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Fish and Shellfish Program NEWSLETTER

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In This Issue

https://www.epa.gov/fish-tech

Recent Advisory News

Fish Advisory for Lake Casitas Offers Safe-Eating Advice for Four Species

On November 21, 2024, the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA) issued a fish consumption advisory for Lake Casitas, located approximately 8 miles northwest of the city of Ventura, in Ventura County. The advisory provides safe-eating advice for black bass species, common carp, sunfish species and threadfin shad.

OEHHA's Good Catch California program routinely develops fish advisories so Californians can make healthy choices about the fish they catch in waterbodies across the state.

"Many fish have nutrients that may reduce the risk of heart disease, and fish are excellent sources of protein," said OEHHA Acting Director Dr. David Edwards. "OEHHA's guidelines help people eating fish caught in Lake Casitas to make healthy, informed decisions."

OEHHA developed these recommendations based on the levels of mercury and selenium found in fish caught in the lake. Historic mining and coal burning released mercury into the environment, where it can accumulate in fish. Because mercury affects brain development, particularly in developing children and fetuses, OEHHA provides advice tailored to two groups based on sex and age.

Selenium is an essential nutrient that is naturally present in the environment. However, high-level exposure to selenium can cause health problems such as hair loss, gastrointestinal distress, dizziness and tremors.

For Lake Casitas, OEHHA provides the following safe-eating advice:

Women (18–49 years) and children (1–17 years)

- May eat the following on a weekly basis:
  - Three total servings of sunfish species or Threadfin Shad, or
  - One total serving of black bass species or Common Carp.

Women (50 years and older) and men (18 years and older)

- May eat the following on a weekly basis:
  - Seven total servings of sunfish species, or
  - Three total servings of common carp or threadfin shad, or
  - Two total servings of black bass species.

One serving for adults is an 8-ounce fish fillet, measured before cooking, which is roughly the size and thickness of your hand. For small fish species, several individual fish may make up a single 8-ounce serving. Children should eat servings of less than 8 ounces. Eating fish in amounts slightly greater than the advisory's recommendations is not likely to cause health problems if it is done only occasionally, such as eating fish caught during an annual vacation.

A poster with safe-eating advice for Lake Casitas is available on OEHHA's website in both English and Spanish. For fish species found in Lake Casitas that are not included in this advisory, OEHHA recommends following its statewide advisory for eating fish from California lakes and reservoirs without site-specific advice.

OEHHA's fish advisory recommendations are based on the levels of contaminants, such as mercury, that persist in the environment and accumulate in fish. They are independent of any shorter-term advisories to limit fish intake due to freshwater or estuarine harmful algal blooms (HABs), which can produce toxins harmful to humans. Before fishing, check the California HAB Reports Map to see if there are HAB advisories and always practice healthy water habits.

The Lake Casitas advisory joins more than 150 other OEHHA advisories that provide site-specific, health-based fish consumption advice for many places where people catch and eat fish in California, including lakes, rivers, bays, reservoirs and the California coast. Advisories are available on OEHHA's Fish Advisories webpage.

OEHHA's mission is to protect and enhance the health of Californians and the environment through scientific evaluations that inform, support, and guide regulatory and other actions in the state.

For more information, contact Amy Gilson at Amy.Gilson@oehha.ca.gov.

Source: https://oehha.ca.gov/fish/press-release/press-release-fish/fish-advisory-lake-casitas-offers-safe-eating-advice-four

EPA News

The EPA Releases Draft Health-Based Recommendations for PFAS Levels in Bodies of Water

On December 19, 2024, the EPA announced draft national recommendations for health-based levels of per- and polyfluoroalkyl substances (PFAS) in waterbodies. Once final, these recommended criteria can be used by states and authorized Tribes to set water quality standards that help protect people from exposure through consuming water, fish and shellfish from inland and nearshore waterbodies that may be polluted by these PFAS.

The EPA's draft recommended human health criteria identify concentrations of three PFAS in a water body at or below where they are not expected to cause adverse human health effects from chronic (lifetime) exposure. The three chemicals are perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), and perfluorobutane sulfonic acid (PFBS). Human health criteria are not regulatory requirements and do not, on their own, compel any action. Rather they are information for entities, including state and Tribal regulators, to consider when making policy decisions that protect water quality.

Human health criteria are developed under Clean Water Act Section 304(a) and are based solely on the available data and scientific judgments about the impacts of pollutant levels in the water body (in this case PFAS) on people's health. Human health criteria are based on the latest scientific knowledge and do not consider economic impacts or the technological feasibility of meeting the chemical concentrations in ambient water, though Clean Water Act tools that use human health criteria may incorporate such factors.

The draft recommended human health criteria for PFOA, PFOS, and PFBS are based on the latest science, including final EPA human health assessments, fish consumption rates, drinking water intake rates, national bioaccumulation factors, and relative source contributions.

The EPA is accepting written comments from the public on the draft human health criteria through February 24, 2025. Learn more about EPA's draft human health water quality criteria.

For more information, contact the EPA Press Office at press@epa.gov.

Source: https://www.epa.gov/newsreleases/epa-releases-draft-health-based-recommendations-pfas-levels-bodies-water

Trends in Blood Methylmercury Concentrations in People of Childbearing Age

On December 23, 2024, the EPA published a report entitled *Blood Methylmercury and Fish Consumption Among People of Childbearing Age in the General U.S. Population*. This report presents the results of an EPA analysis of blood mercury and fish consumption data for 1999 through 2020 from the National Health and Nutrition Examination Survey (NHANES) for U.S. women 16-49 years of age. A key finding is that while the estimated amount of fish reported eaten in 2013-2020 was higher than in 1999-2010, the mercury concentrations in blood and estimated mercury intake from fish consumption was lower in 2013-2020 when compared to 1999-2010. This finding suggests that women of childbearing age are choosing to eat types of fish known to typically contain less mercury, leading to lower estimates of mercury intake per unit body weight in 2013-2020 when compared to NHANES 1999-2010.

For more information, contact the Samantha Fontenelle at fontenelle.samantha@epa.gov.

Source: https://www.epa.gov/choose-fish-and-shellfish-wisely/support-fish-and-shellfish-advisory-programs#trends

The EPA Releases Fish Images: Parts of Fish Should Not be Eaten if They Contain Contamination

On December 23, 2024, the EPA posted Fish Images to Use with Fish Advisories on its website which include an image of a fish conveying fish parts that should not be eaten if they contain contamination. The image is available in the following languages: Arabic, Amharic, Bengali, Cambodian, Chinese (Simplified and Traditional), English, French, Haitian Creole, Hmong, Japanese, Korean, Laotian, Polish, Portuguese, Russian, Spanish, Tagalog, Thai, and Vietnamese. There are two English versions; one of these is for Tribal members.

States, Territories and Tribes can use these images with fish consumption advisories to reach target audiences which include people who catch fish to share with others, buy locally caught fish to eat, or prepare fish for themselves or others to eat. These images are not meant to stand alone.

By issuing these images, the EPA believes it will be easier for states, territories and Tribes to reach out to their respective target audiences who are sensitive populations, e.g., pregnant people, children and people who are subsistence fish consumers. Individuals who are in a sensitive population as well as subsistence fish consumers are particularly susceptible to health effects from eating contaminated fish parts.

For more information, contact Sharon Frey at frey.sharon@epa.gov.

Source: https://www.epa.gov/choose-fish-and-shellfish-wisely/fish-images-use-fish-advisories

Updates to Webpages on EPA Guidance for Developing Fish and Shellfish Advisories

The EPA published a new set of webpages at the end of December 2024 to provide guidance for state, Tribal and territorial fish advisory programs when developing and issuing risk-based consumption recommendations for fish and shellfish to protect human health. Entitled *Building Fish and Shellfish Consumption Advisory Programs*, this updated web-based guidance replaces *Volume 1: Fish Sampling and Analysis, Third Edition of the Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories (2000)*. This resource will help states, Tribes and territories design a fish and shellfish contaminant monitoring program, collect and handle samples in the field, and process and analyze samples in the lab.

Several updates to the new, web-based version include:

- Monitoring approaches aligned with current state practices;
- Expanded species list to include tropical fish and additional species of shellfish;
- The July 2024 updated list of target contaminants to monitor; and
- Links to recommended analytical methods.

States, territories and Tribes should continue to use *Volume 2: Risk Assessment and Fish Consumption Limits* and *Volume 3: Risk Management* while additional webpages for these topics are under development.

For more information, contact the Katie Davis at davis.katie@epa.gov.

The EPA Issues Final Polychlorinated Biphenyls (PCBs) Reduction Plan for Spokane River

On October 29, 2024, the EPA issued its plan to reduce the amount of polychlorinated biphenyls (PCBs) in the Spokane River basin.

PCBs enter surface water through industrial and municipal wastewater, stormwater, groundwater, and atmospheric deposition, and readily accumulate in aquatic organisms. Even small amounts in the environment can pose health problems for people who consume fish.

"This plan charts a course for the Spokane River watershed that will bring greater health protections to those who eat significant amounts of fish," said Casey Sixkiller, Regional Administrator for the EPA's Region 10 office in Seattle.

The EPA committed to finalizing the plan in a legal agreement between the agency and the Sierra Club and Center for Environmental Policy and Law.

The agency's plan establishes a Total Maximum Daily Load (TMDL) for PCBs – often referred to as a pollution budget – to protect human health and aquatic life along the approximately 100 miles of the Spokane and Little Spokane rivers of Washington from the Idaho border to the confluence with the Columbia River.

Specifically, the new plan reduces the allowable concentration of PCBs discharged into the watershed from the current standard for the State of Washington of 7 picograms per liter to 1.3, the standard established by the Spokane Tribe of Indians in 2013.

PCBs concentrations in the Spokane River range from about 30 picograms per liter near Post Falls, Idaho to well over 150 picograms per liter through Spokane Valley and into Long Lake (also known as Lake Spokane) in Washington.

Next, the Washington Department of Ecology will use this budget to develop an implementation plan to achieve the goals of the TMDL. In practical terms, the new TMDL for the Spokane River Basin will mean a concerted effort in Washington and western Idaho to reduce PCBs through measures such as stormwater controls and stricter limits for PCBs in state-issued permits for wastewater treatment plants and industrial facilities.

The EPA recognizes that the TMDL limits are low, not currently measurable by an EPA-approved method, and in the near term will be very challenging to meet. However, the EPA supports Ecology's gradual tightening of PCBs limits in discharge permits as technologies mature.

Idaho's water quality standards require their Clean Water Act programs to meet downstream water quality standards, including those in another state.

Dischargers in the Spokane River watershed have made significant strides in reducing PCBs through wastewater treatment plant upgrades, stormwater retrofits, and regional efforts by the Spokane River Toxics Task Force and

Spokane Toxics Advisory Committee. Continuation of these efforts will be particularly important in the heavily industrialized Spokane Valley.

The EPA recently provided close to $7 million in grant funds to the Washington Department of Ecology as part of the Columbia River Basin Restoration Program for toxics reduction in the Spokane River basin, which includes funds to develop a regional plan specific to the Spokane River and for on-the-ground implementation activities after the plan is developed.

Prior to being banned in 1979, PCBs were widely used by multiple industries in dyes, paints, plastics, caulking, fluorescent lights ballasts, electrical transformers, and many other industrial and consumer applications. PCBs are found throughout watersheds around the world.

For more information on the plan, go to: https://www.epa.gov/tmdl/spokane-river-pcb-tmdls.

For more information, contact Bill Dunbar at dunbar.bill@epa.gov.

Source: https://www.epa.gov/newsreleases/epa-issues-final-pcbs-reduction-plan-spokane-river

Biden-Harris Administration Makes Unprecedented Progress to Protect Communities from PFAS Pollution

New report highlights key EPA accomplishments under national strategy to confront PFAS "forever chemicals" in communities across the country

On November 14, 2024, under the leadership of President Biden and Vice President Harris, the EPA delivered bold and concrete actions to protect people from PFAS, or per- and polyfluoroalkyl substances, in their water and everyday lives while dramatically increasing investments in research and solutions. Specific actions and progress are detailed in EPA's third annual progress report highlighting the significant achievements the agency has made under its PFAS Strategic Roadmap and the Biden-Harris Administration's whole-of-government strategy to protect communities from the impacts of forever chemicals.

"Before President Biden took office, the federal government wasn't doing enough to address PFAS pollution across the country. The Biden-Harris Administration has since taken unprecedented steps to develop the science, implement strong standards, and invest billions into solutions to protect all Americans from these forever chemicals," **said EPA Administrator Michael S. Regan.** "Our actions are making a difference in communities across America, and especially in those that have been overburdened by pollution for far too long."

PFAS are an urgent threat to public health and the environment. Communities across the nation are discovering these chemicals in their air, land, and water. The science is clear: exposure to certain PFAS poses significant risks to human health, including cancer, even at very low levels. In 2021, EPA Administrator Michael S. Regan established the EPA Council on PFAS and charged the group to develop the agency's strategic roadmap. The roadmap is the EPA's commitment to confront PFAS contamination head on – by following the science, leveraging all available

tools and authorities, holding polluters accountable, and investing historic levels of resources to protect communities.

Progress on PFAS During the Biden-Harris Administration

- **Protecting drinking water:** In 2024, the EPA announced the first-ever, nationwide, legally enforceable drinking water standards for PFAS. The final rule will reduce PFAS exposure for approximately 100 million people, prevent thousands of deaths, and reduce tens of thousands of serious illnesses. Since early 2021, the EPA has also been undertaking the largest nationwide effort to understand the frequency that PFAS is found in drinking water, and at what levels. Under this program, the EPA is collecting, and making publicly available, data on 29 different PFAS in drinking water at approximately 10,000 water systems nationwide.
- **Investing in projects to address PFAS contamination in water:** Through President Biden's Bipartisan Infrastructure Law, the EPA is investing $10 billion for removal of PFAS and other emerging contaminants from water. Most of this funding is helping communities install new infrastructure and treatment technologies to address PFAS in drinking water. The EPA also announced its Fiscal Year 2024 funding allocations for EPA's Tribal infrastructure financing programs for PFAS and other emerging contaminants, including more than $35 million for drinking water and $4.5 million for clean water.
- **Cleaning up PFAS contamination on lands:** The EPA is making sure that polluters pay for the cleanup of PFAS contamination. In 2024, the EPA finalized a critical rule designating PFOA and PFOS as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as Superfund, to compel those most responsible for PFAS contamination to pay for cleanup, rather than taxpayers.
- **Advancing chemical safety:** The EPA has taken action to harness the authorities of the Toxic Substances Control Act and other laws to protect people from PFAS and account for risks to vulnerable subpopulations. For example, the EPA finalized a rule to prevent inactive PFAS from reentering commerce. This stops companies from starting or resuming the manufacture or processing of 329 PFAS that have not been made or used for many years without a complete EPA review and risk determination. For PFAS that were previously reviewed, the EPA has issued rules to ensure any protective restrictions are more broadly applicable to all manufacturers and processors of those chemicals.
- **Safeguarding our waterways:** The EPA put critical building blocks in place for understanding and addressing PFAS in our nation's waters. The EPA finalized the development of two critical methods for measuring PFAS in air, water, soil, and other environmental media. The agency finalized water quality criteria for PFOA and PFOS as well as benchmarks for other PFAS to protect aquatic life. The EPA also released a recommended list of PFAS to monitor for state and Tribal fish and shellfish advisory programs.
- **Pursuing enforcement and compliance:** The EPA established a clear PFAS Enforcement Discretion and Settlement Policy Under CERCLA to reinforce the agency's focus on significant contributors to the PFAS contamination challenge – and not on entities like farms or water utilities. The EPA also instituted a new National Enforcement and Compliance Initiative, Addressing Exposure to PFAS, to focus its resources and attention on enforcement actions that protect public health.
- **Advancing our understanding of PFAS:** The EPA catalyzed numerous research and regulatory programs to collect and generate data on PFAS that will improve scientific understanding of this large and diverse class of chemicals. The EPA also developed, implemented, and refined the agency's National PFAS Testing Strategy, which is building information on categories of PFAS to inform future decisions. These efforts complement an ongoing and rigorous research agenda.
- **Reducing PFAS in products and purchasing:** The EPA has taken significant action to reduce PFAS uses in commerce through efforts to remove PFAS as a class of chemicals rather than only a few chemicals at a time. Additionally, the EPA has ensured that PFAS are not intentionally added to Safer Choice-certified

products and has removed PFAS from the list of inert ingredients approved for use in nonfood pesticide products. The agency also joined the General Services Administration (GSA) in taking action to cut PFAS from U.S. government custodial contracts.

The progress the Biden-Harris Administration has made to protect communities from PFAS pollution is unprecedented. The EPA will continue to move with urgency to develop the science and research related to PFAS, partner with states, Tribes, and local leaders to implement funding and solutions, and set and update strong standards to ensure all Americans are safe from potential contamination.

Read the PFAS Strategic Roadmap - EPA's Commitments to Action 2021-2024.

For more information, contact EPA Press Office, press@epa.gov.

Source: https://www.epa.gov/newsreleases/biden-harris-administration-makes-unprecedented-progress-protect-communities-pfas

Other News

Building Bridges to Restore Connectivity: Penobscot Nation and National Oceanic and Atmospheric Administration (NOAA) Fisheries Improve Atlantic Salmon Resilience

On November 5, 2024, the National Oceanic and Atmospheric Administration announced that the Penobscot Nation received multiple grants from the NOAA Species Recovery Grants to Tribes Program to increase habitat connectivity in the Penobscot River watershed to aid the return of Atlantic salmon to Tribal lands.

The Penobscot Nation conserves and recovers endangered Atlantic salmon and facilitates their return to Tribal lands. The Nation completes these conservation efforts with help from the NOAA Fisheries' Species Recovery Grants to Tribes Program. Their latest project focuses on restoring aquatic habitat connectivity to promote the species' resilience in the face of climate change.

The Importance of the Penobscot River Watershed

For thousands of years, the Penobscot River has served as a highway for the Penobscot people who live along its banks. To this day, the river provides food for the community, is central to their culture, and is considered a Tribal citizen. "We hunt and fish and gather there, and we respect the river as our relative who provides sustenance to us," said Chuck Loring, a member of the Penobscot Nation and the Director of the Tribe's Department of Natural Resources. The Penobscot River is now one of the last places in the United States where endangered Atlantic salmon live. The species is important to the Nation.

Atlantic salmon once migrated inland by the hundreds of thousands to rivers in the northeastern United States. Beginning in the 1800s, dam construction along the Penobscot River severely reduced fish passage. Later, undersized culverts prevented fish passage throughout tributaries including headwater streams. Atlantic salmon

face many threats in the northeast United States due to dams, including warming waters, high predation from species such as smallmouth bass, and modified habitats.

Free-flowing and connected rivers are vital to anadromous fish such as Atlantic salmon, providing uninterrupted migration between freshwater and the ocean. This connectivity ensures that the salmon can hatch in the river, mature in the ocean, and return to spawn in the waters in which they were born. Sea-run fish also play an important role in the ecosystem by carrying nutrients and energy from the ocean to the rivers. For example, when they die, Atlantic salmon bodies provide nutrients such as nitrogen and phosphorus to the river system. Maintaining connected rivers is essential not only for the survival of Atlantic salmon but also for the health and productivity of the ecosystem.

Dams Block Salmon from Reaching Habitat

Dams and barriers can block, delay, and kill Atlantic salmon and destroy freshwater spawning and nursery habitats, unless they are removed or equipped with adequate fish passage. Today, more than 400 dams along rivers and streams block or impair migration corridors and alter habitat conditions that impede both the survival and recovery of Atlantic salmon. Salmon populations have greatly diminished, with around 1,500 fish returning to Maine rivers in 2023. The West Branch of the Penobscot River was one of the most important, abundant, and historical salmon habitats. However, today it largely remains inaccessible to salmon because of numerous dams that lack fish passage; dams are one of the principal causes of their decline. The Penobscot Nation's efforts aim to restore these vital "highways" for salmon and other sea-run fish to thrive.

Ongoing Efforts to Restore Salmon Habitat

Culverts can block fish passage or impair migration and destroy habitat by changing streamflows and altering stream channels. However, bridges support more natural stream features, such as water depth and flow speed. This enables fish passage, improves Atlantic salmon habitat, and provides protection for Atlantic salmon eggs. Under the Species Recovery Grants to Tribes program, the Penobscot Nation has successfully replaced culverts with bridges at two road-stream crossings in the Mattamiscontis Stream. Support from the program has allowed the Nation and project partners to complete another 16 connectivity projects since 2011. Together, these projects are helping to reconnect the upper reaches of Mattamiscontis Stream to the Penobscot River.

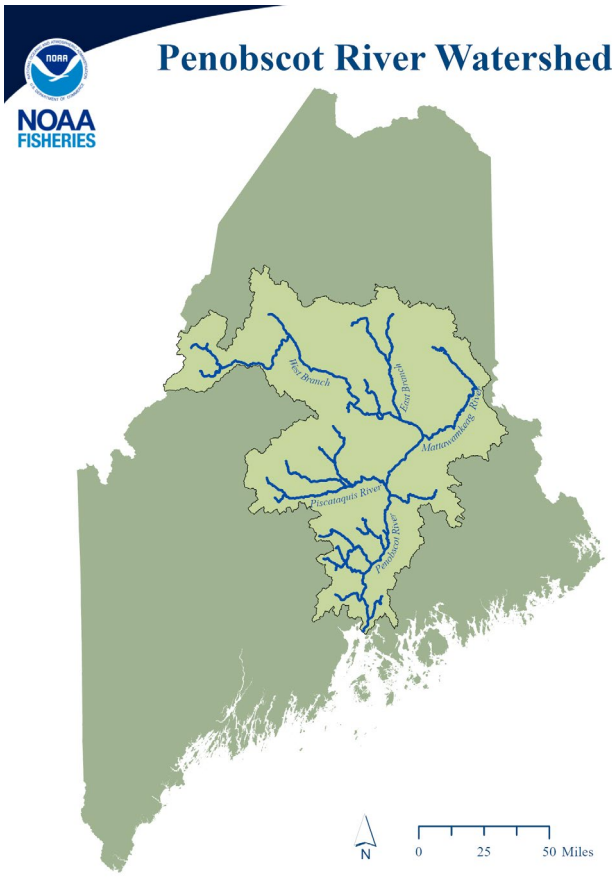
The Penobscot Nation has also increased their participation in the Atlantic Salmon Collaborative Management Strategy. The Strategy establishes a platform for effective communication and collaboration between multiple partners. The Nation's voice is important in this process. Their involvement facilitates the implementation of the 2019 Final Recovery Plan for the Gulf of Maine Distinct Population Segment of Atlantic Salmon. This work is critical in supporting ecosystem-wide restoration for the recovery of Atlantic salmon and requires the collective efforts of many partners.

The Nation's participation in the Strategy provides an opportunity for the integration of Traditional Ecological Knowledge (also known as Indigenous Knowledge). This allows the Nation to voice their cultural perspectives, while advocating for essential dam fish passage structures and operational practices. Traditional Ecological Knowledge offers a profound understanding of local environmental changes and ecological patterns that modern science alone might not fully capture.

As Dan McCaw, the Fisheries Program Manager for the Penobscot Nation, emphasizes, "The Tribal people stewarded these rivers since time immemorial and had some of the most robust fish runs in the world. They continue to manage forests very conservatively. There's a huge benefit of bringing in Traditional Ecological Knowledge and weaving it with modern science in a very respectful way. This integration is not always simple or easy, but it ensures that the Tribe has an important voice in the recovery effort."

In 2023, the Nation's (and their partners) efforts led to the highest return of Atlantic salmon to the Penobscot River in more than a decade. These efforts also have benefits to other sea-run species. Improved fish passage on the Mattamiscontis Stream enabled river herring (alewives and blueback herring) to reach spawning lakes that could support nearly 800,000 fish. River herring are prey for many birds and other fish, such as bald eagles and striped bass, so their resurgence may serve to buffer juvenile Atlantic salmon from predators.

NOAA Fisheries further supports the Penobscot Nations' work through the Bipartisan Infrastructure Law and Inflation Reduction Act. This funding supported construction of fish passage projects on Birch Stream, a tributary of the Penobscot River. These projects will improve access to additional cold-water habitat for Atlantic salmon. The Bipartisan Infrastructure Law funding will also support the construction of a hiking trail along Sam Ayers Stream on Tribal lands later this year. The trail will highlight recent and future restoration projects through informational kiosks. The Penobscot Nation is hopeful that increasing opportunities for Tribal and non-tribal members to see and access the restored lands and kiosks will continue public support and engagement for important ongoing and future restoration projects.



The Penobscot River, one of New England's largest watersheds, is obstructed by numerous dams, culverts, and other barriers that hinder sea-run fish. Efforts led by the Penobscot Nation and others are underway to restore access to the river's upper reaches. Credit: NOAA Fisheries (*Photo courtesy of NOAA Fisheries*)

Building Resilience for Climate Change

Climate change exacerbates the urgency of the Nation's restoration work to increase Atlantic salmon's resilience. Restoring free-flowing rivers and streams aligns with traditional practices and enhances ecosystem and infrastructure resilience in the face of climate change. Projected increases in precipitation and more frequent intense storms in the Northeast United States pose significant risks. For example, flooding in December 2023 highlighted the growing threats associated with these changes in Maine. These road-stream crossing projects help to mitigate flood risks by supporting wider ranges of water flows and improving fish passage. By integrating Traditional Ecological Knowledge into the management of the river system, the Penobscot Nation is better prepared

to address these climate challenges. As climate change intensifies, these proactive restoration efforts are crucial for sustaining Atlantic salmon populations and maintaining the health of the ecosystem while protecting critical infrastructure.

Despite significant progress, much work remains to recover Atlantic salmon populations in Maine. With support from NOAA's Species Recovery Grants to Tribes Program, the Penobscot Nation continues its restoration efforts for Atlantic salmon populations in the Penobscot River watershed. These efforts align with NOAA Fisheries' broader vision to restore habitats and reopen migratory routes, ensuring fish access to healthy environments.

Chuck Loring highlights the Penobscot Nation's commitment to restoration: "The Tribe takes a seven-generation approach to conservation. That's our motivation to work hard now. I might not be able to see the results, but my descendants will."

For more information, contact Office of Protected Resources at (301) 427-8400.

Source: https://www.fisheries.noaa.gov/feature-story/building-bridges-restore-connectivity-penobscot-nation-and-noaa-fisheries-improve

Massachusetts Department of Fish & Game Unveils Five-Year Strategic Plan

"Connections: Working Together for Nature" establishes a bold and unifying vision for the Department, focusing on solutions at the intersection of biodiversity, climate change, and environmental justice.

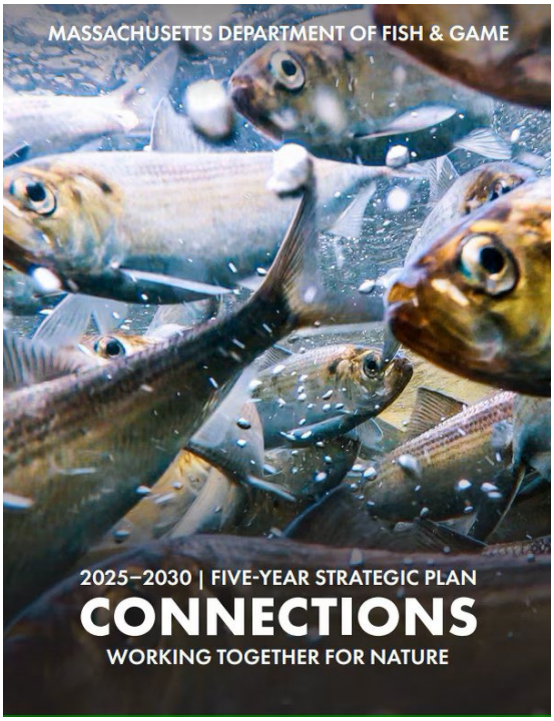
On August 16, 2024, the Massachusetts Department of Fish and Game (DFG) announced the release of a five-year strategic plan, Connections: Working Together for Nature to guide to the agency's work from 2025-2030. The plan establishes a bold and unifying vision for the Department, focusing on solutions at the intersection of biodiversity, climate change, and environmental justice while advancing the priorities of the Healey-Driscoll Administration and Executive Office of Energy and Environmental Affairs (EEA).

"I commend the team at the Department of Fish and Game for bringing the full force of the agency to combatting climate change and protecting our most precious natural resources," **said Governor Maura Healey.** "Under the new strategic vision led by Commissioner Tom O'Shea, the Department is taking action to ensure Massachusetts' rich ecosystems and diverse wildlife thrive and are accessible to all."

"Everyone deserves the ability to explore and find joy in our natural world," **said Lieutenant Governor Kim Driscoll.** "With this clear focus, more people, especially those living in environmental justice communities, will be able to enjoy the many wonders Massachusetts has to offer."

"We are proud to see Department of Fish and Game take a forward-looking, action-oriented approach to aligning their day-to-day work with the administration's priorities of biodiversity conservation, clean energy, and environmental justice," **said EEA Secretary Rebecca Tepper.** "This vision will forge a future of thriving ecosystems, resilient communities, and equitable access to nature."

"What we do today will not only improve the quality of life in Massachusetts, but will strengthen our legacy of national leadership and create positive momentum for future generations. This plan reflects our agency's commitment to respond with urgency to the most pressing challenges of today: unprecedented biodiversity loss, the climate crisis, and persistent environmental injustice," **said Department of Fish and Game Commissioner Tom O'Shea.** "By aligning our efforts, this plan will allow our Department to rise to these challenges, expand our impact, and above all, better serve the people of Massachusetts. We are deeply grateful for the support of the Healey-Driscoll Administration and Executive Office of Energy and Environmental Affairs Secretary Rebecca Tepper and the contributions of our staff that developed such a bold, ambitious, and inspiring path forward."



Cover page of Connections, a five-year strategic plan surrounding fish and game. (*Photo courtesy of the Massachusetts Department of Fish and Game*)

Since its inception, DFG has been dedicated to conserving fish and wildlife for the benefit of all people. The Department has significantly expanded its efforts in endangered species recovery, sustainable management of fisheries, land conservation and habitat management, restoration of rivers, wetlands, and streams, and enhanced work to connect with the public through recreation, education, and public access. While the Department maintains its commitment to conserve fish and wildlife and continue the long traditions of hunting, fishing, boating, and other outdoor recreation, this strategic plan outlines priority areas for growth and expansion.

The Department has identified key priorities, which include developing nation-leading biodiversity conservation goals for 2030, 2040, and 2050, as called for by Governor Maura Healey's Executive Order No. 618. The agency will double the pace of land protection, working to protect an average of 6,000 acres per year, to support the state's goal of conserving 40 percent of Massachusetts land by 2050. Additionally, the Department will complete five landscape-scale conservation projects, expand river and wetland restoration efforts, promote carbon storage and sequestration, and develop decarbonization and resilience plans for all facilities.

The Department will also work to meaningfully connect with environmental justice and Indigenous communities by creating new inclusive recreation opportunities for underserved and environmental justice communities, increasing accessibility and use of Department programs, facilities, and resources, and improving language access. The Department will foster respectful, mutually beneficial partnerships with Indigenous peoples and collaborate with Tribes to identify resources they may wish to access for traditional and cultural uses. Finally, the Department will increase food security by expanding venison donations, connecting environmental justice communities with fresh, local seafood, and increasing Harmful Algal Bloom monitoring by 25 percent to ensure sustainable shellfish harvest.

The strategic plan was created collaboratively across the four Divisions—Division of Ecological Restoration (DER), Division of Fisheries & Wildlife (MassWildlife), Division of Marine Fisheries (DMF), and Office of Fishing &

Boating Access (OFBA) and with input from the Fisheries & Wildlife Board and Marine Fisheries Advisory Commission (MFAC).

"DER is proud to be a part of this groundbreaking plan for the next five years. Climate change is bringing significant challenges to our communities: extreme weather, increased precipitation, and catastrophic flooding," **said Division of Ecological Restoration Director Beth Lambert.** "We are excited to scale up our river and wetland restoration efforts to help people and nature adapt—increasing capacity at the local level and leveraging new and existing partnerships to expand our impact."

"The Department of Fish and Game's Strategic Plan is an important first step that clearly lays out for the public what the Department's and MassWildlife's key priorities are, including but not limited to biodiversity and landscape-scale conservation through partnerships, land protection, habitat restoration and management, expanding fishing and hunting opportunities, access to nature and wildlife for all to enjoy, and expanding "Hunters Share the Harvest" to help address food security needs in the Commonwealth," **said MassWildlife Director Mark S. Tisa.**

"Our fisheries and seafood industry are the backbone of the state's coastal economy and coastal culture—they provide fresh, local, healthy food and bolster tourism in Massachusetts," **said DMF Director Daniel McKiernan.** "I applaud the Department's leadership in the development of this plan to provide us with the framework and support to expand DMF's work to protect and enhance marine habitats and riverways, improve water quality, and sustainably manage the state's marine fish resources to support robust fish populations and mitigate the impacts of climate change."

"OFBA is committed to advancing this plan's vision for equitable access for all to the Commonwealth's coastal waters, great ponds, and rivers," **said OFBA Acting Director Terrance Smith.** "We strive to support this by creating new public access facilities near underserved or environmental justice communities, increasing use and accessibility of the 300+ facilities we maintain statewide, improving language access for facilities and signage, and growing partnerships with the communities we serve."

"The Fisheries and Wildlife Board is proud to support MassWildlife's comprehensive mandate to ensure the conservation of the Commonwealth's natural resources for the use and enjoyment of all people. The Board appreciated the opportunity to engage during the development of the Department of Fish and Game's Strategic Plan and applauds the plan's commitments to expanding access to outdoor recreation through learn-to-fish and -hunt programs, connecting people to nature with wildlife education programs, and to environmental justice across all programs," **said Stephen Sears, Chair of the Fisheries and Wildlife Board.**

"As chair of the MFAC, I am happy to see a focus of this plan on addressing marine productivity, fish passage, coastal wetlands restoration, and increasing access to the Commonwealth's fish and shellfish resources," **said Raymond Kane Jr., Chair of the MFAC.** "Providing support for these goals is critical to ensuring we maintain our world-class recreational fisheries and seafood industry that provide broad access to healthy, fresh, and local seafood."

"Huge kudos to the Department of Fish & Game for prioritizing connections as a foundational necessity when addressing biodiversity loss, the negative impacts of climate change, and environmental justice and the nature gap," **said David O'Neill, President and CEO of Mass Audubon** "In its five-year strategic plan, DFG recognizes that achieving our strategic goals at the intersection of these crises cannot be accomplished with a 'stay in your own lane' approach but requires a 'share the road' collaborative mindset. Mass Audubon fully supports this enlightened plan and the conservation priorities of the Healey-Driscoll Administration."

"The Nature Conservancy thanks the Healey-Driscoll Administration for its leadership on addressing the three global crises of our time—biodiversity loss, climate change, and environmental justice," **said Manikka Bowman, Executive Director of The Nature Conservancy in Massachusetts.** "Our health and well-being, and that of future generations, are tightly tied to the health and resilience of our natural world. Climate solutions and biodiversity conservation are one and the same."

"We commend the Department of Fish and Game for presenting a bold and achievable strategic plan anchored in three critical themes, all unified by the concept of 'connections. As hunters and anglers, we deeply value our intrinsic bond with nature and the many ways it sustains us. We eagerly welcome the opportunity to collaborate with the Department to bring this strategic vision to life," **said Christopher Borgatti, Eastern Policy & Conservation Manager for Backcountry Hunters & Anglers.**

To explore the Department of Fish & Game's Strategic Plan for 2025-2030 and see the timeline for implementation, visit mass.gov/DFG-strategicplan.

For more information, contact Julia E. Hopkins at julia.e.hopkins@mass.gov.

Source: https://www.mass.gov/news/massachusetts-department-of-fish-game-unveils-five-year-strategic-plan

Recently Awarded Research

The U.S. Fish and Wildlife Service Awards More Than $1.3 Million in Tribal Wildlife Grants to Alaska Tribes

Service Awards More Than $1.3 Million in Tribal Wildlife Grants to Advance Shared Conservation Goals and Natural Heritage, Cultural Priorities in Alaska

Awards Will Support Eight Tribes and Bolster Fish and Wildlife Conservation

On October 17,2024, the U.S. Fish and Wildlife Service announced it awarded more than $1.3 million to federally-recognized Tribes in Alaska to benefit fish and wildlife resources and their habitats. Recipients include:

Native Village of Brevig Mission
Watershed Assessment & Long-term Subsistence Habitat Protection for Hot Springs, Glacier Canyon, and Graphite Creeks in Alaska's Seward Peninsula

The goal of this project is to provide long-term protection of the Native Village of Bervig Mission's and other Imuruk Basin Native Villages' culture and subsistence fish and wildlife resources and their habitat which are

impacted by potential mining activities and exacerbated by more frequent extreme weather events within the Imuruk Basin Watershed and Norton Bay.

Chilkat Indian Village
Mapping Critical Salmon Habitats and Populations of the Chilkat Watershed

This project will create the first detailed map of strontium isotope variation across the watershed's rivers, providing a new tool for tracking fish populations and critical habitats in the Chilkat River watershed.

Chilkoot Indian Association
Utilizing Environmental DNA (eDNA) to Monitor Tribally Important Fisheries Populations within Deishú, Alaska

The Chilkoot Indian Association will build Tribal capacity to monitor Tribally-important fish and wildlife populations using eDNA through the establishment of an Environmental Lab in Deishú, Alaska (present-day Haines, Alaska).

Chickaloon Native Village
Chickaloon Native Village Historical and Contemporary Salmon Research Project

This project will describe the run timing, enumeration, and species composition of adult Alaska salmon in Moose Creek, quantify juvenile salmon abundance in Premier Creek prior to restoration work, perform a fish health survey on Moose Creek, document and non-lethally sample genetic tissue from salmon in water bodies around the traditional homelands of the Chickaloon people to contribute to the Alaska Anadromous Waters Catalog and Genetic Baseline Collection, quantify marine-derived nitrogen and historical salmon DNA at culturally relevant fishing locations, and build program capacity for additional fisheries projects in the future.

Native Village of Eklutna
Eklutna River Salmon Population Monitoring and Fish Weir Project Plan Development

The Native Village of Eklutna will continue to monitor salmon population trends and habitat use by juvenile and adult salmon within the Eklutna River, continue the collection of genetic samples of salmon to help assess population viability, develop a fish counting weir project plan for future implementation, and present findings to management agencies and other partners to facilitate sound management decisions and ensure timely actions are taken.

Hoonah Indian Association
Video Monitoring of Sockeye Salmon in Hoktaheen Watershed

The Hoonah Indian Association aims to fill significant data gaps by installing and operating a fish weir with a video monitoring system to begin building complete and accurate records of Sockeye and other important fish species in the Hoktaheen system. Additionally, this project will begin year-round monitoring of water quality and temperatures in the main creek and lakes to further build a better understanding of the watershed and identify concerns and potential future restoration or enhancement projects in the area to increase resiliency to climate change and ensure food security for the people who use this system for up to 80% of their subsistence salmon needs.

Sitka Tribe of Alaska

Artificial Intelligence for Subsistence Salmon Monitoring and Management

The Sitka Tribe of Alaska will partner with Wild Salmon Center and the US Forest Service to install artificial intelligence (AI)-enabled video chutes to produce automated real-time counts of Redoubt Lake sockeye salmon for a fraction of the cost of traditional weirs. Sitka Tribe of Alaska and US Forest Service staff will use a web app to review video clips and train a deep learning model to accurately identify and count Redoubt salmon. Once the model meets accuracy targets, it will substantially reduce long-term monitoring costs and be able to generate accurate in-season salmon counts in real-time with minimal human input.

Sun'aq Tribe of Kodiak

Population Evaluation of Migratory Emperor Geese and Aleutian Terns on the Kodiak Island Roaded Area, Alaska

This project will directly aid in conservation of migratory emperor geese and Aleutian terns (critically important subsistence species) within the Kodiak Island Roaded Area through collection of necessary population-level abundance and health data and will inform future harvest management decisions and conservation strategies, including habitat protection. Important staging areas for both species will be documented and used to develop the "Kodiak Island Roaded Area emperor goose and Aleutian tern status report and habitat conservation strategies" which will identify areas in need of greater protection. Investigation of anthropogenic contaminants (heavy metals), infectious disease (highly pathogenic avian influenza), and naturally occurring environmental toxins (associated with harmful algal blooms) will also be investigated and documented.

Tribal Wildlife Grants

The Tribal Wildlife Grants Program helps fulfill federal trust responsibilities and achieve Tribal sovereignty by expanding Tribes' natural resource capacity. Since its inception in 2003, including this year's grants, the competitive Tribal Wildlife Grants Program has awarded more than $124.5 million to Native American and Alaska Native Tribes, providing support for 697 conservation projects.

Tribal Wildlife Grants help Tribes develop increased management capacity, improve and enhance relationships with conservation state partners, address cultural and environmental priorities, and help train the next generation of conservationists by engaging Tribal students interested in fisheries, wildlife and related fields of study. Some grants have been awarded to support recovery efforts for federally listed threatened and endangered species.

Eulachon migrating upstream in Alaska. (*Photo courtesy of the Chilkoot Indian Association and the U.S. Fish and Wildlife Service*)

The grants are provided exclusively to federally recognized Native American and Alaska Native Tribal governments and are made possible under the Related Agencies Appropriations Act of 2002 through the State and Tribal Wildlife

Grants program. To learn more about the grant program and application process, please visit: https://www.fws.gov/service/tribal-wildlife-grants.

For additional information about the Service's Native American Programs, visit: https://www.fws.gov/program/native-american.

Learn more about the Office of Conservation Investment.

For more information, contact the U.S. Fish & Wildlife Service at 1-800-334-9453 or Katrina Liebich here.

Source: https://www.fws.gov/press-release/2024-10/us-fish-wildlife-service-awards-more-13-million-tribal-wildlife-grants-alaska

$9.2 Million in Inflation Reduction Act Funds Awarded to Academic Partners for Pacific Salmon Recovery Science

Partnerships are key to strengthening NOAA's science-based approach toward recovering imperiled Pacific salmon populations.

On November 13, 2024, NOAA Fisheries announced that it awarded more than $9.2 million in grants funded by the Inflation Reduction Act to academic partners that will help recover threatened and endangered Pacific salmon. These grants are part of the Biden-Harris Administration's unprecedented $27 million investment in Pacific salmon recovery science. They will support research that will build upon decades of knowledge from NOAA and its state, tribal, and academic partners.

"The Inflation Reduction Act funding allows us to engage our academic partners and make rapid scientific advancement in critical areas," said Steve Lindley, director of the Southwest Fisheries Science Center's Fisheries Ecology Division in Santa Cruz, California.

NOAA awarded six grants to four NOAA cooperative institutes. The largest ($7.48 million) was awarded to the University of California at Santa Cruz (UC Santa Cruz) via the Cooperative Institute for Marine, Earth and Atmospheric Systems. UC Santa Cruz researchers across disciplines, including molecular ecology, fisheries biology, and climate science, will work closely with NOAA scientists through the Fisheries Collaborative Program. They will produce transformative research in support of NOAA's science-based salmon recovery plans.

Researchers with the Fisheries Collaborative Program at the University of California at Santa Cruz deploy equipment to measure predation rates on juvenile salmon in the Sacramento-San Joaquin Delta. (*Photo courtesy of Brendan Lehman and NOAA Fisheries*)

"Transforming the future for Pacific salmon requires new thinking, and that is where the UC Santa Cruz -NOAA collaboration really shines," said Eric Palkovacs, professor and director of the Fisheries Collaborative Program at UC Santa Cruz. "We have fully integrated research teams working on the biggest challenges, developing and field testing new restoration approaches."

Advancing Science to Save Salmon

Salmon exist across a range of ecosystems, from mountain rivers to the open ocean, and face a variety of threats throughout their lives. This presents enormous challenges for their recovery. This funding will help scientists better understand these pressures, strengthening current knowledge and advancing the cutting edge of salmon science to support recovery.

"The aim of the work is to create new tools that can evaluate the effectiveness and cost of different recovery strategies and fill critical information gaps," said Lindley. "This will include work across all the habitats that salmon use over the course of their lives — rivers, estuaries, and the ocean."

The grants include support for undergraduate and graduate student researchers and postdoctoral scholars, representing a crucial investment by NOAA in training the next generation of scientists.

"I am very fortunate to collaborate with such an incredible network of scientists at both UC Santa Cruz and NOAA," said Paige Gardner, a graduate student researcher at UC Santa Cruz.

Gardner is studying the genetic underpinnings of heat tolerance in steelhead to reveal which populations might be most resilient to climate change. Her work, alongside dozens of other Inflation Reduction Act-funded projects, will inform cohesive tools to improve forecasts of salmon returns and identify impactful recovery actions.

Partners in Salmon Recovery

The other cooperative institutes are located at the University of Washington, Oregon State University, and Woods Hole Oceanographic Institute. NOAA partners with 16 cooperative institutes, which include 80 universities across 33 states.

Salmon are a vital resource along the West Coast, with important cultural, economic and ecosystem benefits. Overfishing, climate change, predation, and loss of habitat have pushed some populations to the brink of extinction. Currently, salmon and steelhead are considered threatened or endangered across much of their native range along the Pacific Coast. NOAA is striving to bring these populations back to sustainable levels to support fisheries, tribal treaty obligations, and ecosystems.

For more information, contact Michael Milstein at michael.milstein@noaa.gov.

Source: https://www.fisheries.noaa.gov/feature-story/92-million-inflation-reduction-act-funds-awarded-academic-partners-pacific-salmon

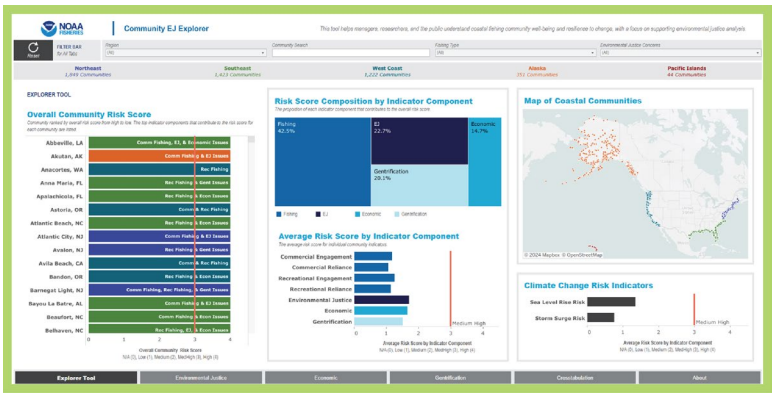
Tech and Tools

New Tool Provides Insight into Coastal Community Well-Being

The Community Environmental Justice Explorer provides insights into coastal community conditions and can be used as a signal for further investigation.

On October 28, 2024, NOAA Fisheries reported that it is working to integrate equity and environmental justice into all they do, noting that gaining a better understanding of the people who rely on fisheries in the United States has never been more important.

NOAA Fisheries social scientists have launched the new Community Environmental Justice Explorer web tool. It describes environmental justice concerns for nearly 5,000 coastal communities in the United States. By visualizing indicators, such as fishing dependence, gentrification pressure, and poverty, this tool creates a dashboard to explore and compare the different pressures coastal communities can face.



A view of the Community Environmental Justice Explorer tool. (*Photo courtesy of NOAA Fisheries*)

This web tool helps managers, researchers, and the public understand environmental justice concerns. One future user, Corey Ridings, who represents the open California Seat of the Pacific Fishery Management Council, shares her perspective: *"Equitable and just U.S. fisheries require a transparent understanding and knowledge of who is benefiting from our ocean. Tools such as the Community Environmental Justice Explorer can help us get there by supporting communities in educating themselves, participating in decision-making, and holding their government accountable."*

Among the nearly 5,000 coastal communities identified in the tool, more than 650 communities are engaged in or reliant on commercial fishing in a "medium to high" capacity. Commercial fishing activities are integral to how these communities function and experience day-to-day life. These communities face environmental justice concerns at the same or higher rates than other coastal communities:

- **39 percent** have population compositions that have historically had more environmental justice concerns (the same as in other coastal communities)
- **49 percent** experience more poverty (compared to 32 percent of other coastal communities)
- **48 percent** experience more personal disruptions (compared to 36 percent of other coastal communities)

The tool supports their ongoing social indicators efforts and the U.S. Ocean Justice Strategy. It helps to address the goals of NOAA Fisheries' Equity and Environmental Justice Strategy. It also supports mandated environmental justice analyses and assessments related to social impact, environmental justice, ecosystem-based fisheries management, natural disasters, and climate change.

The new tool's capabilities build upon and complement the Community Social Vulnerability Indicators Tool, especially in supporting environmental justice analysis.

For more information, contact swfsc.info@noaa.gov.

Source: https://www.fisheries.noaa.gov/feature-story/new-tool-provides-insight-coastal-community-well-being

New Calculator Helps Oyster Growers Measure the Water Quality Benefits of Farms

The new tool provides a science-based estimate of how much nitrogen oyster farms remove from local waterways. It generates a report that can be used in the aquaculture permitting process.

On October 28, 2024, Scientists from the Northeast Fisheries Science Center and the National Centers for Coastal Ocean Science created an online tool for oyster growers in the Northeast United States which they can use to get a science-based estimate of how much nitrogen their farms remove from local waterways. The publicly available Aquaculture Nutrient Removal Calculator also generates a report that growers can include in their aquaculture permit applications. The team published the science behind this new tool in the journal *PLOS ONE* (open access). They are actively seeking feedback from the shellfish aquaculture community to help improve the tool. Send feedback to: es.tools@noaa.gov.

The NOAA Milford Lab in Connecticut studies the environmental benefits—also called ecosystem services—that shellfish provide.

Nutrients like nitrogen are essential to life, but often excess nutrients end up in coastal waters from human sources including lawn fertilizer and agricultural runoff. When this goes unchecked, algae can grow out of control. This can cause environmental problems including low dissolved oxygen, fish kills, and dead zones. Oysters and other bivalves—shellfish with two shells— help keep nutrients in check by filter feeding on algae. While they feed, these mighty shellfish improve water quality. This effect has been well documented by scientists, although it is not typically considered within the aquaculture permit review process.

"We've heard from both regulators and industry members that they need a simple, intuitive way to calculate the environmental benefits shellfish aquaculture provides," said project lead Julie Rose. "We're excited to share our tool, which synthesizes data collected by excellent scientists from around the region to create a robust prediction of nitrogen removal that industry members and regulators can have confidence in."

Using the Aquaculture Nutrient Removal Calculator

To get an estimate of nitrogen removal, shellfish growers input the number of oysters they are harvesting and the average size of an oyster at harvest. The report that is generated also includes:

- Location of the farm
- Culture method (on-bottom, off-bottom, floating, or multiple methods)
- Ploidy (whether the oysters have two or three sets of chromosomes)
- Period of harvest

Importantly, the online tool produces information about the ecosystem services a farm provides. It also provides supporting citations that can be included in an U.S. Army Corps of Engineers public interest review or a state-level permitting process. "We hope this tool will provide growers and managers with an easy-to-use way to generate defensible values and context for the ecosystem services provided by a proposed or existing farm," explained Schillaci.

Results from the calculator may also help shellfish growers build awareness of the environmental benefits of shellfish farming within their local communities.

Danielle Blacklock, Director of NOAA's Office of Aquaculture, explained, "Partnership with Sea Grant is key to sharing the tool with the shellfish aquaculture industry to use and provide feedback. NOAA relies on this feedback to develop aquaculture calculators and decision-support tools nationwide."

Building the Tool

To create the tool, the team synthesized a large dataset from 10 states from Maine to North Carolina. It included oyster size measurements and nitrogen concentrations in shell and tissue for farmed oysters across the Northeast United States coast. Organizations that shared data to support the calculator include:

- University of Maine
- University of New Hampshire
- Cape Cod Cooperative Extension in Massachusetts
- Environmental Protection Agency in Narragansett, Rhode Island
- NOAA Milford Lab in Connecticut
- Stony Brook University in New York
- Rutgers University in New Jersey
- NOAA National Ocean Service in Oxford, Maryland
- Maryland Sea Grant
- NOAA Chesapeake Bay Office
- University of North Carolina Wilmington

Ryan Morse worked on the data management and app development aspects of the project. "The most time-consuming aspect was compiling and performing quality control for the data that form the basis of the calculator," said Morse. "Because the data came in many different formats, we needed to standardize it before merging it into one dataset. After that, the analysis was fairly straightforward."

The team adapted methods that the Chesapeake Bay Program uses for nutrient management to calculate the amount of nitrogen removed when farmed oysters are harvested. NOAA's Office of Aquaculture funded the project. Connecticut Sea Grant's Regional Aquaculture Liaison Zach Gordon hosted a virtual workshop about the calculator in November 2024 (recorded webinar).

Expanding the Calculator

The calculator was built to incorporate new data and information as they become available. The research team plans to add phosphorus removal to the calculator for a more comprehensive estimate of nutrient removal. They also are scoping data availability to expand the nutrient calculator into the Gulf of Mexico.

Essential fish habitat is another valuable ecosystem service that shellfish farms provide. The team plans to create a calculator to estimate the habitat benefits that shellfish farms provide using data from the GoPro Aquaculture Project, which has collected more than 1,600 hours of underwater video on shellfish farms and rock reef comparison habitats in Long Island Sound. The fish habitat calculator will also draw from data collected by partner projects. The team sees opportunities on the horizon to extend the tools beyond oysters to other commonly farmed bivalve shellfish, such as clams and mussels.

For more information, contact the Greater Atlantic Regional Fisheries Office at nmfs.gar.garfo@noaa.gov or Julie Rose at julie.rose@noaa.gov.

Source: https://www.fisheries.noaa.gov/feature-story/new-calculator-helps-oyster-growers-measure-water-quality-benefits-farms?utm_medium=email&utm_source=govdelivery

Recent Publications

Journal Articles

The list below provides a selection of research articles.

- Incorporating Habitat Use and Life History to Predict PCB Residues in Wild Fish in an Urban Estuary.
  Hoffman, J.C., T. Hollenhorst, G. Peterson, J. Launspach, E. Coffman, and L. Burkhard. 2024. Incorporating Habitat Use and Life History to Predict PCB Residues in Wild Fish in an Urban Estuary. *Marine Pollution Bulletin* 209:117271.

- Economic Losses to Inland Recreational Fisheries from Harmful Algal Blooms.
  Jayasekera, D.H., R.T. Melstrom, and K.L. Pope. 2024. Economic Losses to Inland Recreational Fisheries from Harmful Algal Blooms. *Journal of Environmental Management* 372:123238.

- Exploring Spatio-Temporal Changes in Coastal Recreational Fisheries and Potential Links to Extreme Weather Events.
  Ochwada-Doyle, F.A., N. Miles, J.M. Hughes, J.J. Murphy, M.B. Lowry, L. West, and M.D. Taylor. 2024. Exploring Spatio-Temporal Changes in Coastal Recreational Fisheries and Potential Links to Extreme Weather Events. *PLOS ONE* 19(6):e0305106.

- Characterizing the Areal Extent of PFAS Contamination in Fish Species Downgradient of AFFF Source Zones.
  Pickard, H.M., B.J. Ruyle, F. Haque, J.M. Logan, D.R. LeBlanc, S. Vojta, and E.M. Sunderland. 2024. Characterizing the Areal Extent of PFAS Contamination in Fish Species Downgradient of AFFF Source Zones. *Environmental Science & Technology* 58(43):19440-19453.

- Droplet Digital PCR for Precise Quantification of Human Norovirus in Shellfish Associated with Gastroenteritis Illness
  Rexin, D., L. Kaas, J. Langlet, D. Croucher, and J. Hewitt. 2024. Droplet Digital PCR for Precise Quantification of Human Norovirus in Shellfish Associated with Gastroenteritis Illness. *Journal of Food Protection* 87(11):100363.

- Development and Analyses of Stakeholder Driven Conceptual Models to Support the Implementation of Ecosystem-Based Fisheries Management in the U.S. Caribbean
  Seara, T., S.M. Williams, K. Acevedo, G. Garcia-Molliner, O. Tzadik, M. Duval, and J.J. Cruz-Motta. 2024. Development and Analyses of Stakeholder Driven Conceptual Models to Support the Implementation of Ecosystem-Based Fisheries Management in the U.S. Caribbean. *PLOS ONE* 19(5):e0304101.

- Incorporating Climate-Readiness into Fisheries Management Strategies.
  Talbot, E., J.-B.S. Jontila, B.J. Gonzales, R.G. Dolorosa, E.D. Jose, R. Sajorne, S. Sailley, S. Kay, and A.M. Queirós. 2024. Incorporating Climate-Readiness into Fisheries Management Strategies. *Science of the Total Environment* 918:170684.

- Predictions of Groundwater PFAS Occurrence at Drinking Water Supply Depths in the United States.
  Tokranov, A.K., K.M. Ransom, L.M. Bexfield, B.D. Lindsey, E. Watson, D.I. Dupuy, P.E. Stackelberg, M.S. Fram, S.A. Voss, and J.A. Kingsbury. 2024. Predictions of Groundwater PFAS Occurrence at Drinking Water Supply Depths in the United States. *Science* 386(6723):748-755.

- Shellcollect: A Framework for Smart Precision Shellfish Harvesting Using Data Collection Path Planning.
  Wang, C.-Y., A.G. Nandhan, Y.-T. Shen, W.-Y. Chen, S.S.S. Kumar, A. Long, A. Williams, G. Magnusson, A. Pattillo, and D. Webster. 2024. Shellcollect: A Framework for Smart Precision Shellfish Harvesting Using Data Collection Path Planning. *IEEE Access* 12:177829-177843.

- Chemical Mixtures of Mercury, PCBs, PFAS/PFOS, and Pesticides in Freshwater Fish in the U.S. and the Risks They Pose for Fish Consumption.
  Wu, P., C. Foley, W. Heiger-Bernays, and C. Chen. 2024. Chemical Mixtures of Mercury, PCBs, PFAS/PFOS, and Pesticides in Freshwater Fish in the U.S. and the Risks They Pose for Fish Consumption. *Environmental Research*:120381.

Upcoming Meetings and Conferences

National Environmental Justice Conference and Training Program
March 25–27, 2025
Washington, DC

Conference for Advancing Participatory Science
May 27–30, 2025
Portland, OR

Additional Information

This bimonthly newsletter highlights current information about fish and shellfish.

For more information about specific advisories within the state, territory, or tribe, contact the appropriate state agency listed on EPA's National Listing of Fish Advisories website at https://fishadvisoryonline.epa.gov/Contacts.aspx.

For more information about this newsletter, contact Sharon Frey (Frey.Sharon@epa.gov, 202-566-1480).

Additional information about advisories and fish and shellfish consumption can be found at https://www.epa.gov/fish-tech.