frizzera suggested Isra Hirsi, Alexandria Villsenor, Xyie Bastida
 - Special sessions will be taking place throughout the summit: e.g., climate change forum, 25th anniversary panel, urban waters panel.
 - Abstract submission will likely stay open until December 4, 2020. Poster sessions will cover 2 sessions over 2 days. Conference videos will be available after it ends to help keep time and prevent attendees from missing any presentations.
 - K. Somers attended SETAC and said pre-recorded presentations offered more questions, feedback, and responses versus live speaking. Concurrent sessions like panels also took place. Someone is also staffing a “help” room at all times in case

people have issues getting into certain rooms. Get in touch with Kelly about more feedback regarding lessons learned with this avenue, etc.

- PDE will be using the Sched platform for scheduling, organization, networking, etc., for conference attendees. View the summit website to register or find more info at www.delawareestuary.org/summit.
- **L. Haaf** of PDE gave TREB (Technical Report for the Estuary and Basin) updates
 - What needs to be/could be updated?
 - All 60 indicators to be reviewed
 - Funding is limited.
 - Looking to collect feedback on current structure of the TREB, what new data are available, and how we can adapt to changing needs.
 - Do we need to add new or reconsider old indicators?
 - Survey about TREB is open now at <http://www.surveymonkey.com/r/59Q7F8T>. Please respond by December 21, 2020 if you need financial assistance. All other contributors please respond by January 15, 2021.
 - M. Yepsen can help with intertidal wetlands, etc., as needed
 - A. Rogerson can help with wetlands.
 - Sheila Eyler noted in the Zoom chat that she cannot lead the living resources chapter but will look at the fisheries references and provide any updated information that may be available.
 - N. Suk clarified that multiple personnel with DRBC will be helping with water quality and quantity chapters (chapters 2 and 3).
 - STAC briefs and related reports can be found here:
<https://www.delawareestuary.org/science-and-technical-advisory-committee/science-technical-advisory-committee-reports/>

Roundtable Discussion

- Next meeting to discuss how to integrate more science back into the STAC.
- TREB will need reviews by STAC, MACC, and EIC before finalization.
- Is there any link between TREB indicator reporting and the monitoring inventory report?
 - Are there redundancies, etc?
 - **D. Kahn** suggested that the STAC look at the TREB indicator list before the next STAC meeting, for discussion.
 - **D. Kahn** was impressed with how monitoring programs are beginning to tackle new research topics (non-tidal chlorine monitoring, PFAS, 1,4-Dioxane), and speculated whether other programs are suffering.
 - **E. Panuccio** commented that Covid has caused funding limitations but they can be worked around, and less expensive work can be focused on.

J. Yagecic noted the opportunity to focus on special interest topics rather than large routine monitoring programs.

- **J. Yagecic:** DRBC monitoring has been focused on eutrophication model, but things that had been paused are starting to be looked at again. Monitoring is being completed in unique ways.
 - https://nj.gov/drbc/library/documents/Res2017-04_EstuaryExistingUse.pdf -- Resolution 2017-4.
- **N. Suk:** Implementation of eutrophication model is targeted for 2022. The Water Quality Advisory Committee met with the Eutrophication Model Expert Panel in October 2020.
 - View the website to learn more info regarding meetings, etc.: https://www.nj.gov/drbc/about/advisory/WQAC_index.html and find the most recent update on the dissolved oxygen project here: https://www.nj.gov/drbc/library/documents/WQAC/072820/Suk_StatusUpdate_AquaticLifeUse.pdf.
- **J. Yagecic:** new tech in environmental field: Fluidion device, a rapid bacteria enumeration technology, reads bioluminescent markers and is used for bacteria in water to uncover water chemistry.
 - **D. Reif:** USGS will be testing the method to assess how it works to bring bacteria in to the “real time world.” To be applied to the project at Ben Franklin Bridge near the Independence Seaport Museum. USGS also purchased the YSI EcoMapper to be used for side-scan sonar imagery and bathymetry.
 - **E. Panuccio:** Aquabotix SwarmDiver: drone-like units communicate together to collect transect data, set coordinates for sampling sites (<https://www.aquabotix.com/>).
- **C. Kunz:** https://www.nj.gov/dep/wms/download/njwmc_agenda02_9-26-2018.pdf
 - New Jersey Water Monitoring Council agenda from 2018
- **B. Brown:** Delaware River Basin Restoration Program needs survey: https://docs.google.com/forms/d/e/1FAIpQLScTM-AZpTvrl_vGu9LQUp5PNkcw5Yj6ZXq3u6ikuro8omG7Hw/viewform
- **E. Murphy** of New Jersey Audubon is looking for an inventory of future project needs -- \$9.7 million is needed, but Audubon is advocating for 10 million and needs to prove the need.
 - Are there are enough projects to warrant the ask?
 - Include all ideas (research, monitoring, restoration, etc.) regardless.
- Next joint STAC/MACC meeting will be in late spring/early summer.

Meeting Adjournment

- Meeting was adjourned by **E. Panuccio** at 2:40 PM.

Listed Acronyms

- ANS: Academy of Natural Sciences (Drexel)
- DNREC: Department of Natural Resources and Environmental Control (Delaware)
- DRBC: Delaware River Basin Commission
- HSRL: Haskin Shellfish Research Laboratory
- MACC: Monitoring Advisory Coordinating Committee
- NJDEP: New Jersey Department of Environmental Protection
- PADEP: Pennsylvania Department of Environmental Protection
- PDE: Partnership for the Delaware Estuary
- USGS: United States Geological Survey
- PAFBC: Pennsylvania Fish and Boat Commission
- PFAS: Per-/Polyfluoroalkyl substances
- STAC: Science and Technical Advisory Committee
- TREB: Technical Report for the Estuary and Basin
- USFWS: United States Fish and Wildlife Service