Accomplishments of the Alaska Region's Habitat Conservation Division in Fiscal Year 2017

Figure 1. The winner of July's Habitat Month Photo Contest – "How Habitat Helps." HCD's Linda Shaw won the 'Habitat Helps Critters' category with this photo of a starfish on eelgrass.

Habitat conservation, protection, and restoration are the foundation for sustaining the nation's fisheries. The Habitat Conservation Division (HCD) of the Alaska Region carries out the National Marine Fisheries Service's (NMFS) statutory responsibilities for habitat conservation in Alaska under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Fish and Wildlife Coordination Act, the National Environmental Policy Act (NEPA), the Federal Power Act (FPA), and other laws. To prioritize our resources and activities, make decisions in an ecosystem context, and strengthen the science behind our decision-making, HCD works closely with the Alaska Fisheries Science Center (AFSC), other NOAA line offices, the North Pacific Fishery Management Council (NPFMC/Council), other federal and state agencies, non-governmental organizations, local governments, and a variety of industry and conservation groups. By leveraging these partnerships we work together to better execute our mission and support healthy ecosystems, sustainable living marine resources, and resilient coastal communities.

This report highlights HCD's activities from October 1, 2016 through September 30, 2017. Over the course of Fiscal Year 2017 (FY17), HCD's work focused on the following main areas:

Essential Fish Habitat and Fishery Management

EFH Five Year Review

A Five Year Review Summary Report of Essential Fish Habitat (EFH) was finalized in June 2017.

ftp://ftp.library.noaa.gov/noaa_documents.lib/NMFS/TM_NMFS_AFKR/TM_NMFS_FAKR_15.pdf

This Review is required by a 2002 EFH Final Rule, and it revises and amends descriptions of EFH for Council-managed fisheries, evaluates fishing effects to EFH, and expands the discussion of adverse

effects of non-fishing activities on EFH. In April 2017, the Council recommended amendments to revise EFH descriptions and maps in fishery management plans (FMPs). Samantha Simpson led the development and publication of the Summary Report as an Alaska Region Technical Memorandum. .

EFH Descriptions/Omnibus Amendment to Update FMPs

The 2015 EFH Review recommends refining habitat descriptions and maps for most managed species using more recent information and new methods.

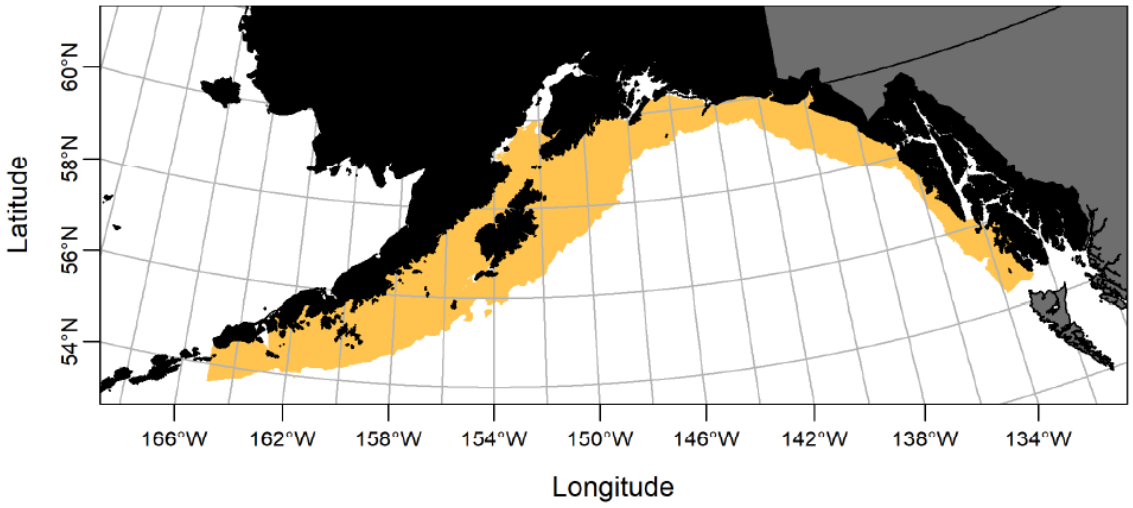

Figure 2. An example of a new EFH map - Gulf of Alaska juvenile Yelloweye rockfish summer EFH.

An EFH Omnibus Amendment was presented at the April 2017 NPFMC Meeting in Anchorage. This package reviewed EFH descriptions in all six of the Council's FMPs: Bering Sea/Aleutian Islands (BSAI) Groundfish, Gulf of Alaska (GOA) Groundfish, BSAI Crab, Scallop, Salmon, and Arctic, and made updates for BSAI crab and groundfish, GOA groundfish, Salmon, and the Arctic. Amendments represent the most recent findings from the EFH 5 Year Review. New models and information update EFH Text and Map Descriptions; evaluate fishing effects (FE); and discuss non-fishing (development) activities that may adversely affect EFH. The review evaluated new information on EFH, discussed fishing effects evaluated by stock authors in the newly developed model, assessed information gaps and research needs, and identified whether any revisions to EFH are needed or suggested. The analysis and cooperation was coordinated with the Alaska Fisheries Science Center, Council, academia (Alaska Pacific University), the fishing industry, and public stakeholders.

Impacts to Essential Fish Habitat (EFH) from Non-Fishing Activities in Alaska

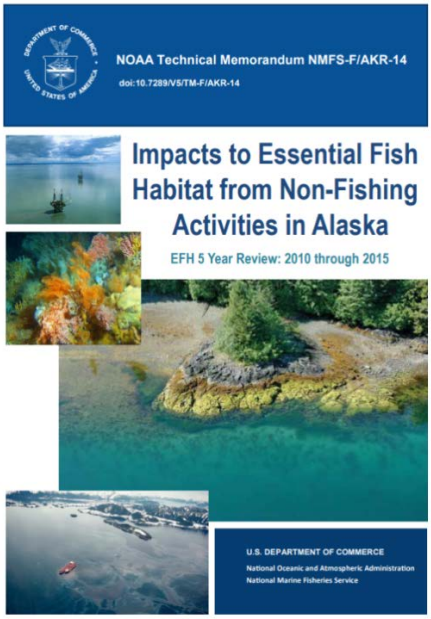

Figure 3. NOAA Technical Memorandum NMFS-F/AKR-14: Impacts to Essential Fish Habitat from Non-Fishing Activities in Alaska, part of the 2010-2015 EFH 5-Year Review

During the NPFMC December 2016 meeting, Matthew Eagleton and Doug Limpinsel presented the recent five-year review revisions, including a new technical memorandum, The Non-Fishing Impacts Report. ftp://ftp.library.noaa.gov/noaa_documents.lib/NMFS/TM_NMFS_AFKR/TM_NMFS_FAKR_14.pdf

The EFH Non-Fishing report discusses impacts on EFH from all human-induced actions besides fishing and recommends conservation measures by activity type, such as depositional fill, marine dredging, mining, road construction, and oil and gas developments. When federal action agencies determine their actions may adversely affect EFH, agencies must consult with NMFS to identify, discuss, and mitigate the action's effect to reduce impacts.

The new EFH Non-Fish Report discusses Alaska-specific ecosystems, ecosystem processes, and EFH attributes. An EFH attribute is water and any quality or characteristic given to, or supported by water, related biology, chemistry, or geology that benefits aquatic or marine species and trophic levels at several possible life history stages. New sections introduce ecosystem processes that support EFH attributes, including water filtration, temperature regulation, downstream distribution of dissolved organic material, secondary production, and trophic dynamics in nearshore fish nurseries. Each of the new introductions also cite the most recent sources of metrics of each biome and provides an ecosystem approach to the flow of water from terrestrial landforms to marine systems. The report also presents current observations of marine fisheries distribution and abundance in relation to changing ocean conditions. Lastly, new sections discuss increased vessel traffic through the Bering Strait and Arctic Ocean and the current state of oil spill response technologies and toxicology.

Fishing Effects Model

HCD Alaska Region and scientists at Alaska Pacific University developed a Fishing Effects (FE) model The FE model is based on interaction between habitat impact and recovery. Habitat impacts and recovery depend on the amount of fishing effort, type of gear, habitat sensitivity, and substrate. The FE considers

impacts of commercial fishing first at the population level, then uses objective criteria to determine whether additional analysis is warranted to evaluate if habitat impacts caused by fishing are adverse and more than minimal or not temporary.

The FE model updates the Long-term Effects Index (LEI) model used in the 2010 EFH review in the following ways:

- The FE model is cast in a discrete time framework. This means rates such as impact or recovery are defined over a specific time interval, compared to the LEI model which used continuous time. Using discrete time makes fishing impacts and habitat recovery more intuitive to interpret compared to continuous time. For example, an impact rate can be defined as 25% habitat disturbed per month.
- The FE model implements sub annual (monthly) tracking of fishing impacts and habitat disturbance. While this was theoretically possible in the LEI model, the LEI model was developed primarily to estimate long-term habitat disturbance given a constant rate of fishing and recovery. The FE model allows for queries of habitat disturbance for any month from the start of the model run (January 2003).This aids in the implications of variable fishing effort within season and among years.
- The FE model draws on the spatially explicit catch-in-areas (CIA) database (developed by Steve Lewis, NMFS) to use the best available spatial data of fishing vessel locations. In the CIA database, line segments represent individual tows or other fishing activities. In contrast, the LEI model used endpoint only representations. Thus, the use of the CIA database provides a more accurate depiction of fishing effort.
- After review of the FE model, a Coordinated Council Committee (CCC) determined no evidence that fishing activities are having more than minimal effects and thus consider them temporary. Therefore, new EFH Conservation Measures are needed to conserve EFH from adverse fishing practices and the FE model is considered a great resource.

EFH Research Plan (2017-2022)

The AFSC Habitat and Ecological Processes Research (HEPR) team and Regional EFH Coordinator reviewed eight EFH proposals as part of the FY 2017 Request for EFH Proposals. Proposals totaling $600,000 were ranked based on several factors, including scientific merit. The ARA for HCD, HEPR Lead, and Regional EFH Coordinator reviewed the rank proposals for alignment with management priorities and NOAA Fisheries leadership was briefed. When yearly funds become available, funding allocations can be transferred to line offices, as appropriate.

The Alaska EFH Research Plan was revised in 2017 to take advantage of EFH Review results and provides a basis for determining future research direction. The new plan adds flexibility to fund multi-year research (up to three years), promotes integrated studies, and updates research objectives for the next five years. The plan is now available online as an AFSC Processed Report: https://www.afsc.noaa.gov/Publications/ProcRpt/PR2017-05.pdf

In July 2017, NMFS announced the FY 18 EFH Request for Research Proposals. An over-arching purpose is to elevate EFH information for Alaska fish and crab species from Level 1 (distribution) and Level 2 (habitat-related densities) to Level 3 (habitat-related growth, reproductive, or survival rates). The anticipated overall amount for FY 18 is up to $300,000. Individual project amounts of up to $150,000 will

be considered. Alaska EFH Research Plan main contacts are Matthew Eagleton, HCD, and Mike Sigler, HEPR.

Habitat Modeling

New HCD staff member Dr. Jodi Pirtle has worked on projects to develop quantitative assessment methods and predictive habitat models for crabs and groundfish. Her most recent work focuses on developing models and maps to identify and describe habitat for groundfish species in the Gulf of Alaska for the Gulf of Alaska Integrated Ecosystem Research Program (https://www.nprb.org/gulf-of-alaska-project/about-the-project/) and the 2015 EFH Five Year Review. Jodi presented her work on groundfish habitat models at the AFSC Groundfish Seminar Series in November and was featured in a Habitat Staff Profile by NOAA Office of Habitat Conservation (http://www.habitat.noaa.gov/habitatmonth/staff/jodi_pirtle.html).

Jodi continues her habitat modeling work to refine EFH descriptions and extends these models through many collaborations with scientists from the NOAA Science Centers to inform stock assessment and ecosystem-based fisheries management through greater understanding of North Pacific marine ecosystems and recruitment dynamics for harvested stocks. Jodi produced the International Council for the Exploration of the Sea (ICES) Working Group on Marine Habitat Mapping 2017 US National Progress Report in July. She has also provided EFH consultation regarding seafood processing and aquaculture facilities.

Arctic EFH Descriptions

Jen Marsh, Alaska Sea Grant Fellow, presented on the use of species distribution models to describe EFH for arctic cod, saffron cod, and snow crab in the Arctic management region during the University of Alaska Fairbanks Fisheries Seminar in Juneau. Jodi Pirtle, Chris Rooper (AFSC), and Matthew Eagleton were co-authors and collaborators on the project. The presentation was video-conferenced to distance sites in Fairbanks, Homer, and Sitka. These new EFH Descriptions will likely be incorporated into the Arctic FMP during the next EFH Review. Jen has spent the year gathering data and developing the model as part of her Sea Grant fellowship which ended October 2017 - HCD will miss her dedicated work ethic to better Arctic resource information.

Environmental Review to Minimize Habitat Loss

HCD regularly reviews statewide projects and provides guidance for assessing potential impacts to EFH. More formally, under the MSA, federal agencies are required to consult with NMFS regarding any action they authorize, fund, or undertake that may adversely affect EFH, and NMFS must provide conservation recommendations to federal and state agencies regarding any action that would adversely affect EFH. HCD staff regularly meet with federal Action Agencies like the U.S. Army Corps of Engineers (USACE) to learn about upcoming and ongoing Corps' projects that may affect EFH. A subset of the many environmental review activities that HCD provided in FY16 is summarized below.

Fixing America's Surface Transportation Act (FAST)

The FAST Act was enacted by President Obama to increase the speed at which transportation projects move through the environmental permitting processes. The Office of Management and Budget and the Council on Environmental Quality require federal agencies to follow the FAST Act when reviewing certain projects. Currently, three large projects in Alaska are being tracked and reviewed:

1) Alaska LNG Project, Lead Agency – Federal Energy Regulatory Commission (FERC)
2) Kake to Petersburg Transmission Project, Lead Agency – FERC
3) Liberty Development Oil and Production, Lead Agency – Bureau of Ocean Energy Management (BOEM).

Doug Limpinsel, Samantha Simpson, and Matthew Eagleton track these projects with NOAA headquarters and communicate with other federal and state agencies on project details.

Oil and Gas Activities

Bureau of Ocean Energy Management (BOEM) Collaboration

HCD staff met with staff from BOEM in July to discuss their annual Environmental Studies Program, with particular regard to fish and EFH topics. In addition, staff discussed Arctic issues and are potentially following up on developing a programmatic EFH consultation with BOEM for resource development projects on Alaska's Outer Continental Shelf.

CAELUS Energy Alaska Proposed Oil Development

HCD Staff from Anchorage and Silver Spring along with other NMFS line offices' staff attended a meeting with CAELUS Energy Alaska. CAELUS invited Federal Agency staff to discuss exploration and development in the State waters of Smith Bay, Alaska. The agenda included a description of the large scale development, a rough time line, and the opportunity for federal agencies to ask questions. HCD staff requested information on how the project would affect EFH for Arctic cod and Pacific salmon. A formal development plan for the Smith Bay project is being developed and will be released in the summer of 2018 with a NEPA Record of Decision estimated for 2020. Development of the project will include offshore islands and over 100 wells in State waters.

Alaska Stand Alone Pipeline (ASAP)

This project would move liquid natural gas from the North Slope to Fairbanks and Cook Inlet to make natural gas available to communities throughout the state. Lydia Ames and Doug Limpinsel reviewed the Draft Supplemental Environmental Impact Statement and EFH Assessment for the project. They further composed NMFS EFH conservation recommendations as requested by USACE, including bridges and culverts that fully span braided streams, favoring open-bottom arch culverts, and post-construction evaluation of all mitigation measures.

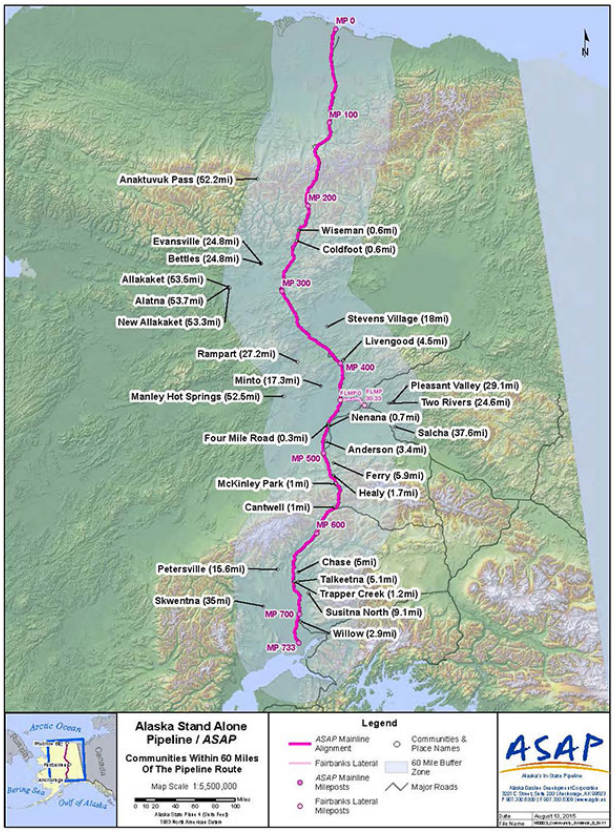

Figure 4. Map of Proposed Alaska Stand Alone Pipeline. The 733-mile low–pressure LNG pipeline would run from Prudhoe Bay to Point Mackenzie, with a 30-mile lateral line between the main pipeline and Fairbanks. Photo: Alaska Gasline Development Corporation (AGDC)

Spill Response Planning: Dispersants

HCD staff have participated in the development of dispersant avoidance areas within the Preauthorized Dispersants Use Area. Other State and Federal agency representatives and members of the public attended to guide the development of Dispersant Avoidance Areas as required by the Alaska Regional Response Team (ARRT) in the Dispersant Use Plan for Alaska. The Dispersant Use Plan for Alaska was signed in January 2016 and is part of the Alaska Federal/State Preparedness Plan for Response to Oil and Hazardous Substance Discharges/Releases, also known as "The Unified Plan." In the event of an offshore crude oil discharge, Avoidance Areas will guide the Federal On-Scene Coordinator (FOSC) in making dispersant use decisions.

Since 2016, Seanbob Kelly has been participating in the Dispersant Technical Working Group with representatives from the State of Alaska, US Fish & Wildlife Service, National Ocean Service and other NOAA line offices. The goal of this working group is to review agency and public comment regarding the establishment of dispersant avoidance areas within in the US Coast Guard's Dispersant Pre-approval area and present their recommendations.

Mining Activities

Donlin Gold Project EFH Coordination Meeting

Over a period of several years, HCD staff have met with representatives from the USACE Regulatory Division, Donlin Gold, and their consultants to discuss EFH coordination and receive project updates. In

the most recent meetings, Donlin representatives presented findings from several years of hydrology, fish, and habitat studies conducted within the project footprint and surrounding areas. Subsequently, the USACE and Project Proponents submitted an EFH Assessment to initiate the consultation process. Doug Limpinsel and Matthew Eagleton provided EFH conservation recommendations that if implemented correctly would assist in better predicting impacts and preventing degradation of ground and surface water regimes in areas outside the mining footprint area. EFH Recommendations focused on maintaining and improving adequate instream flows and water conditions, which would likely impact survival of salmon in early life stages under winter conditions. Adequate ground and surface water levels in the winter essentially support instream flows supporting migratory corridors in areas of the watershed not directly excavated or impacted by the project footprint.

Stream Restoration Post-Placer Mining in Interior Alaska

Sean Eagan participated in two inter-agency workshops to develop placer mine restoration standards for Interior Alaska. In the field, researchers determined the stream dimensions that will lead to a stable channel thereby promoting regrowth of riparian vegetation and improving fish habitat. These dimensions were measured on unmined streams in the interior within a similar precipitation zone. This effort is an acknowledgement that the effects of placer mining do not stay on the miners' claim, and they continue sending sediment and other contaminants downstream for decades after the mining is terminated.

Figure 5. Left: Sarah Venator (National Park Service) and Erica Lamb (Bureau of Land Management) survey a cross-section on Eldorado Creek in Denali National Park to determine natural bank full width, depth, and floodplain width. Right: Will Harman (Stream Mechanics) and Sean Eagan (HCD) finishing a survey of cascade-pool spacing Slate Creek. Pool-cascade spacing and step heights are how a mountain stream dissipates energy. By surveying a suite of natural stream reaches, federal agencies in Alaska hope to compile a guide to how placer miners should restore a stream once their mining is complete. Photos: Sean Eagan

Hydropower and Energy Projects

Grant Lake Hydroelectric Project

Sue Walker, Sean Eagan, and Homer Electric Association, Inc. reached agreement on FPA and MSA conservation recommendations for the proposed Grant Lake Hydroelectric Project. These recommendations included retaining a small amount of flowing water in the reach between Grant Lake and the fish barrier waterfall to maintain some streambed ecological functions, and the rest of the water

being returned a few hundred yards below the waterfall into salmon spawning and rearing habitat. These conservation recommendations were provided in a letter filed with FERC.

Hiilangaay (formerly Reynolds Creek)

HCD staff and Haida Energy Inc. (HEI) reached agreement on the design of a velocity barrier to exclude anadromous fish from the tailrace of this small licensed hydropower. After 16 years in limbo, this project is currently under construction and will provide clean hydropower for the town of Hydaburg.

Terror Lake Hydropower Meeting

HCD staff participated in the annual Terror Lake Instream flow meeting. For the last eight years, Kodiak Electric Association (KEA) has been experimenting with modified instream flow requirements that allow a deviation in the instantaneous 15-minute flow measurement as long as the 24-hour rolling flow average remains above the license mandated instream flow. In 2014, KEA began using an algorithm to project when the dam release valve aperture needed to be adjusted based on flow data from the USGS gauge and rainfall information. The pink salmon returns have been maintained under project operations (ADF&G data) and KEA has not had a violation of the 24-hour average flow (USGS data) in 2016. These combined actions allowed the utility to avoid burning half a million gallons of diesel with no additional negative impacts on fish.

Lower Eklutna Dam

HCD staff, with staff from the Alaska Department of Fish and Game (ADF&G) and HDR Consultants Inc., participated in a site visit on the lower dam of the Eklutna River. The dam was built in 1929. Currently, the dam is defunct due to siltation that has removed all water storage capacity and because the upper dam on the Eklutna Dam River has diverted all flows from the river since the 1950s. Eklutna Inc., a Native Village Corporation, and the Native Village of Eklutna have been working with The Conservation Fund to raise funds (approximately $7.5 million) to remove the lower dam and redistribute trapped sediments behind the dam into the lower river. The river is essentially dewatered by power and municipal water diversions from the upper Eklutna Dam; therefore, restoration of salmon habitat is not likely to result from removing the lower dam. It is possible that a future fish and wildlife mitigation plan for the upper dam (which is scheduled to begin no later than 2022) could restore both flows and fish to about seven miles of former salmon habitat. The purpose of this site visit was to assess the plans for mechanical and hydraulic redistribution of sediments currently trapped behind the dam and to develop ideas for monitoring channel morphology and fish habitat. In May, Sean Eagan worked closely with ADF&G, Eklutna Tribe, and HDR to survey in five cross-sections across the Eklutna River below the old dam and two above it. These cross-sections will help NMFS understand how the sediment behind the dam moves once the dam is removed and how it will affect salmon spawning and rearing habitat.

U.S. Society of Dams Conference

Sue Walker gave a presentation in September about using climate science to predict the long-term effects of changing climate and hydropower on salmon in northern rivers. This hydropower industry conference addressed the design, permitting, environmental, and sustainability challenges of dams in cold climates. Sue's presentation was based on many years of work addressing use of climate science in hydropower planning in Alaska and nationwide. She has collaborated with climate scientists from University of Alaska Fairbanks' Alaska Center for Climate Assessment & Policy and with Andrea Ray and Joe Barsugli from NOAA's Earth System Research Laboratory (ESRL) in Boulder. NMFS needs climate studies in order to understand potential effects of hydro projects on resources NMFS is responsible for

under the FPA and to adequately prepare and develop hydropower license terms and conditions that protect those resources.

NOAA 15th Annual Climate Prediction Applications Science Workshop

Sue Walker gave an invited oral presentation entitled “Creating Actionable Science for Hydropower Licensing Decision Making,” at NOAA’s Annual Climate Prediction Applications Science Workshop. Sue worked with climate scientists Andrea Ray and Joseph Barsugli, the Greater Atlantic Region Hydropower Coordinator Sean McDermott, and West Coast Region Fish Biologist John Wooster.

This presentation described a multi-year interdisciplinary, cross-line office effort by climate and fishery scientists to develop climate study requests that address FERC’s concerns about uncertainty of climate projections. Projects include the proposed Susitna-Watana dam in Alaska, relicensing of the LaGrange Project on the California’s Tuolumne River, and the Hiram Project on Maine’s Saco River. This presentation discussed the role that uncertainty in projections of climate change has played in developing acceptable climate study requests, and NMFS’ need for this information in its own decision making process.

FERC’s Integrated Licensing Process for licensing non-federal hydropower projects can bridge the gap between science and decision-making by requiring analysis to assess the impacts of changing climate on these projects and affected NMFS trust resources. Climate information is essential for planning such long-lived, water dependent-projects and for the resources affected by the altered hydrology. NMFS must use the best available science to understand the combined effects of hydropower projects and climate changes and continue to protect and manage fish and fish habitat throughout the life of the dam and beyond. Us of climate risks in planning is recommended by NOAA and Council on Environmental Quality (CEQ) guidance and required by Federal Executive Order #13693, but FERC is not subject to that order.

Final Hydropower publication on planning for climate change

A final publication, "Planning for Climate Change Impacts on Hydropower in the Far North" was published on January 9 in the European Geosciences Union Journal of Hydrology and Earth System Sciences. It will be used as a template for addressing climate change predictions, estimating uncertainty and as a source of best practices for integrating science into management and decision-making. This research was funded through NMFS National Hydropower Program's Science and technology program and researched and written by Jessica Cherry from UAF, Sarah Trainor and Corrie Knapp from NOAA Regional Integrated Sciences and Assessments (RISA), Andrea Ray from NOAA ESRL, and Susan Walker from HCD. To view document: http://www.hydrol-earth-syst-sci.net/21/133/2017/

Transportation

Meeting with Department of Transportation

HCD staff met with members of the State of Alaska’s Department of Transportation (DOT) in November to discuss EFH consultations. Among the many agenda items was an opportunity for HCD staff to present DOT staff with information about EFH and the consultation process. Existing and new HCD staff met their counterparts at the DOT to encourage strong interagency working relationships. A long question and answer portion of the meeting resulted in several follow-up items including recommended updates to the DOT website, and revisions to documents describing HCD and DOT responsibilities during consultations. HCD staff also introduced the EFH online mapper and provided information on the 2015 EFH 5-year review. A follow up meeting is planned for the coming months.

Juneau International Airport

Sean Eagan and Cindy Hartmann Moore attended an agency pre-application meeting on the Juneau International Airport Planning and Environmental Permitting for a Taxiway - A Rehabilitation and Runway Incursion Mitigation. The purpose of the meeting was to give an overview of the project, answer agency questions, and get agency comments and information needs for the permitting process. HCD staff provided the project planners with HCD's information needs for assessing potential impacts to fish resources and water quality.

Haines Highway

In April, Cindy Hartmann Moore participated in an inter-agency meeting on the Haines Highway Improvement Project. Discussion focused on review of the proposed fish passage culverts and design recommendations as well as review of the proposed mitigation. Mitigation for this project includes creation of new stream channels, installation of in-stream fish habitat structures, installation of a fish passage culvert near Mud Bay, and payment of compensatory mitigation to an in-lieu fee provider or to a mitigation bank. Recommendations were made for changes in the design proposed for the in-stream log clusters. The Alaska Department of Transportation accepted the recommendations made by the agencies.

In September, Cindy participated in an interdisciplinary team meeting to review mitigation sites for the project. NMFS and other federal agencies recommended compensatory mitigation for impacts to wetlands and streams. The team focused on sites in the second construction phase of the project from milepost 12 to milepost 23. NMFS will be a member of the adaptive management team required as a condition of the project permit for this action.

Glacier Highway Improvement Project

In April, Sean Eagan and Susan Walker commented on the Alaska Department of Transportation's Glacier Highway Improvement Project in the Lemon Creek area. The road currently crosses four anadromous fish streams. The plan includes adding a bike lane and a roundabout, resurfacing the road, and sliplining most of the existing culverts. NMFS requested that a hydraulic analysis of the sliplined culverts' ability to pass fish be conducted before the plan is finalized, and that the culvert bottoms be corrugated to retain gravel. Through input from the U.S. Fish and Wildlife Service (FWS) and NMFS, parking lot runoff water from the Anka industrial area will now be allowed more opportunity to infiltrate into the soil prior to entering Vanderbilt Creek.

Other Projects

Dredging

Seanbob Kelly attended the Western Dredging Association (WEDA) Summit and Expo in Vancouver, BC. The purpose of the meeting was to promote the exchange of knowledge in fields related to dredging, navigation, marine engineering, and construction by providing a forum for the improvement of communication, technology transfer, and cooperation among industry and regulators. During this meeting, there were ample opportunities to understand the importance of cooperative solutions for problems related to the protection and enhancement of the marine environment as well as recent research into the effects of dredging on fish habitat. Seanbob later gave a presentation on marine dredging to AKR staff, offering insight and summarizing findings from the WEDA conference. The presentation included equipment information, science of habitat impacts of dredging, and a case study of the recent Douglas Harbor dredging project.

Zimovia Strait

Cindy Hartmann Moore made a site visit with FWS staff in October to assess habitat at the proposed location of a project in Wrangell, Alaska. The proposed project is a 580' long causeway/ breakwater, dredged boat basin and entrance channel (with a gangway and floats), a boat/seaplane ramp, and fill for a pad adjacent to the ramp for vessel/aircraft maintenance and winter storage. This project would fill or change the habitat characteristics of over 2 acres of intertidal habitat. HCD originally provided comments to the Corps in May 2016 with a recommendation that the project not be authorized as proposed. Staff discussed the proposed project with the applicant and some of the information gained from the site visit was relayed to the USACE.

HCD and Corps staff met in November to discuss resource concerns, resolve issues on alternatives, and examine options for appropriate compensatory mitigation for the proposed project. The Corps agreed to go back to the applicant to discuss the project and explore additional opportunities to avoid and minimize adverse effects. In addition, the Corps will go through the Statewide Interagency Review Team and alert in-lieu fee fund banks of the potential opportunity for on the ground restoration.

Seafood Processing

In January, Jodi Pirtle provided EFH consultation to the Alaska Department of Environmental Conservation Division of Water regarding issuance of an Alaska Pollutant Discharge Elimination System statewide general permit for Onshore Seafood Processors.

Sitka Boat Ramp

Sean Eagan commented on an USACE permit to construct a large boat ramp near Sitka. The location was constricted by land ownership issues and the applicant proposed to fill approximately 0.15 acres of eelgrass habitat. NMFS proposed two conservation recommendations to avoid the majority of the eelgrass habitat and both recommendations were included in the final USACE permit.

Kodiak Island EFH Site Visits

Matthew Eagleton and Seanbob Kelly conducted site visits in Kodiak in April. EFH consultations have previously been conducted for channel modifications near the Pasagshak River Day Use Area (coastal coho habitat) and the Buskin River freshwater/marine tidal-interface area as part of the Kodiak Airport runway extension project. Site visits serve an important role in HCD's mission to conserve and enhance habitats necessary for the various life histories of federally managed species.

Kivalina Evacuation Route

Samantha Simpson and Sean Eagan visited Kivalina in August to evaluate the effects of constructing an evacuation causeway and bridge across the Kivalina lagoon. Three hundred Kivalina residences live on a barrier spit that is 3,200 feet from the mainland with no means to evacuate during severe storms. These Inupiat people also rely on fish caught in the lagoon for food and discussions with local fishermen confirmed that several species of salmon are present both in the lagoon and in the Wulik and Kivalina Rivers. The proposed causeway/bridge alignment would not block either salmon run and potentially would have minimal effect on the salmon runs. HCD will continue to engage with Alaska Department of Transportation and the Project Team to ensure that the bridge/causeway will maintain sediment transport and water circulation conditions, ensuring continued fish passage through the lagoon.

Figure 6. Left: The narrow Kivalina spit is vulnerable to huge waves generated by storms from the Chucki Sea. The town's proposed evacuation route must cross this 3,200 foot wide lagoon and this proposed crossing has the potential to affect EFH and is why Alaska Department of Transportation is consulting with NMFS. Photo: ShoreZone. Right: HCD's Samantha Simpson and Sean Eagan on a site visit to Kivalina to evaluate the route for the evacuation causeway. Photo: Sean Eagan

Consultation Tracking

HCD staff participated in a webinar demonstration of a web-based ESA and EFH consultation tracking system mock-up in October. The demo shared what a potential replacement for the current Public Consultation Tracking System (PCTS) could look like. This demo kicked off the process of getting regional input into a replacement for PCTS. Cindy Hartmann Moore continues to participate in a working group that will help guide development of a new and revised system.

National and Alaska Fish Habitat Partnerships

Southeast Alaska Fish Habitat Partnership (SEAKFHP)

SEAKHP is a partnership of federal, state, and private organizations that works to foster cooperative fish habitat conservation in freshwater, estuarine and marine ecosystems across the southern panhandle of Alaska including the dynamic watersheds and waterways that makeup the Alexander Archipelago.

Cindy Hartmann Moore and Sean Eagan helped write SEAKFHP Strategic Plan for 2018-2022. For the first time the plan now includes four specific objectives dedicated to nearshore and estuarine habitats. Erika Ammann of the Restoration Center successfully lobbied for funds to help support the writing of this plan.

SEAKFHP has six meetings per year which both allowed us time to work on the Strategic Plan and also serve as platforms where many different organizational representatives make presentations on various studies, surveys, and tools related to the conservation of southeast Alaska. Highlights from various SEAKFHP partners include:

- United Fishermen of Alaska (UFA)'s presented the results of Salmon Habitat Information Program survey of UFA members regarding salmon habitat
- Overview of Audubon Alaska's Ecological Atlas for Southeast Alaska. http://ak.audubon.org/press-release/salmon-seabirds-new-ecological-atlas-southeast-alaska
- USFS's 2016 Watershed Condition Assessment which developed the USFS Priority Watershed Areas Land type Associations for the Tongass NF, and is also a landscape assessment tool

- Southeast Alaska Conservation Council (SEACC) /Alaska Department of Environmental Conservation (ADEC) explained their Water Quality Data Sharing Project
- SEABANK is a new hub of scientific and economic information and a marketplace for the region's sustainable products, with the overall goal of increasing awareness to the value of southeast Alaska estuaries
- The Nature Conservancy presented their estuary classification work for SE Alaska.
- NOAA's Restoration Center staff explained how their grant funds could potentially be used to fund fish passage barrier removal/remediation, stream habitat improvements/restoration, and coastal and community resiliency projects in SE Alaska.

Other Noteworthy Activities

Mitigation Policy

A presidential memorandum from November 3, 2015 – "Mitigating Impacts on Natural Resources form Development and Encouraging Related Private Investment" - directs federal agencies to adopt a common set of best practices to minimize the harmful impacts to ecological resources, and to ensure that any remaining harmful effects are appropriately addressed or mitigated. Linda Shaw and Samantha Simpson have participated in many conference calls and one workshop with the goal of developing a mitigation policy for NMFS.

Several calls were held in late 2016 and early 2017, with the goals of developing mitigation definitions and specific regulatory requirements, fostering a shared understanding of program authority, and compiling this information to develop broad "mitigation policy statements." The topics that these statements cover include the role of preservation, invasive species, high value resources, incorporation of climate change, studies as compensation, and assessment tools.

At a February 2017 workshop with nationwide NOAA Fisheries staff at the NOAA ESRL in Boulder, Colorado, a timeline and steps were developed for the first draft of the NOAA Mitigation Policy. An initial draft policy was developed in April 2017. The draft Mitigation Policy has gone through several revisions since April, with the goal of a final version at the end of 2017 that accounts for Alaska perspectives on a number of issues. In pursuing meetings, habitat evaluation was extensively discussed and Linda and Sam contributed valuable input. AKR staff recommended clarifying evaluation language to ensure that scarcity may be considered but is not required for high value habitat. This recommendation was made to ensure that abundant yet high value habitats in Alaska are potentially included.

Tongass Collaborative Stewardship Group (TCSG)

The TCSG is a broad spectrum of partners and agency personnel interested in management of the Tongass National Forest. Their purpose is to enhance ecological, social, and economic well-being in Southeast Alaska by supporting collaboration among practitioners of land management and resource stewardship.

Cindy Hartmann Moore participated in annual and quarterly meetings of the TCSG this year. These meetings included:

- project highlights from 2016 collaborative stewardship projects
- collaborative landscape-scale land management projects for the future
- discussions of the revised Tongass Land Management Plan and emerging opportunities
- discussions of forest-based workforce development opportunities

- work with the Tongass Transition Collaborative
- US Forest Service priorities for 2018-2020
- A review for Tongass National Forest biologists on EFH assessments and consultations
- Retained receipts, which fund a wide variety of forest stewardship projects including fisheries enhancement projects and fish passage projects. HCD staff will participate in the review of projects in the retained receipts proposal process.
- HCD's pledge to try and facilitate the readiness of TCSG partners to apply for NOAA grant funds that could help restore fish passage at current migration barriers as well as provide funds for habitat restoration and community resilience.

Fisheries Ecosystem Plan (FEP)

Seanbob Kelly attended a joint meeting of the North Pacific Council's Bering Sea Fishery Ecosystem Plan (BS FEP) team and the Aleutian and Bering Sea Islands Landscape Conservation Cooperative (ABSI) in Homer, Alaska to discuss collaboration. Both groups represent Federal agencies like NOAA, FWS, National Park Service (NPS) and State and the NGO community. The goal of this joint meeting was to identify mutual interests that could apply to the development of the FEP. The ABSI steering committee shared information on the coordination, dissemination, and development of applied science to inform conservation of natural and cultural resources in the face of climate change and other landscape-scale stressors in the region. The BS FEP is intended to be used to guide policy options and associated opportunities, risks, and tradeoffs affecting FMP species and the broader Bering Sea ecosystem in a systematic manner. The objectives of the BS FEP are:

- Document current procedures and best practices for ecosystem-based fishery management (EBFM)
- Provide brief, targeted, and evolving descriptions of the interconnected physical, biological, and human/institutional factors that affect the Bering Sea ecosystem
- Direct how all this information can be used to guide fishery management options

ShoreZone

ShoreZone is a database of coastal data, imagery, and maps that improves our ability to understand and manage the diverse and dynamic coastal changes and development of the Pacific Northwest and Alaska coastlines. Dozens of partners help to make millions of photos, video, maps, and digital habitat data available online to the public for free. HCD staff continue to work on the Alaska Region's Five-Year ShoreZone plan and participate in annual partner meetings and Steering Committee Meetings. They continue to update NOAA leadership on topics such as ShoreZone protocol updates, development of an offline viewer, member activities, and coordinator funding. HCD staff also continues to work to draft Terms of Reference to guide the Steering Committee and future ShoreZone partner collaborations.

HCD staff, Sustainable Fisheries staff, and Auke Bay Laboratories staff have participated in several teleconferences with the ShoreZone contractor to review and discuss changes to the ShoreZone protocol proposed in FY16. The revision will incorporate the recent improvements including coastal vulnerability, percent cover of biobands, and other improvements. The intent is to continue to improve the mapping of habitat features while maintaining the backwards compatibility of the extensive database. A schedule was set for review of the draft by NMFS and other key Alaska partners followed by review by partners outside Alaska. The end product will encompass the complete mapping protocol for the Pacific NW from the North Slope through Oregon.

Figure 7. Map of the extent of ShoreZone coastal mapping and imagery as of the end of FY17.

At the Oceans 17 Conference, Cindy Hartmann Moore along with Nicole Kinsman of National Geodetic Survey and Sue Saupe of Cook Inlet Citizens Regional Advisory Council presented a 4-hour workshop titled: *ShoreZone: An inventory and photographic record of coastal habitats in Alaska and the Pacific Northwest.*

Cindy Hartmann Moore used year-end funding to contract several tasks: ShoreZone mapping of the Barren Islands, ShoreZone imaging in Glacier Bay, development of a Human Impressions booklet, and development of an on-line Illustrated Data Dictionary. Steve Lewis (SF), Mandy Lindeberg (AFSC, ABL), Amy Holman (NOAA Collaboration team), Kristie Balovich (OMD), Dana Whiteley (OMD), Gilbert Mendosa (OMD), and Crystina Jubie (WASC) were all instrumental in getting these tasks contracted. These actions will increase the amount of coastline mapped, make information on ShoreZone more accessible, and highlight the human use aspect of Alaska's coastline. Currently approximately 93 percent of Alaska's coastline has ShoreZone imagery and corresponding physical and biological mapping data. All this imagery and data is available online for anyone to access.

Invasive Species

The Arctic Invasive Alien Species (ARIAS) Strategy and Action Plan was recently finalized by the Arctic Council on May 11, 2017 at their Ministerial Meeting in Fairbanks. HCD provided an overview of the plan, its relevance to fisheries, and steps forward at the June 2017 NPFMC meeting in Juneau. Pribilof Island monitoring was given as one project NOAA Alaska Region hopes to implement to support the

priority actions of the Plan. Updates at the June meeting were given on U.S. Implementation of the strategy and action plan through the Conservation of Arctic Flora and Fauna (CAFF) U.S. chairmanship to ensue for the next two years. HCD's Linda Shaw and NOAA International's Eleanor Bors advocated for NOAA interests in this process and asked for representation on two subcommittees to address science, technology and policy.

As the domestic implementation team for ARIAS, HCD staff continue to participate in the US Arctic Invasive Species Working Group (USAISWG) along with Arctic Program staff. The group is working toward greater formalization of inter-agency and partner efforts to advance a strategic approach to Arctic invasive species management. Toward that goal, the National Invasive Species Council (NISC) will be developing a draft formalized structure for eventual agency endorsement to allow greater coordination and focus on this issue. In the December meeting of USAISWG, an update of the new Executive Order #13751 on invasive species was given, emphasizing three areas:

- the linkages between invasives and climate change
- raising the profile of invasive linkages to human health
- advancing science and technology innovation in addressing invasive species prevention and management.

Figure 8. The invasive tunicate Didemnum vexillum is a known problem in southeast Alaska. Photo: NOAA

In more recent developments of the USAISWG, Linda Shaw, Aaron Martin (FWS), and Tammy Davis (ADF&G) are developing the US strategy to combat invasive species in the Arctic. This will involve bringing together experts on marine, freshwater and terrestrial invasive species to determine what is being done, what gaps exist and what actions should be taken to reduce threats to the Arctic. The scope of this effort is Alaska-wide and is intended to address both capacity and management issues.

A number of experts and authorities are advocating for increased monitoring in Arctic port communities in Alaska. At the Alaska Invasive Species Conference in October, Dr. Chris Ware of the Committee for Noxious and Invasive Pest Management (CNIPM) recommended management of invasive species through ports as a good strategy to prevent and respond to marine invasive species in the Arctic. Tammy Davis has expressed interest in expanding the CNIPM strategic plan to include the Arctic and has asked NMFS to contribute to this effort. The Bering Sea Marine Invasive Species Risk Assessment and Ranking

is a UAA project that was submitted to the North Pacific Research Board for funding through their grant process. HCD staff have collaborated with UAA by providing review of a number of species draft rankings and assessments to the Research Board. Participation from the community on this issue is key; HCD staff have asked the NPFMC for engagement of the commercial fishing industry and continue to explore opportunities for community outreach about marine invasive species. Notably, HCD staff are partnering with the Smithsonian Environmental Research Center, NOAA International and the Aleut Community of St. Paul Island to introduce marine invasive species community monitoring via the Plat Watch Project through the education Bering Sea Days, planned for October 2017. The event will establish a new Arctic gateway marine monitoring station and provide educational instruction on invasive species.

Figure 9.The European green crab is a voracious invasive species in the Pacific Northwest, but is not known to occur in Alaska. The hardworking staff of HCD intend to keep it that way. Photo: NOAA

Linda Shaw continues to participate in the West Coast Region's Cross-Divisional Invasive Species Team. Chris Yates (PRD California) is the new Leadership Sponsor for the Team. The Team has welcomed Alaska participation and the Alaska Region benefits by being kept up to date on happenings in the West Coast Region where sources of infestations to Alaska may originate. The Team is going to develop a list of priorities for the West Coast Region based on the species of greatest concern that may affect NMFS species with recovery plans using the recent tasker to HQ that Alaska contributed to.

Outreach, Conferences, and Presentations

Habitat conservation is the foundation for sustainable fisheries. HCD shares information about our efforts through a variety of venues. These include professional meetings, conferences, and presentations to the public. A short list of outreach events HCD participated in during FY17 is provided below:

- North Pacific Fisheries Management Council Meetings
- Centennial Science and Stewardship Symposium
- Mat-Su Salmon Science and Conservation Symposium
- Interagency Hydrology Committee for Alaska
- AFSC Groundfish Seminar Series
- Restore America's Estuaries & The Coastal Society Meeting: Our Coasts, Our Future, Our Choice

- Alaska Marine Science Symposium
- The Conservation Fund (TCF) Interagency Team (IRT) Meeting
- Gulf of Alaska Integrated Ecosystem Research Program Synthesis Workshop
- American Fisheries Society Meeting
- Pacific Ballast Water Group Annual Meeting
- Western Regional Panel Coastal Committee Meeting
- US Army Corps of Engineers Project Meeting
- Kodiak Area Marine Science Symposium
- Coastal Cutthroat Trout Workshop
- Western Alaska Interdisciplinary Science Conference and Forum
- Climate Prediction Applications Science Workshop
- Lowell Wakefield Fisheries Symposium on Impacts of a Changing Environment on the Dynamics of High-Latitude Fish and Fisheries
- Water Quality Monitoring Workshop Linking the Science and People of Our Transboundary Rivers
- International Council for the Exploration of the Sea (ICES) Working Group on Marine Habitat Mapping
- Sablefish Summit at AFSC Ted Stevens Marine Research Institute

Final Word

NMFS's long-term goal of Healthy Oceans - marine fisheries, habitats and biodiversity sustained with healthy and productive ecosystems - begins with healthy habitats. The work that the HCD engages in; to conserve, protect and restore living marine resources, through consultations and other activities, is critical in providing for resilient coastal communities and ecosystems. Healthy habitat is necessary for sustainable fisheries, protected resources, and in almost every other NOAA and NMFS program. Simply put the work that HCD does provides the foundation for the "house that NOAA built." In 1996 Congress strengthened that foundation by amending the Magnuson-Stevens Act to include EFH provisions. Congress stated in the Act, "One of the greatest long-term threats to the viability of commercial and recreational fisheries is the continuing loss of marine, estuarine, and other aquatic habitats."

All living marine resources are vulnerable to habitat degradation, which can threaten the biodiversity on which they depend. These habitats are at risk from human activities which degrade or destroy habitat quality and quantity. HCD's efforts to conserve habitat are as diverse as the resources NMFS manages. These efforts are both reactive and proactive in nature and staff involvement in these activities includes: identification and conservation of EFH through fishery management activities; environmental reviews of non-fishing activities to avoid, minimize, or offset the adverse effects of human activities on EFH and living marine resources in Alaska; and participation in partnerships and the NOAA Habitat Blueprint.

Come visit us at: https://alaskafisheries.noaa.gov/habitat