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Rightsizing the NOAA Fisheries Northwest Fisheries Science Center:

Project Report

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Contents

Figures

Tables

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Executive Summary

The Northwest Fisheries Science Center (NWFSC) Rightsizing Project, which ran from June 2020 to March 2021, aimed to better position NWFSC to meet its changing scientific priorities, increasing costs that outpace its budget, and its evolving workforce. The Center will need to continue to adjust its staff levels, management structure, and scientific role as the budget changes from year to year and in response to major policy initiatives such as climate change research or events such as oil spills or the listing of endangered species.

The primary goal of the Rightsizing Project was to assess how NWFSC could adjust its labor force and management approach to dynamically adapt its roles to changing scientific needs and budget resources. Project leaders Alan Haynie (NMFS/AFSC) and Seema Balwani (NESDIS/Pacific Islands Region), both on detail at NWFSC, conducted interviews with NWFSC, the West Coast Region (WCR), and broader NMFS staff to understand the Center's budget process and scientific priorities.

Emergent Focus Areas

One focus of the Rightsizing Project was to examine changing budget and staff levels, primarily since 2008. Several central findings arose from our budget analysis:

- Like all of the NMFS science centers, the NWFSC budget has been relatively flat for approximately a decade. At the same time, labor costs have increased steadily, with its per employee cost increasing by approximately one-third while the number of federal employees declined from 401 to 264 between 2008 and 2020.
- Automatic cuts in federal spending, including at NMFS, were imposed through budget sequestration in 2013, which led to a dramatic reduction in the NWFSC labor force, primarily through a reduction in federal "term" employees. In contrast, over the longer term, events in the 1990s—such as major oil spills and salmon Endangered Species Act listings—led directly to staff and budget growth.
- NWFSC needs to work to increase its share of discretionary funds—those not linked to a specific program, project, or activity (PPA)—so that it can effectively address emergent budget needs. Continuing to centralize budget tracking is an essential element of this process.

As well as examining the budget, we provided considerable work in five "emergent focus areas." We identified the focus areas as the concrete topics where we felt that our attention could be the most effective:

1. **Reimbursable Funding**. We developed the NWFSC Reimbursable Funding Strategy. NWFSC has a unique reliance on reimbursable funds, ranging from 22–32% of the Center budget since 2011.

   Key Recommendation: Adopt the Reimbursable Funding Strategy. Communicate with staff that new reimbursable work should be mission-focused and that staff should discuss with leadership whether lower-priority work should be continued.

2. **Transitioning Employees to New Roles**. A change in research focus for NWFSC often requires that employees shift their research focus to new areas. This can be very challenging for employees and managers. We discuss best practices of how to do this, drawing from past successes and failures at the Center and elsewhere. Detailed steps for transitioning employees are described.

Key Recommendation: The Center should be proactive and invite employees to imagine how they could effectively move to higher-priority research areas. When an employee has to move, a clear transition process and plan, as well as commitment from leadership, are essential to success.

3. **Salmon Research** is a major part of what the Center does; it makes up much of the research of three of NWFSC's science divisions, and will continue to do so. The Center's diverse work provides incredible value to the nation, but could be more efficiently focused on NMFS priorities and the unique capacities of the Center.

Key Recommendation: More effort is needed to prioritize salmon research at the Center and its relationship to work occurring throughout the Pacific Region. The new Protected Resources/Salmon Strategic Planning Team will be a great step toward promoting this interest, but it is important that division directors and other Center leaders have the time to communicate with stakeholders and other researchers to enable the Center to most effectively focus its efforts.

4. **Planning and Budget Process Integration**. As the creation of the Rightsizing Project indicates, NWFSC recognizes that adapting to changing budget commitments and science priorities will continue to be a challenge, and has implemented a variety of steps to attempt to match financial resources with existing scientific strengths and changing scientific priorities. Over the last few years, several new and significant processes have been implemented. Key among these are the annual project prioritization (APP) process, which addresses the scientific priorities of diverse NOAA and NMFS strategic plans; the increasing use of the Annual Guidance Memo (AGM; Werner 2020); and the changing administrative structure of the Center.

Key Recommendation: Continue to regularly communicate with staff through diverse means. Request formal and informal feedback, and utilize the AGM as NWFSC leadership's presentation of how various goals and key changes are connected.

5. **Climate Change Research**. Climate change is a major focus of the Biden Administration and will have cross-cutting impacts on most of the Center's research. Climate change research will continue to expand, and more attention will be needed to effectively coordinate this work.

Key Recommendation: Create an NWFSC climate change research team to identify the core climate-related research needs for the Center, and the short- and long-term costs of these activities. NWFSC, with input from WCR, should update the NMFS Western Regional Action Plan (NWFSC and SWFSC 2016) with focused actions that target long-term scientific priorities and, where possible, immediate actions to address the impacts of climate change.

Conclusions and Next Steps

The NWFSC Rightsizing Project examined NWFSC's labor and programmatic changes in response to evolving scientific needs and budget commitments. Other science centers face similar challenges. NWFSC should continue its efforts to be more dynamic, through training staff, discussing and communicating science priorities, and focusing on how the Center, as a federal government laboratory committed to the broad interests of the nation, can be of the greatest value. The dynamic environment in which the Center functions requires an equally dynamic approach to Center management, staff development, and stakeholder engagement.

1. Introduction to the Rightsizing Project

NOAA Fisheries science centers have a broad mission that has evolved over time. All science centers have the challenges of a) maintaining efficient operations that meet mandates, and b) supporting effective resource management in light of dramatically changing budgetary resources and demands.

The goals of this project were to help examine the changes that have occurred at the Northwest Fisheries Science Center (NWFSC; Seattle, Washington) over recent decades, to make NWFSC more prepared for long-term change, to assess the appropriate scale of the science center enterprise, and to identify what tools will best improve its operation.

The project primarily focused on NWFSC, but also examined some budgets and future priorities of all of the NOAA Fisheries science centers to provide greater context for NWFSC and to provide insights, where possible, to the other science centers. As discussed in further detail in this report, business-as-usual is not a viable strategy. Long-term budgets for science centers are nominally level and decreasing in inflation-adjusted terms, while centers have an ever-greater budget share devoted to the labor costs of a maturing workforce as well as increased operational costs. While the need to respond to these budgetary challenges is a major driver for this project, there are also new opportunities for efficiency and greater value to stakeholders through utilizing changing technology, developing new partnerships, and expanding interdisciplinary science that can improve the work the science centers do. All of these changes at NMFS science centers occur in a larger context, with evolving roles of the centers related to the NMFS regional offices, regional fishery management councils, other NOAA line offices, universities, industry, environmental organizations, and other partners.

This investigation was guided by a series of questions:

1. Is there a "right size" for NWFSC and the other science centers? Should this size be relatively stable across time? If so, how can it be flexible with variable demands—such as major oil spills or Endangered Species Act of 1973 (ESA) listings—and new challenges, such as climate change?
2. What are the core functions of a science center that have to be performed at all budget levels?
3. Does the size of a division impact its functioning, employee satisfaction, or other observable factors?
4. What have been previous drivers for science center expansion, contraction, and budgetary variation?
5. What tools and information are most valuable for helping center leaders make good strategic decisions for long-term success? What additional tools would be helpful?

1.1 What Does It Mean to Rightsize NWFSC?

"Rightsizing" is a term that emerged in the 1980s. It is sometimes interpreted as being synonymous with downsizing, but usages note that rightsizing is about making an organization the right size to achieve its objectives. There is not one right size for NWFSC, but a variety of effective sizes that correspond to a range of scientific objectives and roles for the Center. For a given level of financial resources, the appropriate share of the budget to be dedicated to labor and fixed costs is a function of many factors, including staff travel needs, potential emergency costs, and the history of investments in NWFSC in recent years.

A challenge in this rightsizing assessment across centers and divisions was the importance of comparing apples to apples, given the different situations that different centers, facilities, and divisions face. For example, different centers have larger or smaller portions of their research portfolio executed by cooperative institutes or university partners; and some divisions pay facility costs directly, as is the case with the Environmental and Fisheries Sciences (EFS) Division and the Manchester Research Station at NWFSC.

We considered the longer project title of Promoting Dynamic and Resilient Fisheries Science Centers (ReFishSci) to note that the optimal size of NWFSC is likely to change, but have in the end embraced the term "rightsizing." We believe the ideal size of the Center will vary with different resource management objectives, a changing share of reimbursable and temporary budget funding, and the desire or necessity to fund additional research areas such as climate research. Here we try to provide some insight into how the Center can best adjust the share of nondiscretionary spending in the total Center budget.

1.2 Brief History and Background on Programmatic Changes at NWFSC

NWFSC has had many noteworthy achievements in its history. Before 1990, scientists discovered the human health benefits of omega-3 fatty acids in fish; pioneered use of genetic data in fishery management; and developed PIT-tag technology to mark and passively monitor individual fish. In 1988, the Center was split into NWFSC and the Alaska Fisheries Science Center (AFSC). In 1989, the *Exxon Valdez* spill occurred, and led to a long-term, multidisciplinary scientific response that expanded research across several divisions at NWFSC. The evolving nature of the Center's research and the demands that have been put upon it have contributed to the challenges of identifying the core priorities of the Center's research. Different salmon and marine mammal endangered species act listings have put large demands for new, results-focused research on the Center.

Consider some examples of its major accomplishments. In the 1990s, the Center:

- Widely applied passive integrated transponder (PIT) tagging technology to monitor movement and survival of hatchery and wild fish in natural environments.
- Developed the Evolutionarily Significant Unit (ESU) concept for listing salmon under the ESA.
- Conducted coastwide status reviews of all species of Pacific salmon, steelhead, and cutthroat trout.

- Developed scientific guidance for creating salmon recovery plans.
- Developed DNA technology as a high-resolution, nonlethal mark for individuals in fishery management applications.
- Created the Fishery Resource Analysis and Monitoring Division (FRAM) to begin rebuilding groundfish survey and assessment capacity.
- Developed and implemented, in collaboration with the Pacific Fishery Management Council (PFMC), a new stock assessment review process for benchmark assessments.

In 1995, NWFSC started conducting a survey independently from AFSC. A history of the NWFSC survey program can be found in Keller et al. (2017).

From 2000–10, examples of key NWFSC activities and accomplishments include:

- Applied DNA technology to hatchery and natural salmon populations to reconstruct molecular pedigrees and estimate reproductive success.
- Led sampling efforts, as well as analyses for pathogens and chemical contaminants, for seafood safety response post-Hurricane Katrina.
- Created and led technical recovery teams for development of ESA recovery plans for Pacific salmon and steelhead.
- Developed life-cycle models to assess viability of salmonid populations.
- Developed and reviewed numerous assessments of groundfish species for management, along with numerous rebuilding analyses that guided the successful rebuilding of two species.
- Initiated a major research program to aid recovery of Southern Resident killer whales (SRKWs).
- Developed and implemented the first groundfish observer program on the U.S. West Coast.
- Conducted the first joint NWFSC–Fisheries and Oceans Canada (DFO) acoustic trawl survey to support the Pacific hake stock assessment.
- Established the first comprehensive cost and earnings surveys of commercial fishing vessels operating on the U.S. West Coast.
- Identified the genetic mutation responsible for shellfish resistance to the toxins found in harmful algal blooms (HABs).
- Built an "end-to-end" ecosystem model to simulate the dynamics of the California Current ecosystem.

Two major events that occurred during this period were the 2010 *Deepwater Horizon* spill, which resulted in a redirection of NOAA scientists to assist in assessing the impacts; and budget sequestration in 2013, which caused significant, mandatory spending cuts at all federal agencies and had a dramatic and immediate financial and programmatic impact at NWFSC.

Some examples of major activities since 2011:

- Deployed first robotic water sampler for real-time monitoring of HABs.
- Implemented 100% observer coverage in the U.S. West Coast groundfish trawl catch share program, resulting in over 11,000 sea days in 2011.
- Conducted the first integrated ecosystem assessment (IEA) of the California Current ecosystem (Levin and Schwing 2011).
- Conducted the first Saildrone (unmanned surface vehicle) acoustic survey of the U.S. West Coast.[1]
- Developed the J-SCOPE forecasting system,[2] which produces 6- to 9-month forecasts of oceanographic conditions and sardine distributions off the coasts of Oregon and Washington (e.g., Norton et al. 2020).

[1] https://www.fisheries.noaa.gov/feature-story/evaluating-capabilities-new-technologies-west-coast-hake-survey
[2] http://www.nanoos.org/products/j-scope/

- Conducted stock assessments providing scientific advice that led to the rebuilding of overfished species.
- Completed annual coastwide groundfish and Southern California hook-and-line surveys using chartered vessels to provide cost-efficient environmental, biological, and biomass information for use in multiple stock assessments.
- Assumed forensics capability for NMFS, contributing scientific evidence to support all NMFS Office of Law Enforcement (OLE) casework.
- Developed the use of environmental DNA (eDNA) to survey marine environments for the presence of rare species and those difficult to sample in the wild (e.g., deepwater corals, harbor porpoise).
- Implemented a killer whale research program focused on evaluating limitations related to prey, disturbance, and health.

NWFSC monitored the ecosystem response to the removal of the Elwha River dams beginning 10 years prior to their removal (completed in 2014). Collaborators on this project included the Lower Elwha Klallam Tribe, the National Park Service, the Washington Department of Fish and Wildlife, the U.S. Geological Survey, and the U.S. Fish and Wildlife Service. NWFSC scientists are now called upon as experts for advice on future dam removals.

1.3 Comparisons Across Science Centers

Section 3 includes data that compare the size and funding differences across the NMFS science centers. The size of most of the centers has declined significantly over the last decade. NWFSC is unique among science centers in its reliance on reimbursable funds. As of FY 2020, the Center had 118 agreements with a total value of $18.0 million. This represents 69.5% of NMFS total reimbursable agreements and 72% of NMFS reimbursable funds for FY 2020. This ratio has remained largely stable for the past nine years.

NWFSC has a diverse group of stakeholders, some of whom have very specific interests, such as salmon and groundfish fishers; others include the broader American public, that gains from the preservation of protected resources and other work.

Cross-center comparisons are useful to help normalize the experience that centers are having of relatively constant budgets generally leading to a decrease in staff. They also allow leaders across centers to see where divisions have been reorganized or eliminated, and how this has impacted other centers. However, it should be noted that there are a number of reasons for caution when making comparisons across centers or divisions. These factors include:

- Different regional scientific challenges and needs.
- Differences in historical staffing levels.
- The share of work conducted by cooperative institutes and other partners.

One key takeaway from this experience is the value that many center leaders have gotten from even a brief discussion of these issues. More cross-center management analysis and the sharing of experiences is likely to lead to better science and less stress to staff in handling future changes in funding and/or staff levels.

2. Methods and Project Activities

The methods used to conduct research for this report involved a mixture of direct interviews, literature reviews, analyses of budget and planning data and documents, several half-day online retreats, and regular discussions with the NWFSC Leadership Team. Alan Haynie from AFSC and Seema Balwani from the National Environmental Satellite, Data, and Information Service (NESDIS) were on detail from June 2020 to March 2021 at NWFSC to conduct the research and write the final report. They worked closely with the Science Director and Deputy Science Director to shape the framework and the contents of the report, and Haynie was able to attend the annual project prioritization (APP) planning meetings and a related retreat to better understand the NWFSC strategic planning process.

The majority of the research was conducted during a seven-month period between August 2020 and February 2021, during which time the researchers collected and organized data, especially relating to labor and budget. In the early stages of research, four emergent focus areas were identified which formed the major sections of the report. The researchers conducted seventeen interviews with the Leadership Team and NWFSC staff that were directly related to this project, and held additional informal conversations to gather specific pieces of information or data as needed. In addition, Balwani conducted sixteen interviews for a related salmon project and participated in a salmon review for the West Coast Region (WCR), both of which helped form the content of the salmon portion of this report.

Toward the end of the project, a fifth emergent focus area, climate change research, was included in the project. Throughout the project we recognized that this was likely to be a higher scientific priority in a potential Biden Administration, but the election outcome was uncertain. Based on recent messages from NOAA leadership, our knowledge, and conversations with NWFSC staff, we have added a short climate-related section with suggestions for next steps.

The researchers discussed the project with and presented their results to the Leadership Team, and received valuable feedback on the scope and structure. Haynie conducted informal interviews with NOAA Fisheries leaders, including Acting Office of Science and Technology Director David Detlor, Director of Scientific Programs and Chief Science Advisor Cisco Werner, Senior Scientist for Ecosystems Jason Link, Senior Scientist for Economics Doug Lipton, and several science center directors.. The researchers held weekly meetings with NWFSC Science Director Kevin Werner, Deputy Science Director Mark Strom, and Planning Officer Hélène Scalliet to provide updates, obtain information, and ask questions. The researchers presented their initial findings to the NMFS Science Board (Cisco Werner and the directors of the six NMFS science centers) in January 2021.

Other than discussions with the West Coast Region, the Pacific Coastal Salmon Recovery Fund, and the University of Washington, the researchers did not interact with stakeholders outside of the Center. The nature of the relationships with stakeholder groups means that some relationships are much more developed than others. For example, the Bonneville Power Administration has provided NMFS research funding through long-term reimbursable projects.

The final report was submitted in March 2021. This NOAA white paper presents an edited version of that report.

2.1 Summary of Relevant NWFSC Data Used in the Analysis

In addition to the interviews and conversations that informed this project, we obtained budget, labor, and other data from several sources. Mark Strom provided various budget documents that were, in some cases, raw data and, in other cases, data prepared from different sources. Division directors and division coordinators provided a variety of related documents about their spending, reimbursable projects, and budget tracking processes.

Employee headcount data and costs across science centers were obtained from David Davis, who at the time was the NMFS Senior Workforce Planner. John Turrell, the NWFSC Financial Services Program Manager, provided budget allocation data and a variety of division-level staff information.

Two cross-center studies of Operations, Management, and Information (OMI) Division programs conducted at NWFSC were utilized. One of these was conducted recently by Senior Scientist M. Elizabeth Clarke (no date), and the other was conducted approximately a decade ago by NMFS Office of Science and Technology (OST) Deputy Director David Detlor while he was visiting NWFSC (D. Detlor, personal communication).

3. Budget and Labor Analyses

This section provides a summary of information we analyzed related to the total NWFSC budget, how NWFSC compares in certain ways to other centers, and how the number of employees and the labor costs for NWFSC's and other science centers' divisions have changed over time.

In order to address increasing labor costs in a flat-lined budget, NWFSC is attempting various methods to control costs. For example, the Center currently only backfills one position when two are terminated. NWFSC is also working with other NMFS offices in the region to leverage administrative functions and facilities needs.

3.1 Permanent, Temporary, and Reimbursable Funds

Figure 1 illustrates one of the core challenges faced by NWFSC. Base funds have been relatively constant in nominal (not inflation-adjusted) terms, while the cost per employee has increased, leading to far fewer employees working at the Center for a similar total labor cost.

As noted, NWFSC is unique among science centers in its reliance on reimbursable funds. Temporary funds are also a critical component of NWFSC operations, which is true of all science centers. Table 1 displays the changing NWFSC total budgets from fiscal year (FY) 2011 to FY 2020, broken

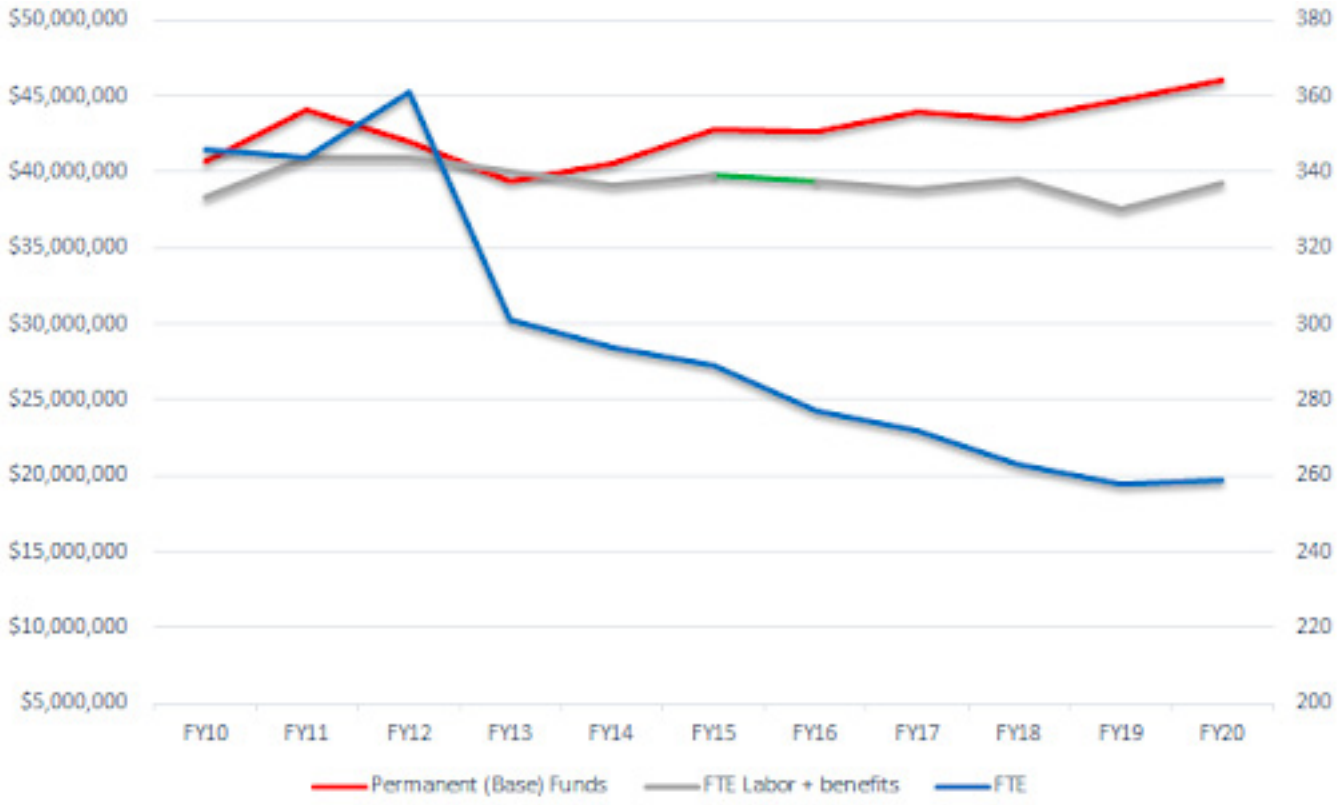

Figure 1. NWFSC permanent base funds vs. labor and full-time equivalent employees (FTEs), FY 2010–20.

Table 1. Summary of amount (in millions of dollars) and share of NWFSC funds, by source, FY 2011–20.

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Permanent (Base) Funds	44.1	42.0	39.4	40.6	42.8	42.7	44.0	43.4	44.7	46.0
Temporary Base Funds	14.3	14.1	15.1	18.1	18.8	17.4	15.5	18.9	16.5	18.0
Reimbursable Funds	27.8	24.0	21.4	20.1	21.0	21.5	20.0	20.1	17.2	17.3
NWFSC Total Budget ($ millions)	**86.3**	**80.1**	**75.9**	**78.8**	**82.6**	**81.5**	**79.4**	**82.5**	**78.3**	**81.3**
Permanent % of Total Budget	51%	52%	52%	52%	52%	52%	55%	53%	57%	57%
Temporary % of Total Budget	17%	18%	20%	23%	23%	21%	19%	23%	21%	22%
Reimbursable % of Total Budget	32%	30%	28%	25%	25%	26%	25%	24%	22%	21%

down by permanent, temporary, and reimbursable funds. Table 2 also shows the share of funds that comes from each source of funds for each year.

Tracking these three funding sources—permanent, temporary, and reimbursable—is not the only possible way to track the budget, but it is the standard, and the core element at NWFSC and most science centers. The Northeast Fisheries Science Center (NEFSC; Woods Hole, Massachusetts) tracks an additional category of budget, "permanent" funds that are specifically allocated to a purpose; NEFSC perceives the funding as less secure than other permanent funds. The importance of focusing effort by NWFSC scientists from reimbursable funds on key science priorities is described in more detail in the reimbursable funding emergent focus area, which includes the Reimbursable Funding Strategy (Section 5.1).

3.1.1 NWFSC funds by program, project, and activity (PPA)

NWFSC receives funds allocated by specific program, project, and activity (PPA), which are then allocated across divisions. The PPAs require that money received by NWFSC be directed for the specific purposes for which the money was intended. Figure 2 shows changes in the budget that have occurred for the major NWFSC PPAs from FY 2011–FY 2021.

While the existence of the PPAs is a reasonable means to ensure that money is spent in line with Congress's intentions, it presents challenges, as the Center must carefully track and balance spending across the matrix of PPAs and divisions. This lack of flexibility can create significant challenges when resources need to be redirected to meet emergent financial demands. At times, NWFSC receives less money than expected from Congress or NMFS headquarters, or WCR redirects funding from NWFSC to address higher-priority needs.

3.1.2 The burden rate and the lack of more flexible funds

Because of within-year budget uncertainty and unexpected costs or priorities that may arise in any division, a lack of discretionary resources makes any unexpected reduction in budget or increase in costs stressful to everyone balancing budgets. This also puts NWFSC leaders in the position of making difficult resource allocation decisions in a reactionary manner, rather than as part of a comprehensive annual planning process.

One question this project attempts to address is the share of the NWFSC budget spent on nondiscretionary expenses, here referred to as the "burden rate." NWFSC currently does not have a target burden rate, but should consider establishing one. This

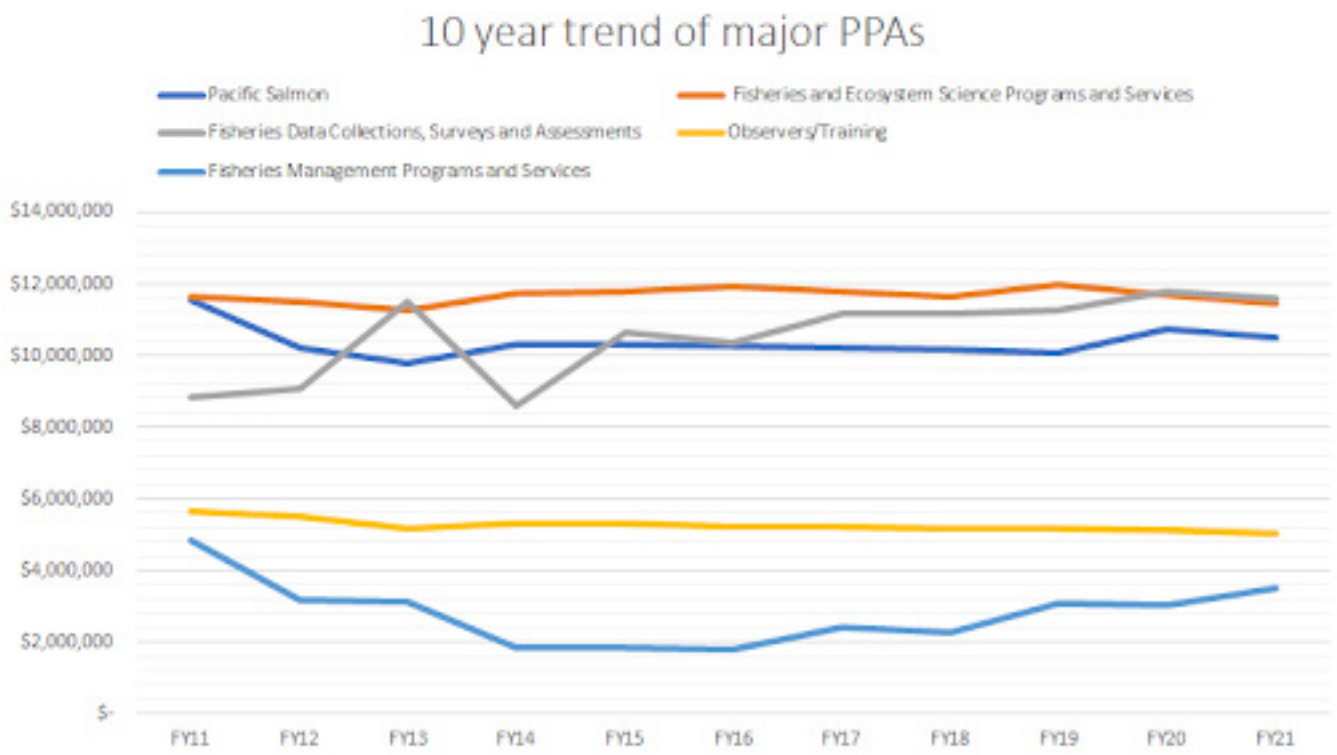

Figure 2. NWFSC budget by program, project, and activity (PPA), FY 2011–21.

would provide a ratio that would quickly indicate to Center and NMFS leadership whether the Center is within its parameters for discretionary vs. nondiscretionary spending. Calculating the NWFSC burden rate is complicated by the complex interaction of funding by PPA and permanent, temporary, and reimbursable funding sources. Nonetheless, over time, tracking the burden rate will help Center leaders track how well they are able to react within-budget to unexpected costs or budget cuts.

Nondiscretionary spending includes fixed costs such as labor, benefits, and facilities costs. The total budget for NWFSC could be considered as the permanent budget plus some fraction of temporary and reimbursable money that is secure, and not essentially pass-through money to contractors or direct expenses in support of reimbursable research. The burden rate is the ratio of nondiscretionary spending to total spending. If the Center were to establish a target burden rate of 85%, the nondiscretionary spending (fixed costs) would equal 85% of the total budget, with the remaining 15% left for discretionary spending. The West Coast Region aims for a burden rate of 85%, although the Center and each of its divisions and facilities have different types of discretionary demands; therefore, a different target burden rate may be appropriate.

Table 2 shows the share of the NWFSC budget that was spent on labor between 2011 and 2018. This information is not readily available for all years, but NWFSC administrative overhead costs for FY 2020 were budgeted at $8.5 million; these costs included facilities, IT, and other nonlabor fixed costs.

To estimate an appropriate burden rate for NWFSC, several factors need to be considered. First, the amount of discretionary money available across programs and PPAs needs to be tracked. Using the information in the table above and the FY 2020 administrative overhead cost budget of $8.5 million, the ratio

Table 2. NWFSC full-time employees (FTEs), labor costs, and different funding sources (in thousands of dollars) compared to types of funding sources, FY 2011–18. Source: Labor costs from D. Davis (NMFS), funds from M. Strom and J. Turrell (NWFSC).

	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18
FTE	344.0	361.0	301.0	294.0	289.0	277.0	272.0	263.0
Permanent (Base) Funds	44.1	42.0	39.4	40.6	42.8	42.7	44.0	43.4
Temporary Base Funds	14.3	14.1	15.1	18.1	18.8	17.4	15.5	18.9
Reimbursable Funds	27.8	24.0	21.4	20.1	21.0	21.5	20.0	20.1
Total Budget	86.3	80.1	75.9	78.8	82.6	81.5	79.4	82.5
FTE Labor + Benefits	41.0	40.9	40.0	39.2	39.8	39.4	38.9	39.5
FTE Labor Paid from Reimbursables	8.5	7.0	6.8	5.8	5.8	5.5	4.9	5.1
Contract Labor			6.7	7.2	7.8	8.3	7.4	7.6

of labor + administrative costs to the permanent budget is >1 for the Center, but reimbursable and temporary funds are used to pay some labor costs. The Center's budget also pays contract labor and a variety of other nondiscretionary costs.

Across PPAs and NWFSC divisions, the burden rate is more diverse, depending on the level of reliance on reimbursable funds. The burden rate for some divisions and PPAs is well above 100%, while for others it is well below. As different divisions depend on different levels of contract labor, the burden rate may not always reveal how much of the budget is actually discretionary or fungible. Table 3 shows a burden rate by PPA for FY 2020. The rate is impacted by the broad variety of costs of the different PPAs and how much work within the PPA is done by federal vs. other labor.

There are a number of factors that impact what would be the best burden rate for the Center. It might not be static over time—as, for example, when certain work is shifted from contract to federal labor. The presence of discretionary money allows what it implies—the discretion to spend money across various potential uses in a given year.

Different burden rates can be estimated using the information in Tables 2 and 3, the administrative overhead costs for the Center, and additional information on the types of overhead and labor costs paid by temporary

Table 3. NWFSC burden rate per PPA for FY 2020. Source: M. Strom (NWFSC).

PPA	FY 20	FY 20 Labor	Internal Fund	Burden Rate
Marine Mammals	$1,342,207	$1,326,946	$241,597	117%
Pacific Salmon	$10,729,393	$9,381,930	$1,931,291	105%
Fisheries and Ecosystem Science	$11,697,121	$7,861,731	$2,105,482	85%
Data Collections, Surveys, and Assessments	$11,768,681	$5,698,705	$2,118,363	66%
Observers/Training	$5,111,108	$1,473,651	$919,999	47%
Fisheries Management	$3,046,513	$1,982,691	$548,372	83%
Aquaculture	$1,434,051	$1,366,945	$258,129	113%
Enforcement	$388,814	$568,596	$69,987	164%
Habitat	$510,536	$622,013	$91,896	140%
Internal Fund	$0	$5,985,282	$0	
Totals	**$46,028,424**	**$36,268,489**	**$8,285,116**	**97%**

funds across divisions and PPAs. In the future, consistently tracking this information will help to ensure that the Center has enough discretionary money to handle the budget uncertainties that it will continue to face.

While some level of flexibility is desirable, a lower burden rate may also imply a smaller number of federal employee scientists. There is a real trade-off to be made here. Choosing to maintain a lower burden rate may lead to a greater share of labor being contract labor. Having permanent federal staff allows NWFSC to develop long-term human capital in a research area and to learn the complex relationships across the Center and its partners, improving their effectiveness and the integration of the Center. At the same time, it reduces the future flexibility of allocating resources. Hiring more-flexible federal employees is perhaps the best option, but this option is not always available and may reduce employee retention.

3.2 Employee Count and Labor Cost Comparison Across NMFS Science Centers

Figure 3 illustrates the changing labor costs across centers from FY 2008–FY 2020, which are also summarized below in Table 4. Because there are idiosyncratic variations in the budget from year to year across centers, in Table 4 we compare the percentage changes from the three years at the beginning of available data to the last three years.

Table 4 shows that headcounts have declined at all science centers except for the Pacific Islands Fisheries Science Center (PIFSC), which went up slightly due to a decision to reduce costs by transferring some staff from the cooperative institute to federal staff. Total labor costs increased slightly at NWFSC and on average across science centers, with variation impacted by a range of factors, such as the age and length of service of staff at each center. The costs per employee increased by 33% on average across the science centers, although the majority of this cost increase was due to inflation. Adjusting for inflation, the average cost per employee across all centers increased by 13% while the total labor budget declined by 10%.

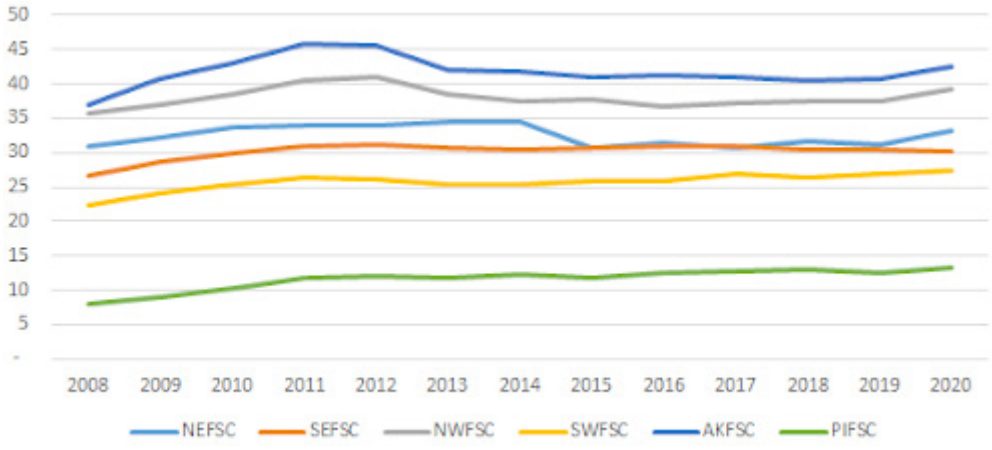

Figure 3. NMFS science center labor costs (in millions of dollars), FY 2008–20.

Table 4. Changing headcounts, labor costs, and costs per employee, individually and across all NMFS science centers, FY 2008–20. FMC = financial management center.

	Headcount			Labor costs (millions)			Cost (thousands)/employee		
FMC	FY 08–10 average	FY 18–20 average	Change	FY 08–10 average	FY 18–20 average	Change	FY 08–10 average	FY 18–20 average	Change
NEFSC	293	220	–25%	$32.3	$32.0	–1%	$110	$145	32%
SEFSC	274	232	–15%	$28.4	$30.4	7%	$104	$131	26%
NWFSC	370	265	–28%	$37.1	$38.1	3%	$100	$144	43%
SWFSC	196	174	–11%	$23.9	$27.0	13%	$122	$155	27%
AFSC	404	309	–24%	$40.3	$41.3	3%	$100	$134	34%
PIFSC	91	100	10%	$9.1	$13.0	42%	$100	$130	29%
Total	1,626	1,300	–20%	$171.1	$181.8	6%	$105	$140	33%
Inflation-adjusted total (deflated to 2015)				**$188.1**	**$169.4**	**–10%**	**$116**	**$130**	**13%**

Tables 5 and 6 provide a cross-center view of how staff levels and costs have changed among all of the divisions in all of the NMFS science centers. At a number of centers, programs have been abolished, combined, or created; data are shown for available years.

As is true with the centers as a whole, it should be noted that the number of employees and the cost per employee changed across divisions for various reasons. For example, in some cases, certain types of employees (like senior scientists) were included in the center director's office, work was shifted from temporary to contract employees, or lower-wage and earlier-career term employee positions were eliminated in response to sequestration or other funding changes.

3.3 NWFSC Cross-Division Comparisons

3.3.1 Headcounts

Table 7 and Figure 4 show the changes in NWFSC staff by division. Note that the large change from one year to the next in some years demonstrates how the base year used for comparison can have a significant impact on the long-term trend.

The large reductions in the Fish Ecology (FE) and Environmental and Fisheries Sciences (EFS) Division headcounts are primarily due to a reduction in term employees. The large increase in staff in the Office of the Science Director (SD) is primarily due to the shift of senior scientists and communications staff to this office.

3.3.2 NWFSC federal labor cost by division

Table 8 and Figure 5 show the changes in the total federal labor cost in each NWFSC division from FY 2008 to FY 2020. The changes in budget are impacted by the same factors discussed above that impacted the headcount per division, as well as by the different demographics and grades of employees in each division.

Table 5. Headcounts and change in federal employee headcounts across NMFS science center divisions, FY 2008–20.[*]

FMC	Division	08	09	10	11	12	13	14	15	16	17	18	19	20	08–20
AFSC	Directorate Office	5	5	5	5	6	5	4	4	4	3	1	3	3	–40%
	Auke Bay Laboratories	81	79	79	85	77	62	63	62	63	61	61	56	60	–26%
	Fisheries Monitoring and Analysis	38	39	37	35	32	33	35	34	34	34	31	35	32	–16%
	Marine Mammal Laboratory	58	68	67	73	72	65	61	56	55	53	48	44	45	–22%
	Operations, Management, and Information Services	26	27	29	30	26	23	22	22	21	19	19	31	26	0%
	Resource Assessment and Conservation Engineering	129	138	132	127	119	110	103	96	99	98	98	91	97	–25%
	Resource Ecology and Fisheries Management	54	55	60	59	58	54	54	54	50	51	50	47	48	–11%
NEFSC	Science and Research Directorate	39	41	42	38	37	37	37	34	33	23	25	23	22	–44%
	Aquaculture and Enhancement	31	32	33	33	30	30	29	25	24					–100%
	Ecosystem Processes	49	41	41	42	42	43	39	32	31					–100%
	Ecosystems and Aquaculture										49	45	44	45	**
	Fishery Monitoring and Research										15	19	19	21	**
	National Systematics Laboratory	8	8	8	8	8	8	8							–100%
	Operations, Management, and Information Technology	36	35	37	39	35	31	31	26	28	27	26	22	23	–36%
	Populations and Ecosystem Monitoring and Analysis	59	65	61	59	57	56	54	49	47	31	30	30	36	–39%
	Resource Evaluation and Assessment	69	72	71	74	72	75	73	70	71	77	77	77	77	12%
NWFSC	Office of the Science Director	6	6	6	6	6	8	13	13	12	12	12	12	12	100%
	Conservation Biology	57	56	59	60	63	56	55	53	51	49	50	47	45	–21%
	Environmental and Fisheries Sciences	39	38	42	46	49	43	37	71	66	66	65	63	64	64%
	Environmental Conservation	62	65	48	47	44	37	35							**
	Fish Ecology Division	139	92	91	94	88	74	70	66	57	55	55	57	57	–59%
	Fishery Resource Analysis and Monitoring	45	51	48	53	57	56	54	55	56	57	57	53	54	20%
	Operations, Management, and Information	53	52	54	59	52	47	37	34	35	34	31	30	32	–40%
PIFSC	Pacific Islands Fisheries Science Center Directorate	8	9	13	18	21	23	20	4	6	5	11	5	6	–25%
	Coral Reef Ecosystem	8	6	5	5	4	5	5							**
	Ecosystems and Oceanography	6	6	7	7	6	6	6							**
	Ecosystem Sciences								13	12	14	15	18	20	**
	Fisheries Biology and Stock Assessment	19	19	20											**
	Fisheries Research and Monitoring				29	27	27	29	30	30	31	28	27	25	**
	Fishery Monitoring and Socioeconomics	10	13	9											**
	Operations, Management, and Information	23	27	30	31	27	24	27	22	25	23	24	18	17	–26%
	Protected Species	10	11	14	15	15	14	15	15	17	17	16	17	17	70%
	Science Operations								11	10	13	12	11	13	**
SEFSC	Directorate Office	13	14	14	15	15	12	12	13	13	14	13	12	14	8%
	Beaufort Laboratory	31	30	29	31	31	29	29	27	30	32	33	33	30	–3%
	Galveston Laboratory	28	31	31	35	35	35	34	34	33	29	26	27	22	–21%
	Mississippi Laboratories	59	65	65	64	63	63	60	56	54	52	55	54	50	–15%
	Operations, Management, and Information	27	28	28	27	27	26	24	24	24	22	18	18	20	–26%
	Marine Mammal and Sea Turtle	27	26	26	28	27	24	23	23	22	24	24	23	20	–26%
	Sustainable Fisheries	87	82	80	82	83	81	79	79	78	74	69	65	69	–21%
SWFSC	Director's Office	9	9	10	9	8	8	7	7	7	6	6	6	7	–22%
	Antarctic Ecosystem Research	7	9	11	11	10	10	10	11	12	11	11	12	14	100%
	Environmental Research	12	13	13	13	12	11	11	11	11	10	11	12	12	0%
	Fisheries Ecology	41	44	44	46	46	47	45	47	44	47	44	42	42	2%
	Fisheries Resources	47	52	50	49	46	43	40	42	40	42	37	39	38	–19%
	Operations, Management, and Information	27	28	27	26	28	27	26	24	25	24	27	26	28	4%
	Marine Mammal and Turtle	47	43	44	51	50	46	47	44	40	42	40	35	32	–32%

[*] In some cases, especially for SEFSC, the divisional structure is different than how these headcounts are tracked over time by NOAA Headquarters.
[**] Percent change is not shown for programs that started or ended between 2008 and 2020.

Table 6. Federal employee labor (cost + 28% benefits) per employee and change over time across NMFS science center divisions, FY 2008–20 (in thousands of dollars).[*]

FMC	Division	08	09	10	11	12	13	14	15	16	17	18	19	20	08–20
AFSC	Directorate Office	150	158	166	169	176	172	202	204	206	217	210	200	207	38%
	Auke Bay Laboratories	89	92	98	106	119	119	121	123	122	125	127	124	127	42%
	Fisheries Monitoring and Analysis	78	82	89	92	98	99	98	97	101	106	112	107	111	43%
	Marine Mammal Laboratory	103	105	110	111	114	119	125	131	136	138	142	151	150	45%
	Operations, Management, and Information Services	105	107	112	117	128	133	134	137	141	146	148	142	154	46%
	Resource Assessment and Conservation Engineering	92	97	103	108	113	115	117	121	122	123	127	129	131	42%
	Resource Ecology and Fisheries Management	102	112	115	123	125	130	133	135	138	139	143	144	150	48%
NEFSC	Science and Research Directorate	115	115	128	128	129	134	141	145	148	143	148	147	159	38%
	Aquaculture and Enhancement	106	113	115	114	121	123	125	124	126					**
	Ecosystem Processes	107	108	113	112	117	120	123	126	129					**
	Ecosystems and Aquaculture										130	134	136	139	**
	Fishery Monitoring and Research										132	141	144	150	**
	National Systematics Laboratory	125	136	143	145	147	149	153							**
	Operations, Management, and Information Technology	96	103	108	108	115	118	121	127	127	128	135	139	147	54%
	Populations and Ecosystem Monitoring and Analysis	94	97	101	102	108	109	112	118	124	130	129	125	128	37%
	Resource Evaluation and Assessment	116	116	122	123	128	130	133	136	142	150	154	159	161	38%
NWFSC	Office of the Science Director	143	150	156	144	150	164	150	154	159	158	161	173	179	25%
	Conservation Biology	101	111	120	121	124	132	136	142	146	152	158	162	169	67%
	Environmental and Fisheries Sciences	103	113	113	112	113	119	126	129	133	137	139	144	150	45%
	Environmental Conservation	103	109	111	117	120	122	125							**
	Fish Ecology Division	66	87	107	104	107	117	121	125	128	131	133	137	143	117%
	Fishery Resource Analysis and Monitoring	100	103	109	110	110	113	117	122	123	127	130	133	138	38%
	Operations, Management, and Information	95	100	100	103	109	112	118	119	121	127	127	131	136	43%
PIFSC	Pacific Islands Fisheries Science Center Directorate	99	96	114	115	116	109	108	146	150	153	102	137	148	50%
	Coral Reef Ecosystem	97	97	106	103	130	129	137							**
	Ecosystems and Oceanography	108	116	103	114	135	139	133							**
	Ecosystem Sciences								138	140	145	147	140	137	**
	Fisheries Biology and Stock Assessment	100	106	115											**
	Fisheries Research and Monitoring				121	132	129	129	131	133	130	137	134	141	**
	Fishery Monitoring and Socioeconomics	96	100	106											**
	Operations, Management, and Information	89	90	95	102	111	111	118	121	114	119	117	131	136	52%
	Protected Species	95	99	104	110	110	116	117	123	125	118	120	119	124	31%
	Science Operations								85	87	94	103	114	129	**
SEFSC	Directorate Office	132	142	141	131	133	144	149	153	153	153	162	177	171	30%
	Beaufort Laboratory	90	97	101	103	99	104	107	111	106	109	112	116	124	38%
	Galveston Laboratory	111	111	112	108	110	111	112	115	119	117	120	125	132	19%
	Mississippi Laboratories	99	103	107	107	107	110	114	117	121	126	127	129	131	33%
	Operations, Management, and Information	112	118	123	124	126	126	128	131	132	136	144	152	143	28%
	Marine Mammal and Sea Turtle	105	115	121	124	128	128	131	133	138	139	145	147	147	40%
	Sustainable Fisheries	84	91	98	102	105	107	111	114	118	121	122	125	128	53%
SWFSC	Director's Office	141	162	152	170	168	169	167	170	172	164	169	171	183	29%
	Antarctic Ecosystem Research	130	124	122	128	140	143	146	144	152	156	160	167	148	14%
	Environmental Research	127	134	141	143	140	144	156	159	162	174	174	171	179	41%
	Fisheries Ecology	126	132	137	138	139	142	146	148	152	154	155	162	167	32%
	Fisheries Resources	118	115	121	125	126	127	129	131	137	139	145	150	151	27%
	Operations, Management, and Information	100	108	110	114	116	116	118	119	127	134	134	145	146	46%
	Marine Mammal and Turtle	109	119	126	121	124	127	131	139	146	149	151	155	161	48%

[*] In some cases, especially for SEFSC, the divisional structure is different than how these headcounts are tracked over time by NOAA Headquarters.
[**] Percent change is not shown for programs that started or ended between 2008 and 2020.

Table 7. NWFSC employee headcount by division and the year-over-year change, FY 2008–20.

Division	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2008–20
CB	57	56	59	60	63	56	55	53	51	49	50	47	45	–21%
EFS	101	103	90	93	93	80	72	71	66	66	65	63	64	–37%
FE	139	92	91	94	88	74	70	66	57	55	55	57	57	–59%
FRAM	45	51	48	53	57	56	54	55	56	57	57	53	54	20%
OMI	53	52	54	59	52	47	37	34	35	34	31	30	32	–40%
SD	6	6	6	6	6	8	13	13	12	12	12	12	12	100%
						% Change in Employees from Previous Year								
CB		–2%	5%	2%	5%	–11%	–2%	–4%	–4%	–4%	2%	–6%	–4%	
EFS		2%	–13%	3%	0%	–14%	–10%	–1%	–7%	0%	–2%	–3%	2%	
FE		–34%	–1%	3%	–6%	–16%	–5%	–6%	–14%	–4%	0%	4%	0%	
FRAM		13%	–6%	10%	8%	–2%	–4%	2%	2%	2%	0%	–7%	2%	
OMI		–2%	4%	9%	–12%	–10%	–21%	–8%	3%	–3%	–9%	–3%	7%	
SD		0%	0%	0%	0%	33%	63%	0%	–8%	0%	0%	0%	0%	

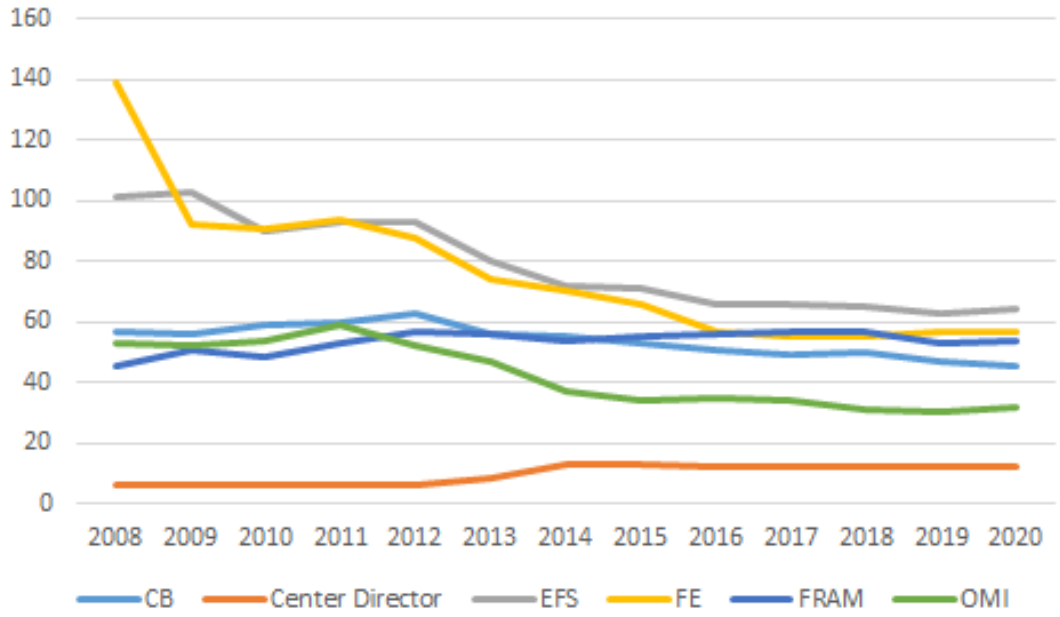

Figure 4. Number of federal employees (headcount) per year and NWFSC division, FY 2008–20.

Table 8. NWFSC federal labor cost per division (in millions of dollars), FY 2008–20.

Division	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
CB	$5.8	$6.2	$7.1	$7.3	$7.8	$7.4	$7.5	$7.5	$7.4	$7.4	$7.9	$7.6	$7.6
EFS	$10.4	$11.4	$10.1	$10.6	$10.8	$9.6	$9.0	$9.2	$8.8	$9.1	$9.0	$9.0	$9.6
FE	$9.2	$8.0	$9.7	$9.8	$9.5	$8.6	$8.5	$8.3	$7.3	$7.2	$7.3	$7.8	$8.1
FRAM	$4.5	$5.3	$5.2	$5.8	$6.3	$6.3	$6.3	$6.7	$6.9	$7.2	$7.4	$7.1	$7.5
OMI	$5.0	$5.2	$5.4	$6.1	$5.7	$5.2	$4.4	$4.0	$4.2	$4.3	$3.9	$3.9	$4.4
SD	$0.9	$0.9	$0.9	$0.9	$0.9	$1.3	$2.0	$2.0	$1.9	$1.9	$1.9	$2.1	$2.1

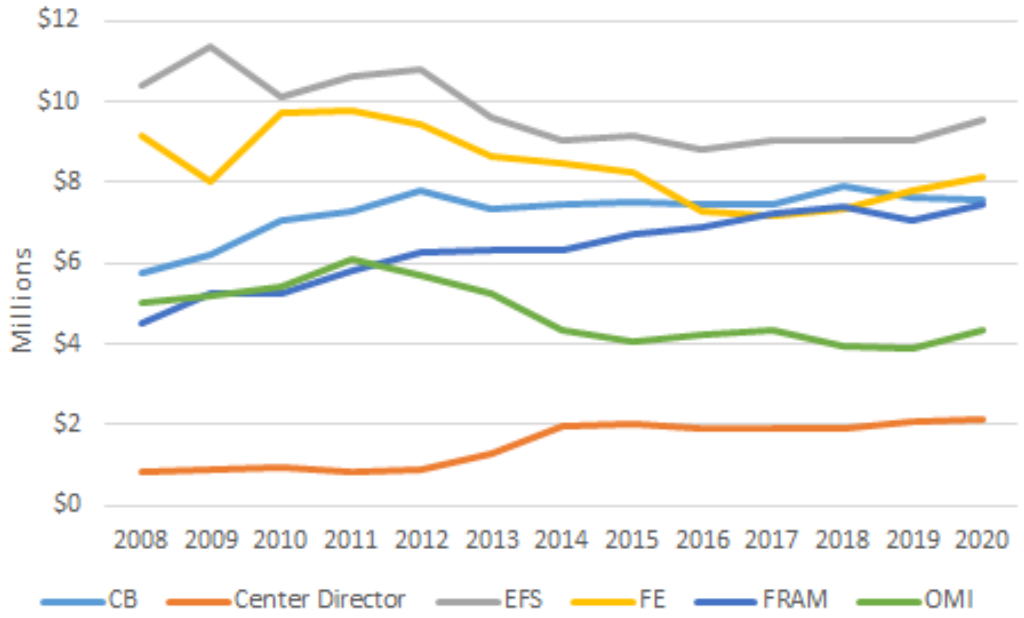

Figure 5. NWFSC federal labor cost per division, FY 2008–20.

3.3.3 Cost per employee by division

This section focuses on the change in average federal labor cost per employee (with 28% benefits included in the costs displayed). This section combines the data in the two sections above to show how the per-employee costs have changed across divisions from FY 2008 to FY 2020. The bottom portion of Table 9 shows the specific years when there were relatively larger changes in each division. Figure 6 also displays these trends.

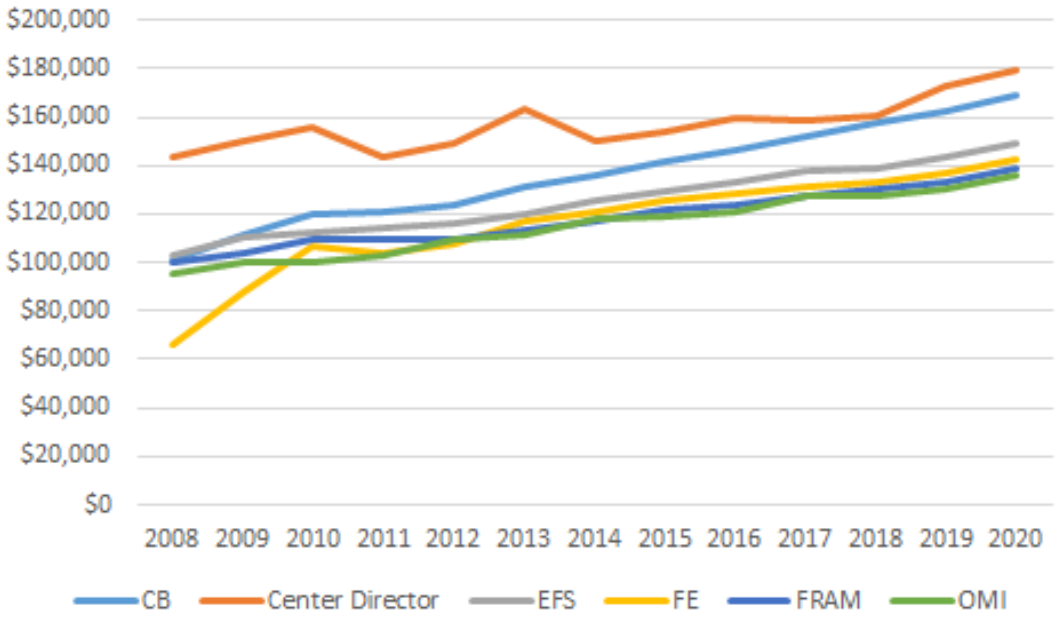

Figure 6. Labor + 28% benefits/employee/year, by division, FY 2008–20.

Table 9. Labor + 28% benefits/employee/year, by division, and the change from the previous year, FY 2008–20.

Division	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2008–20
CB	$101,341	$111,050	$119,918	$121,278	$123,922	$131,580	$135,757	$141,503	$146,035	$151,800	$158,010	$162,368	$168,750	67%
EFS	$102,846	$110,244	$112,161	$114,257	$116,366	$120,181	$125,416	$129,345	$133,381	$137,450	$138,974	$143,548	$149,518	45%
FE	$65,860	$87,447	$106,586	$104,248	$107,442	$116,683	$121,166	$125,409	$128,377	$130,948	$133,095	$137,253	$142,670	117%
FRAM	$100,369	$103,496	$109,154	$109,554	$109,782	$113,139	$117,421	$122,148	$123,458	$127,079	$130,238	$133,397	$138,411	38%
OMI	$95,041	$100,412	$100,421	$102,990	$109,257	$111,640	$117,587	$118,667	$121,008	$127,427	$127,218	$130,595	$136,258	43%
SD	$143,355	$149,926	$155,887	$143,644	$149,523	$163,794	$150,039	$153,642	$159,492	$158,287	$160,960	$173,176	$179,117	25%
						% Change in Cost/Employee from Previous Year								
CB		9.6%	8.0%	1.1%	2.2%	6.2%	3.2%	4.2%	3.2%	3.9%	4.1%	2.8%	3.9%	
EFS		7.2%	1.7%	1.9%	1.8%	3.3%	4.4%	3.1%	3.1%	3.1%	1.1%	3.3%	4.2%	
FE		32.8%	21.9%	-2.2%	3.1%	8.6%	3.8%	3.5%	2.4%	2.0%	1.6%	3.1%	3.9%	
FRAM		3.1%	5.5%	0.4%	0.2%	3.1%	3.8%	4.0%	1.1%	2.9%	2.5%	2.4%	3.8%	
OMI		5.7%	0.0%	2.6%	6.1%	2.2%	5.3%	0.9%	2.0%	5.3%	-0.2%	2.7%	4.3%	
SD		4.6%	4.0%	-7.9%	4.1%	9.5%	-8.4%	2.4%	3.8%	-0.8%	1.7%	7.6%	3.4%	

4. Emergent Focus Areas

Section 1 laid out the initial framing of the Rightsizing Project, but several emergent focus areas developed after initial discussions with the NWFSC Leadership Team and interviews with staff. The emphasis on these areas here should in no way indicate a lack of priority on other key research areas (such as stock assessment), but rather points to the areas that have been the focus of this project. We recognized that these areas allowed us to do "deep dives" and explore how several concrete changes in these areas could be beneficial to the Center:

1. The NWFSC Reimbursable Funding Strategy.
2. Transitioning employees to new roles.
3. Salmon research.
4. Planning and budget process integration. This area is the most diffuse of the focus areas, because it basically involves the effective integration of existing and future NWFSC scientific prioritization.
5. Climate change research.

These five focus areas are discussed in detail in the sections that follow.

5. The NWFSC Reimbursable Funding Strategy

This section describes the NWFSC Reimbursable Funding Strategy ("the Strategy") that has been developed for approval by the NWFSC Leadership Team. The intent of the Strategy is to provide clear guidance that NWFSC scientists should pursue reimbursable work when it expands the quantity and quality of their scientific research. However, it is absolutely essential that this work is in both the Center's and NMFS's priority research areas, as defined by the AGM and the NOAA and NMFS Strategic Plans (NOAA 2010, NMFS 2019). The section also includes suggestions on how to develop and gain approval for reimbursable funding agreements.

After implementation in 2021, we recommend that NWFSC conduct a brief review in 2023 to evaluate the success of the implementation.

5.1 Strategy Goals

NWFSC encourages its scientists and other staff to pursue new reimbursable projects to complement its core activities and to support innovative and cutting-edge research. Central to the success of this process is ensuring that the projects are tightly related to Center and NOAA scientific priorities.

Proposals for reimbursable funds must be evaluated based on the same criteria as the APP process, and undergo a Center review process in order to ensure that new reimbursable projects are focused on core NWFSC and NMFS scientific priorities. This aspect of the process is critical. The final decision to allow the research to go forward rests with the Center's Science Director and Deputy Science Director, but begins with support from the employee's supervisor and division director. The goal of the Strategy is to encourage innovation in important research areas. Employees who see opportunities to support cutting-edge research in new research directions that are not yet captured in NOAA and NWFSC scientific priorities should reach out to their division director with arguments justifying the investment of their valuable time and effort in the work.

While many Center partners support priority scientific research at NWFSC, the willingness of a funder to support certain work is not sufficient justification for pursuing reimbursable work. The Center has scarce resources, and work needs to be of the highest priority and value possible. The fact that work has previously been supported does not necessarily mean that it remains a priority in a smaller Center with fewer available resources. If a project receives a low score in the APP process, employees should obtain clear written permission from their division director before proposing that an external partner fund the same work.

5.2 Background and Benefits of Reimbursables

NWFSC work is supported through several funding sources. In addition to the majority of funds that come from the permanent "base" budget allocation and annual "temporary" or "temp" funds that NWFSC receives from NOAA sources, the Center also receives "reimbursable" funds from non-NOAA entities. Center scientists and other staff conduct a wide variety of valuable research activities, providing leadership and direct value to our stakeholders and the nation.

Despite the significant efforts of scientists and support staff, the Center has a number of scientific mandates and priorities that it is not sufficiently funding and addressing. Pursuing reimbursable funding is one means of expanding the Center's impact to better reach its scientific goals and fulfill its mandates.

Federal reimbursable agreements allow NWFSC to perform work on behalf of others and then be reimbursed for the work performed. Reimbursable funds allow the Center to pursue priority research activities that would not be possible with NOAA base or temp funding alone. In some cases, such as the activities funded by the Fish and Wildlife Coordination Act (FWCA), funds may arrive ahead of time or there may be slightly different arrangements. Here we use "reimbursable" to apply to all non-NOAA funding agreements.

Reimbursable funds support operations activities and provide labor support for permanent, temporary, and nonfederal (contractor) staff. Under current NOAA policy,[3] permanent federal employees should not be hired with new reimbursable funds; however, in the past, NWFSC was able to hire permanent federal staff and is thus currently dependent on reimbursable funds for some permanent labor costs. In addition, most reimbursable funding agreements provide support for overhead expenses. One significant additional benefit of reimbursable funding is its ability to support pilot projects that promote creativity and innovation, but have not obtained permanent financial support from NMFS Headquarters.

Reimbursable funds can complicate the budgeting process. The timing of the delivery of funds may cause stress if they are delayed, or, as is often the case, when they do not align with the Center's fiscal year. Certain reimbursable projects do not have long-term stability, another source of stress—especially for NWFSC division coordinators, who are in charge of processing many reimbursable agreements. In addition, reimbursable funding cannot be used to fund contractors (including post-docs) if their planned period of performance is longer than the period of performance of the reimbursable agreement. For this reason, except under rare circumstances, the use of reimbursable funds to support National Research Council (NRC) post-docs is not allowed at NWFSC.

It is also problematic when the deliverables defined in a reimbursable agreement's period of performance are not completed on time. Extending reimbursable agreements is costly to the Center, as it diverts the Deputy Science Director's, OMI budget staff's, and others' attention away from other priorities; this should be avoided whenever possible. Principal investigators (PIs) should strive to specify a reimbursable agreement's period of performance to provide an adequate time buffer for possible standard delays.

[3] https://www.noaa.gov/organization/administration/nao-216-109a-policy-on-reimbursable-research

5.3 Administrative Details: The Rules of the "Game"

This section is intended for NWFSC scientists who are considering pursuing reimbursable funds to support their project work.

By definition, NOAA funding opportunities support the NWFSC mission, but all external funding opportunities need to be evaluated to determine if they are aligned with the Center's and NOAA's scientific priorities. In this report, we generally use the term "reimbursables" to refer to all external non-NOAA funding opportunities, but there are some differences between formal reimbursable funding agreements and other non-NOAA funding arrangements. For example, work supported by the National Center for Ecological Analysis and Synthesis (NCEAS) and the National Fish and Wildlife Foundation (NFWF) is not funded through formal reimbursable agreements, so payment to NOAA Fisheries does not have to occur before the work can begin. Employees should refer to the information and related references in this report and any subsequent revisions published by NWFSC.

Here are some detailed rules to be aware of when you pursue funding outside of NOAA. Of course, in some cases, the Center has long-standing processes with certain partners, so please follow those processes as appropriate. The language below comes directly from the NOAA Finance Handbook, Section 10.04 (NOAA 2021), and is accordingly formal. Per the policy, NOAA will provide goods and/or services on a cost-reimbursable basis to federal agencies, states, local municipalities, private persons, profit-making businesses, and nonprofit organizations only when:

1. It is authorized by law.
2. NOAA's service would not be considered to be in competition with private enterprise. In the case of research activities and special studies, this would include projects that cannot be done at all, or done as effectively, by a private research agency because the basic data, knowledge, or facilities needed to accomplish the project are available only at NOAA.
3. The end results of the project will serve the public interest and are consistent with NOAA's programs.
4. Undertaking the project will not result in the diversion of resources to the detriment of NOAA's basic programs.
5. The results of NOAA's service, or the fact that NOAA has undertaken the service, will not result in controversy that will have an adverse effect upon the reputation of NOAA for impartiality and objectivity.
6. A written agreement is entered into covering the service to be performed; and such agreement will provide, unless determined otherwise for good reason shown, that no exclusive proprietary interest will accrue to the individual or group. The agreement will also provide that the results of special studies are the joint property of the individual or group and of NOAA, and that NOAA may publish or make use of the results of studies without any obligation to the sponsor.

Scientists interested in pursuing a new reimbursable project should draft a proposal confirming that the project is consistent with the criteria listed in NOAA (2021). In addition, the proposal should detail how the project aligns with the NWFSC mission and priorities (e.g., the most recent AGM and the NMFS and NOAA Strategic Plans). The reimbursement agreement amount and process are established by a negotiation process between NWFSC, NOAA, and the outside party.

The supervisor may approve the employee's further work on the proposal directly or may ask the division director for input. In addition to sharing correspondence with a potential funder, scientists should answer

the following questions in a letter to their supervisor when they ask for approval to develop a proposal. These questions are beyond the scope of the request for proposals (RFP; if one exists), and are intended to help NWFSC leadership decide if the potential project is a high-enough priority to the Center. This list should be adjusted as new relevant questions are identified, but should include:

1. What is the funding amount?
2. Is the proposed federal labor appropriate for the project?
3. Does the project provide financial support for contractors?
4. What is the project's expected duration?
5. Is the project supporting a pilot study? Provide details.
6. Does the project provide career development for staff?
7. How does the project support NMFS/ NWFSC research priorities?

After a supervisor's initial positive recommendation, the reimbursable project proposal should then always be developed and presented to the lead PI's division director. After the division director approves a project proposal, the NWFSC Science Director or Deputy Science Director will make a final decision approving or declining the project.

The division director overseeing the project should inform the Deputy Science Director if there are any significant changes in the project as it progresses, e.g., funding level, duration, changes in federal labor requirements, delays in deliverables, etc. Proposals accepted by the Science Director and Deputy Science Director will not immediately be included in the APP process, since the projects will be externally funded. However, the package of reimbursable projects will generally be reviewed by the LT on an annual basis as part of the APP.

Upon agreement between the Deputy Science Director and the lead PI's division director, certain projects which NWFSC has committed to for several years will not need to be re-reviewed annually and can be dated for when they will be re-reviewed or completed. This option is intended to eliminate unnecessary review of projects that will never be directly compared to others for funding and for which the Center has made a commitment to completing work within a predetermined amount of time.

If the project is approved by NWFSC and the funder, a formal written cost-reimbursable agreement between NOAA and the sponsor must be properly established prior to NOAA providing goods or performing services to the sponsor. A generic NOAA cost-reimbursable agreement model and other details about reimbursable funding agreements can be found in NOAA (2021, Chapter 10). NWFSC staff should consider the time of year when entering into new agreements with federal sponsors. Cost-reimbursable projects and funding accepted after approximately June may not allow enough time for NOAA to obligate or expend the funding within the federal sponsor's funding availability, especially where a federal sponsor provides NOAA with only one year of funding for a project. All proposed cost-reimbursable agreements are required to be reviewed and cleared by the NOAA Office of General Counsel. Employees should talk with their division coordinators if they have any questions. An agreement must be finalized prior to the performance of work.

NOAA's policy is that all nonfederal sponsors—except state and local governments and state-sponsored institutions (e.g., colleges and universities)—are required to make payment in advance, on an estimated basis, of the actual cost of the goods/services to be

provided by NOAA in a cost-reimbursable agreement. The conditions should be clearly detailed in the agreement. Advance payments can be accepted only for projects with an established agreement in place.

Some legal authorities, such as the Economy Act of 1932 and the Special Studies Authority (DOC 2011), require full cost recovery, and overhead charges under those authorities cannot be waived. Since it is generally NOAA's policy to recover full cost, the waiving of any overhead cost associated with reimbursable work can only be authorized by the Director of NOAA's Budget Office. Costs eligible for waiver depend on the cost-reimbursable agreement's legal authority.

5.4 Further Reading on Reimbursables

1. NOAA Administrative Order 216-109A (NOAA 2013) establishes NOAA policy for reimbursable research by NOAA laboratories.
2. The NOAA Finance Handbook (NOAA 2021) contains the complete guide to formulating agreements, including reimbursables, from the NMFS Office of Management and Budget (OMB). Chapter 10 of the Handbook includes a generic NOAA cost-reimbursable agreement model, and other details about reimbursable funding agreements.
3. NOAA Fisheries' Reimbursables and Other Agreements Handbook (NMFS 2016) assigns responsibilities and implements general standard operating policies and procedures for the different types of agreements NMFS may enter into.
4. The Economy Act of 1932 requires full cost recovery when one federal agency does work for another. Generally, the Economy Act should not be used if there is a more-specific authority to transfer funds. Both parties should work together to determine if a more-specific authority exists.

5.4.1 NOAA-specific authorities

The purpose of the Fish and Wildlife Coordination Act (FWCA) includes recognizing the contribution of wildlife resources to the nation, and ensuring that wildlife conservation receives equal consideration and coordination with other features of water-resource development programs through the effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation and rehabilitation. This allows NWFSC to survey and investigate the wildlife of the public domain, including lands and waters or interests therein acquired, or controlled by any federal agency of the United States, and to accept donations of land and contributions of funds in furtherance of the purposes of the act. The FWCA allows an agreement to show cost-sharing between the sponsor and NOAA.

6. Transitioning Employees to New Roles

With limited discretionary funds, one of NWFSC's primary means to address evolving scientific priorities is to have a relatively small number of scientists and other staff change their work focus by moving from lower-priority projects to higher-priority ones. Some employees have transitioned in this way with great success.

An NWFSC employee transition plan can be coupled with a vision of a more integrated Center, with employees who are cross-trained in disciplines. This would give employees not only the opportunity to explore alternative areas of focus in order to consider a job change, but also to share ideas, knowledge, and techniques across programs and divisions. Thus, this process would achieve three major goals:

1. Transfer human resources from low- to high-value research and work areas.
2. Break down disciplinary/divisional silos and promote interdisciplinary research and deeper technical awareness.
3. Create a more socially connected and intellectually dynamic work environment.

While a major goal of the transition process is to move employees from the lowest-priority research areas to the highest, all employees are free to consider changing jobs or research focus (subject to approval). In some cases, division directors may strongly encourage changes, but employees are also free to make the case that they could add more value to NWFSC in a new role. The Leadership Team (LT) can communicate the benefits of expanding the base of an employee's scientific knowledge, building a broader network, and gaining experience in growth areas of science.

6.1 Phase 1: Communicate with NWFSC Staff

The LT should begin to better familiarize staff with the idea of changing positions within NWFSC. This can be done by emphasizing both the importance of employee transitions in strengthening NWFSC's ability to achieve its mission and adapt to new priorities, and the desire to provide opportunities for staff to grow or be revitalized professionally. Not all job transfer actions have been easy or purely successful. Good communication before and during a transition can reduse the stress for everyone and increase the likelihood of success.

One way to promote the value of transitions is to share the stories of employees who have successfully changed roles. The LT can create a list of willing staff who have switched positions and share their names with the communications team. The communications team can interview several employees and write 1–2 page summaries of their experiences with job changes to give other staff ideas about the types of changes that have successfully occurred at NWFSC. A diversity of position changes should be highlighted, and the challenges of switching positions should be discussed as well. Three such interviews have already been conducted; the summaries are below.

The communications team should develop talking points for the LT to use in speaking about transitioning positions. It is important

that the idea of successful position change be linked to the overall idea of doing high-value science to achieve the Center's mission. Once the messaging is finalized, the LT should use every available option to disseminate the messaging to staff, including all-hands meetings, weekly updates, staff meetings, performance reviews, etc.

The messaging should have concise and clear statements about why transitioning employees is important, and what impacts it will have on NWFSC and the employees. It must address the questions staff will raise, including "How does this affect me?", "How will my performance plan change?", and "What will be my duty station?"

6.2 Phase 2: Assess Opportunities

Working with program managers and team leads, the LT can identify staff members who are in a good position to explore new opportunities. The following are steps the LT can take to determine where staff can be transitioned from and which projects staff can be transferred to:

1. Identify low-priority projects that could or should potentially be phased out.
    a. Review APP scores to identify lesser-ranked projects.
    b. Review HQ strategic planning documents (e.g., NOAA 2010, Link et al. 2015, NOAA 2015a, 2020b) to identify which initiatives have been de-emphasized.
2. Determine the growth areas at NWFSC in the next five years.
    a. Consider the priorities highlighted in the planning documents listed in Step 1b (above), which include topics such as aquaculture, the blue economy, and advanced tech (e.g., artificial intelligence and big data, unmanned aerial vehicles, etc.).
    b. Identify current high-priority and emerging projects and their programs that could use additional staffing.
3. Identify staff eligible for transition.
    a. Factor in projected retirement dates, where appropriate.

An important element of the rightsizing process is recognizing how program demographics will impact the workforce over the next decade.

- Many division directors have created a variety of tracking mechanisms to better understand potential future retirements.
- The information gleaned from the demographics tracking mechanism might provide insight into when a high-value position would be available to be backfilled from a lower-priority project/program.

Recommendation: Each division should make and share retirement estimates for the next five years to help the LT better plan the likelihood of future staff changes.

6.3 Phase 3: Work with Employees Who Are Identified to Change Jobs

1. Assess the employee.
   a. Include the current supervisor in the assessment.
   b. Review individual development plans and previous performance plans.
   c. Identify strengths, weaknesses, skills, and capabilities.
   d. Identify areas of interest and how education might be applied in new avenues.
   e. Are there any skills that have been underutilized in the current position?
2. Have a discussion with the employee.
   a. The current supervisor, as well as the new supervisor if one is known, should lead the discussion, which should include questions such as:
      - How does the employee find satisfaction in work life?
      - Is NWFSC getting the employee's best work, or is there a better way to utilize the employee's skills?
   b. Socialize the employee to the idea that change will happen, but re-emphasize NWFSC's support throughout the process.
   c. Help engage the employee in exploring new job opportunities, when appropriate.

6.4 Transition Plan

Our literature search suggests that a job transition should last about 90 days (but can be adjusted to circumstances), and includes the following steps:

1. Conduct a series of conversations with the employee (as outlined below).
2. Develop and execute a transition plan.
3. Adjust the employee's performance plan for the remainder of the fiscal year.
4. Change the budget line for the employee's labor costs, as appropriate.

A transition management process includes developing a job transition plan that outlines each step of the transition process so the expectations and timetable are clear to the employee. It is best if the employee assists in developing the transition plan, because the employee will have buy-in for the process, and because the development of the transition plan will create an opportunity to have honest conversations about the employee's needs and concerns. Honesty and transparency are key at this stage if trust is to be developed. The steps in the process are:

- Develop a written transition plan that provides a clearly defined transitioning schedule and maps out when certain changes/steps will be taken.
- In the transition plan, set clear expectations for the employee's new role and communicate them to the employee. Specify what tasks and deliverables will be the transitioning employee's responsibilities. Outline the new chain of command.
- Assign employee(s) to help train the transitioning employee. Specify who will conduct any specific training, and when. Training in the new discipline will help ensure the employee's success in the new program/division.
- Supervisors and Center leadership should be available for the transitioning employee. While many leaders are already overburdened, being available

for transitioning employees can make the process more effective and humane, with a stronger chance of success. At NWFSC, this effort could also be connected to a mentoring program.

Given the complexity of the people and programs involved, the Center may want to create a transition team to develop and execute the employee's transition plan. The team could include the employee's previous and new supervisor, and one or both division directors. Trainers and mentors could also be included on the team, as well as a liaison from the new program to help the employee understand the new program's culture and norms. The liaison would also help the transitioning employee build rapport and relationships with their new team members.

6.5 Communications Guidelines

In implementing every phase of the transition process, communication is critical. Supervisors and others helping with the employee's transition should say their messages often, and in different ways. Supervisors should build trust through consistent honesty and transparency. Conversations should boost engagement and excitement, and spark human connection. For employees in low-priority areas, supervisors should give signals and incentives (e.g., training, mentorship)—and clear direction when possible—that a successful transition to a new work area will be assisted, rewarded, and met with reasonable transition expectations. Supervisors should instill confidence in employees by pointing out that NWFSC is behind them and believes they can succeed. It is important for supervisors to explain that they are on their employees' side, want them to stay with the Center, and will help them develop to their fullest potential and capacity; supervisors should emphasize transition benefits such as professional development, new career networks, and new skills.

At the start of an actual job transition, new supervisors should sit down with employees and explain and reiterate why they are being transferred. The supervisor should speak authoritatively but also compassionately, so the employee understands that, while the decision has been made, NWFSC stands behind the employee to make it as seamless as possible. Listen to employee concerns, whatever they may be. Even if the employee is not completely content with the transition, airing concerns is important. If a new position is identified, the supervisor may wish to discuss the answers to the following questions: How do the employee's current skills translate to the new role? What are their main goals in the new position? What kind of learning curve will there be? Will there be a team culture shift or adjustment as a result?

The transition plan is also a communications tool. It should have clear agreements for all involved parties on how they will work together, how feedback will be given, and what success looks like during the transition period. New supervisors should work to ensure that new employees successfully find whatever they felt was missing in their old position.

The best way to ensure a successful transition is to make sure everyone, within reason, is on board and staying consistent with the mutually agreed-upon transition plan. It is important to ensure that the transitioning employee feels secure and successful. Also, do not underestimate the importance of listening to and supporting the needs of colleagues in both the old

and the new divisions. They will likely have concerns about the changes to their divisions. A transition team should bring several people to the conversation table, not just those at the executive level.

Finally, survey and track employee changes in a standardized process so that the LT can more easily review the overall success of transitions and use the lessons learned to guide future transitions. Since transitions can take anywhere from 30 days to a year or more, having one person in charge of monitoring the staff who have transitioned may be the easiest way to track successes and challenges.

6.6 Successes and Lessons Learned from Previous Transitions

Below are short summaries of three employee experiences with job transitions.

1. At NWFSC, one employee with 28 years of experience in her field "saw the writing on the wall" and realized that her area of research was no longer a priority for NOAA. She reached out to her supervisor, and together they determined that she could be moved to another division. The new position would utilize many of her existing skills, but also provide her an opportunity to learn new skills. It took her 6–8 months to feel like she was accustomed to her work, but she was able to make a successful transition. She credits her patient and compassionate supervisors, who provided space for training, helped improve her confidence, and provided clear direction and expectations.

2. Another NWFSC employee answered the call when her program was ending and another division needed help. The employee's skills were a perfect match for the new position, so she could bring her expertise with her. Still, she was nervous at the beginning. With the enthusiastic support of her new supervisor, she is now working successfully with more responsibility and an increased number of collaborations.

3. A third employee at NWFSC was given the opportunity to move from a declining program to a high-priority one that needed his help. He had already worked with the new program, and he realized that his skill set could be utilized in the new position. He had the support of both his old and new supervisors, and he was able to ease into the new program by working part-time in it at first, then gradually moving to full-time. The slower transition period made it easier for him. This employee felt that the transition went smoothly and, ultimately, rejuvenated his career. He credits the open communication with his supervisors as being critical, as well as the fact that his new office welcomed him with open arms. His flexibility and openness in trying something new allowed for a successful transition.

Overall, we can take away key lessons from these examples that helped facilitate successful transitions. The first is that open, transparent communication is integral to success. Old and new supervisors, as well as team members, should be supportive and on the same page during and after the transition. The supervisors should work with the employee to find the right position—preferably one that effectively utilizes the employee's skills and

expertise. The supervisors should set clear expectations for the employee, both in the old and new position, in order to ensure a smooth transition. Tools that might help in the process are training, mentorship opportunities, and a longer timeline to provide a more gradual transition.

There are also clear lessons about what not to do when transitioning employees.

The first lesson for supervisors and other leaders is to avoid sending mixed messages. If one supervisor supports the transition while the other does not, the effort will ultimately fail. By failing to be consistent, the supervisors and the employee will embark on a roller coaster with the outcome unclear and unstable. This painfully extends the rocky transition period.

The second is not having clear guidance from above. Although the details of a transition can be determined by program managers, supervisors, and division directors, the messaging should come from senior leadership. This shows staff members that the transition plan has the Center's full support, and provides the context for why the changes are being made.

7. Salmon Research

NWFSC has a long history on the U.S. West Coast working on Pacific salmon. The first Pacific salmon ESA listing occurred in 1989 for the Sacramento winter run Chinook salmon (USOFR 1989). Shortly thereafter, in 1991, NWFSC held its first salmon status reviews (Matthews and Waples 1991, Waples et al. 1991). Also in 1991, NMFS adopted a species definition for salmon under the ESA (Waples 1991). The first major five-year status review update for all ESUs came out in 2005 (Good et al. 2005), followed by Ford (2011), NWFSC (2015) and Ford (in press).

7.1 Budget and Labor

In 2021, NWFSC has approximately 259 federal employees, over half of whom are at least in part focused on Pacific salmon research. The West Coast Region, which includes NWFSC, the Southwest Fisheries Science Center, and the West Coast Regional Office, received $65 million in ESA salmon funding in FY 2020, and $67.1 million in funding in FY 2021. In FY 2021, NWFSC received $10.5 million in base funding for the Pacific salmon PPA, but will also receive a portion of the additional $2.1 million in funding that was provided by NMFS in this year.

NWFSC faces budgetary challenges in each of its programs, salmon included. These include rising labor and facilities costs in flat-lined budgets, and a historic dependence on reimbursable funding to support federal employee salaries. This has resulted in the entirety of salmon funding at NWFSC being allocated to labor and facilities, with minimal discretionary funding to support research-related expenses.

Since the burden rate for the Pacific salmon PPA is over 100%, reimbursable funding is critical to executing the mission and funding fixed costs. The majority of the reimbursable funding is provided by the Bonneville Power Administration (BPA). ESA salmon funding pays for approximately 20% of the Center's total federal employees. Term employees have traditionally been a large component of the workforce, but as a result of sequestration in 2013, many term employees' contracts were not renewed in order for NWFSC to balance its budget.

7.2 NWFSC Salmon Programs and Their Purpose

Abundant, robust wild fish populations to support cultural, economic, and recreational uses

As a steward of the Pacific Northwest ecosystem, the Center stands with a broad range of stakeholders who share a strong desire to maintain robust wild salmon runs as part of the regional culture. The Center, working with management, executes a coherent research agenda to improve the abundance and diversity of wild fish populations in the region. Research activities include life-cycle modeling to evaluate the robustness of populations across their life cycles; monitoring of changes in climate, hydrology, and ocean conditions over time; and physiological studies to better understand the adaptability of salmon as well as other interdependent species to their changing environment. Center scientists and staff successfully integrate their science into a wide range of management decisions impacting fish in the wild.

—NWFSC Vivid Description of the Future 2025 (NWFSC 2018)

Three divisions within NWFSC conduct the majority of its salmon research (see Figure 7). They are the Conservation Biology, the Environmental and Fisheries Sciences, and the Fish Ecology Divisions. NWFSC scientists work together to execute the vision described above to support abundant and robust wild fish populations. Scientists build partnerships with stakeholders including state and local governments, tribes, industry, academia, and NGOs, while supporting the needs of salmon managers within and outside of NMFS. In the following section, each division's scope of work and focus are described.

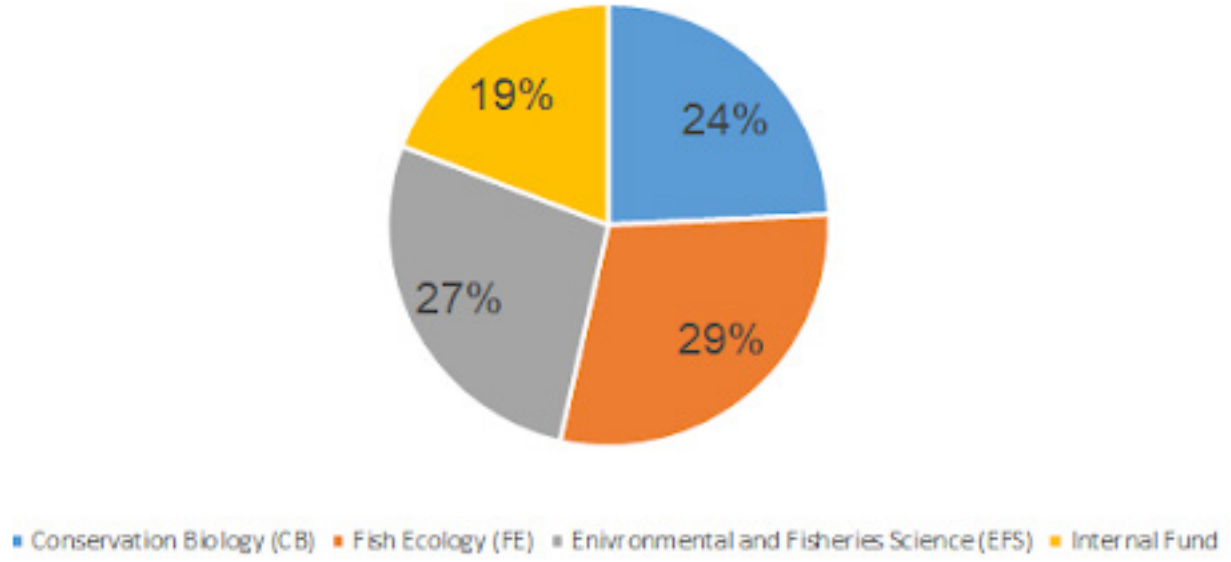

Figure 7. FY 2021 salmon funding allocation to Conservation Biology (CB), Environmental and Fisheries Sciences (EFS), and Fish Ecology (FE) Divisions and the internal fund. The internal fund consists of fixed costs such as management, administration, and common services. Source: NWFSC budget data.

7.2.1 Conservation Biology Division

The Conservation Biology Division (CB) has over 30 scientists who conduct a broad range of salmon research. CB scientists lead ESA activities, which include conducting analysis in support of status reviews (e.g., Ford 2011), managing data streams and databases related to salmon recovery,[4] addressing technical questions on salmon recovery plans, and providing science and support to WCR on Biological Opinions (BiOps) and other salmon-related regulations (e.g., Pess and Jordan 2019). BiOps ensure that federal agencies do not jeopardize the existence of a species or critical habitat with their activities. CB staff participate in regular meetings with WCR staff in order to stay connected with management needs. CB also works on issues related to the Magnuson–Stevens Fishery Conservation and Management Reauthorization Act of 2006 (MSA), which includes providing scientific support for the Pacific salmon treaty and PFMC.

CB scientists support salmon ecology by monitoring habitat and the effectiveness of restoration efforts (e.g., Barnas et al. 2015), evaluating the cost effectiveness of salmon recovery (e.g., Fonner and Warlick 2018), and modeling salmon life cycles. They work in the

[4] E.g., https://www.webapps.nwfsc.noaa.gov/apex/f?p=261:1:

ocean, in estuaries, and in nearshore habitats. They also conduct research on salmon as prey for killer whales (e.g., Hanson et al. 2021) and pinnipeds, and model the predicted effects of climate change on ocean distributions (e.g., Shelton et al. 2021) and freshwater habitat use (e.g., Battin et al. 2007).

One of the most groundbreaking research areas in CB has been salmon genetics. Genetics research serves to inform conservation and management and supports recovery. CB conducts species and stock identification for all the divisions at the Center. Genetics is used to identify spawning populations (e.g., Ford et al. 2004) and to evaluate juvenile salmon habitat use (e.g., Weitkamp et al. 2015) and stock composition of salmon caught in ocean fisheries, and evaluate hatchery effectiveness (e.g., Berntson et al. 2011) and the genetic basis of life-history variation (e.g., McKinney et al. 2021), often in collaboration with EFS. CB scientists also conduct genetic research on other species, such as corals (e.g., Everett et al. 2016), lingcod (e.g., Longo et al. 2020), and killer whales (e.g., Ford et al. 2018), among others. CB scientists also identify fish in support of BPA-funded reimbursable work led by EFS and FE, and in support of the Fisheries Resource Analysis and Monitoring (FRAM) Division's activities for the observer program. CB leadership identifies genetics as a very important part of the division.

CB leadership recommends that the Center carefully evaluate the tradeoffs between conducting fewer larger projects or more smaller projects, and consider the APP process for decisions on how to prioritize activities. There are pros and cons to doing a few large projects at a scale only the government can do versus doing smaller, cheaper, more evolutionary and nimble projects that enhance collaborations with tribes and states, and connect NWFSC into larger science communities. In either case, some evaluation and consolidation of the organizational chart at NWFSC might be helpful.

7.2.2 Environmental and Fisheries Sciences Division

At the time of writing, the Environmental and Fisheries Sciences Division (EFS) has 64 federal employees, about half of whom work on salmon issues. EFS scientists work closely with WCR to address management challenges, and collaborate closely with CB Division on genetics. They conduct salmon science focused on conservation and fisheries enhancement, which includes trying to understand the poor survival rate of steelhead and salmon when they enter the marine environment. EFS scientists examine factors affecting salmon survival, e.g., infrastructure (such as the Hood Canal bridge), pesticides, stormwater runoff, and water quality. According to this research, water quality is limiting salmon survival, pointing to the need for additional ecotoxicology research.

EFS scientists also study hatcheries that promote both conservation and production, and try to make salmon hatcheries more effective and less harmful to native stocks. For instance, EFS contributes to improving the effectiveness of hatchery management plans and recovery plans for Puget Sound steelhead through a combination of field research and empirical studies of live animals in captivity.

EFS leadership believes that the Center should capitalize on its expertise by collaborating more across divisions and taking more of a "One NOAA" approach, in which the Center and Region more strongly emphasize common goals. The Center should be more proactive and forward-thinking instead of reactive, focusing more on finding solutions than finding new problems. Another recommendation from EFS leadership involves conducting additional work to understand climatic changes in the ocean, because most salmon mortality occurs in the marine environment—Salish Sea steelhead survival is a good example. The government is capable of long-term

work, which is necessary for ocean research. The Center needs a robustly funded ocean science effort, instead of relying on BPA funding and temporary funds. EFS leadership suggests that the Center is too dispersed in its efforts, and should focus on the NMFS mission with fewer projects.

One EFS scientist engaged in coastal and ocean pollution research suggested that the Center should ask the question, "Salmon need cool, clean water to survive and thrive, so what science should the Center be providing to management to meet this goal?" The scientist suggested that the most important research for ESA-listed salmon recovery is science that demonstrably leads to cleaner waters and improved conservation outcomes, specifically ecotoxicology and contaminants research within the context of habitat degradation. NWFSC has unique skills and focus in environmental health, so it's a natural fit for the Center. However, reimbursable funding plays a critical yet complicated role in supporting this work, which can be a challenge. In the future, it will be important to ensure that scientists understand the big picture and direct research products to what will be impactful for management and for NOAA.

Another EFS interviewee is engaged in ecological research, specifically the effectiveness of hatcheries and their effects on natural populations, as well as research on predator–prey relationships in marine environments. Their program works closely with counterparts in CB and FE, including sharing papers and reporting, collaboration on projects, and coordinating through biweekly salmon recovery calls led by FE. This researcher recommends that the Center think about conducting fewer studies with more components and more investigators, but fewer targets. Projects could then be more impactful and collaborative. To determine where to focus, the scientist suggests talking to WCR to see what they need, then develop proposals. One priority could be the Puget Sound genetic risk work group, which includes CB and WCR along with state and tribal geneticists. The work group was started by WCR to ask questions about science in hatcheries. Other priorities are the Salish Sea Marine Survival Project[5] and the division's freshwater habitat work. Reimbursables and in-kind contributions are critical to the Project, as are the many collaborations that support its work (e.g., with the State of Washington, tribes, and NGOs). In the future, this scientist highlights that mission-focused work will be key, and needs to allow scientists to use creativity and stay passionate about their work.

7.2.3 Fish Ecology Division

The Fish Ecology Division (FE) is staffed by 60 scientists who conduct research in ocean estuaries and watersheds, both in freshwater and in Puget Sound. The research includes fish ocean survival and ecology, and ecosystem analysis using life-cycle modeling (e.g., Zabel et al. 2006, Scheuerell et al. 2009, Bond et al. 2019, Faulkner et al. 2019, Chasco et al. 2021, Crozier et al. 2021, Jorgensen et al. 2021). FE works closely with WCR on management issues, especially on watershed issues and on life-cycle modeling related to BiOps. FE coordinates well with CB and the Southwest Fisheries Science Center (SWFSC), but would like to coordinate more with AFSC.

Reimbursable funding plays an important role in the FE Division. Their juvenile salmon ocean surveys are funded by BPA, and their ocean survival and fish tagging efforts are funded by the U.S. Army Corps of Engineers (USACE)

[5] https://marinesurvivalproject.com/

and BPA. In addition, most of the watershed research has external funding. However, the drawbacks to reimbursable funding include the time and effort required for procuring the funding, and the stress it causes to employees who are concerned that they will lose their jobs if they don't get funding.

FE leadership's priorities for salmon funding and research are ocean science, watershed research, and life-cycle modeling related to salmon survival. There are some projects that could be removed if funding is further reduced, including eulachon research, activities in the Cedar River watershed, and tagging in the Lower Granite Dam trap. FE also suggests addressing potential life-cycle modeling and habitat research overlaps with CB Division. However, while some top-down coordination and consolidation may be needed, it should not hamper innovation and new ideas.

FE leadership encourages NMFS to develop centers of excellence, and NWFSC could be the center for ecotoxicology. FE recommends more cross-center collaboration, but suggests that the ocean modelers in SWFSC are probably enough for the California Current.

One FE team lead who was interviewed discussed the importance of ocean research. While the general thinking is that the ocean is a black box and there's nothing we can do about it, the evidence suggests that it is "overwhelmingly clear that the ocean is where we need to focus." The researcher referred to Crozier et al.'s recent (2021) paper on life-cycle modeling, and stated that every life stage and every management tool needs to be closely examined. Ecosystem models are needed, especially for salmon. Crozier is leading the effort to work with modelers to determine what's possible for models to accomplish, and what the best models would be for salmon management questions. At the present time, there are no ocean surveys in SWFSC, and NOAA is the only agency with jurisdiction in the ocean so no research on this topic is being conducted there. At NWFSC, 100% of the marine research work is funded by BPA, and it is a struggle to keep it funded. Also, the researchers are overwhelmed with heavy workloads. The team lead suggested that better integration would be beneficial for the Center.

7.2.4 Ongoing salmon science planning efforts

In February 2021, guided by the Vivid Description of the Future (VDoF) quoted above, NWFSC assembled a Protected Resources/Salmon Strategic Planning Team composed of salmon scientists. The goal is to develop a strategy that optimizes investments in science to maximize the impacts on management and the likelihood of species recovery. The plan aims to create a scalable strategy across different budget scenarios (low to high) and clearly articulate to policy- and decision-makers what NWFSC would do in different budget scenarios. The planning team is being asked to think about what the future of salmon science research would look like, and then develop the plan to meet the future needs and challenges.

7.2.5 West Coast Salmon Review

Also in February 2021, leadership from three west coast NMFS offices—NWFSC, SWFSC, and WCR—held a two-day review of ESA-listed Pacific salmon activities. Via presentations, leadership discussed the scope of salmon activities in the Pacific region; current challenges, gaps, and future priorities; budget and staff levels; and major research themes.

The goals of the review were to give the three NMFS offices a better understanding of each other's activities, and to search out areas of alignment. There were several tangible outcomes of the review:

- Of the $2.1 million in additional funding that the region received in FY 2021, $1.3 million will be distributed among the three NMFS offices to support program shortages; ~$600K in funding will support a new initiative. One potential project would be the climate resiliency initiative, tentatively called "Advancing Salmonid Reintroductions above Impassable Barriers." This collaborative initiative could inform reintroduction science in one or more geographic areas (e.g., the upper Willamette River tributaries, the Shasta River, or the Yuba River), and could also include efforts for communications/messaging/partnerships to advance reintroductions with constituents.
- Each office agreed that communication and outreach to Senate and House members on Capitol Hill needs to increase. This would include developing better messaging and increased education in the form of briefings. Participants agreed that leadership from each of the offices should engage on behalf of the region, specifically on salmon.
- NMFS leadership also agreed to continue to work on collective risk management, improved collaboration, increased efficiency, and leveraging resources across the region.

Follow-up actions to the review could include holding a three-day science-focused workshop that would give scientists from each of the five U.S. West Coast NMFS FMCs, as well as AFSC and the Alaska Regional Office, the opportunity to learn about each other's science and find ways to leverage resources, collaborate, and discuss priorities. A NOAA L·A·N·T·E·R·N position that could be created to do this work is described in Appendix A.

7.3 Salmon Science Discussion and Conclusion

2021 will be a good year for salmon science at NWFSC. The Protected Resources/Salmon Strategic Planning Team is a high priority for leadership, and a completed plan is expected by the end of the year. The plan will engage all NWFSC scientists involved in salmon research to determine the best ways that NWFSC can assist in the recovery of ESA-listed salmon species. This will likely result in changes to the NWFSC framework for salmon research.

According to the interviews, both scientists and leadership believe that improvements can be made within the cross-cutting salmon initiative. This will likely involve reorganizing and/or consolidating the existing salmon projects. Many scientists realize that in the face of flat budgets and increasing costs, the Center will need to focus on having fewer projects. However, the expectation is that these projects would be fully resourced. When considering which projects to eliminate, most staff members agree that there are "low-hanging fruit"—projects that are duplicative or overlapping, and certain unsupported PI-driven or primarily personal-interest projects. These should be ended, and NWFSC should focus its limited resources on the highest-priority projects.

In order to better focus on priority research areas, the Center could consider reorganizing the three divisions that partially conduct salmon research into one division that conducts all of the salmon research. While this potential division

would be large, it offers certain benefits in that the scientists could collaborate better, communicate more easily about their work and accomplishments, and pursue a unified agenda set by the new strategic plan. The division director could focus on setting the research vision and goals, effectively allocate resources, and ensure that the projects are well integrated and collaborative. To assist the director in managing this large division, we recommend hiring a deputy division director to oversee the administrative details, including budget, supervisory responsibilities, and human resources management. As part of this process, NWFSC would more broadly need to examine its organizational chart, and decide whether the current design is the most effective way to address salmon challenges.

Whether or not the Center decides to consolidate divisions, it will be important that NWFSC has one or more division directors or senior scientists who have more time to focus on integrating salmon across divisions and with NWFSC partners.

One issue that leaders of all salmon-related divisions agreed to is that the Center needs to make better use of the APP to establish priorities and allocate resources.

During and after the strategic planning effort, there will certainly be changes. This could be a great opportunity for the NWFSC salmon community to improve its effectiveness and efficiency, unite under a more narrowly defined vision, and focus its resources on the most pressing challenges to salmon recovery.

8. Planning and Budget Process Integration

The fourth emergent focus area focuses on the integration of the many management, planning, budgeting, and communications processes occurring at NWFSC. Over the last few years, several new and significant processes have been implemented to ensure that the Center is achieving its broad scientific priorities and fulfilling its many mandates. Mandates arise from diverse legislation, including the ESA and MSA, the Marine Mammal Protection Act (MMPA), and the National Environmental Policy Act (NEPA).

Key among these management, scientific communication, and prioritization processes are:

- The APP process, begun in 2016, which includes the Science Planning Process and the Project Planning Database.
- The Annual Guidance Memo (AGM), discussed in Section 8.1.
- The Center's vision documents, including the VDoF (NWFSC 2018) and its Implementation Plan (NWFSC 2019).
- A variety of topic-specific strategic plans—including climate, ecosystems, stock assessment, and human dimensions—from the NMFS Strategic Plan (NMFS 2019) to the NOAA Research and Development Plan (NOAA 2020a).

An additional challenge that has affected all of the above processes is COVID-19, which has delayed implementation of some of these processes, required new forms of communication with work colleagues, altered the ways work tasks can be completed, presented new telework challenges, and led to more-frequent, broadly attended all-hands meetings. Some employees have expressed that they enjoy the new way in which they communicate with colleagues, while others have expressed challenges.

In this section, we discuss how these various processes function, what we see as specific ways in which they could be improved, and how they complement each other.

8.1 NWFSC Scientific Plans and Planning Processes: From the VDoF to the AGM

From the staff perspective, this is a lot of change and many processes and plans to track and process. The Annual Guidance Memo provides an overview of how the Science Director (Kevin Werner) sees the different plans connecting to one another. Werner directly and repeatedly encourages staff to read it. It would not be unreasonable to more formally require that all staff read the AGM and participate in break-out discussions about it.

In most of our conversations with NWFSC staff, employees voiced trust and positive feelings about the direction of the Center. The regular online communication that has occurred during the COVID-19 pandemic has facilitated new relationships across divisions, and some employees have said that they feel more able to be open in the online setting. However, some employees also have ongoing questions about how to best gain new skills and become involved in high-priority

research areas. For example, climate work is occurring in various projects and groups, and the means to become involved, for people not currently in those groups, are not clear. Employees have appreciated the attention on skills development, but some have expressed ongoing uncertainty about how much effort to devote to pursuing new skills or training.

Recommendation: Experiment with different mandatory program-level and cross-program discussions of the AGM content. All staff should read the AGM and think about how it applies to them.

8.2 The Annual Project Prioritization (APP) Process

The APP process has been used for several years to rank and evaluate projects at the Center. All of the division directors, an external reviewer, the Science Director, and the Deputy Science Director evaluate the projects that are developed and frequently updated by the NWFSC Leadership Team.

In May 2020, an online APP Retreat was conducted by the Leadership Team (LT) and the external reviewer, Jason Link, the NMFS Senior Ecosystem Scientist. All of the members of the group scored all of the projects during meetings of the LT.

One of Link's comments was that the Center has a lot of small projects that could be combined into larger efforts that could perhaps be better assessed. One NWFSC program manager then questioned whether consolidating projects would really be useful if the projects become more complex. That said, they were actively working to consolidate projects. This topic has been an ongoing struggle, so there will necessarily be trade-offs in deciding the right project sizes.

One of the challenges of the APP process is how to use the process to make trade-offs between, for example, adding 5% more funding to a priority area, or using that money on a small, discrete, and potentially valuable stand-alone effort. This a crucial distinction—it may make more sense to spend a small amount of resources in a lower-priority area than to add additional resources to core Center work.

In interviews with NWFSC division directors, everyone expressed the desire to use the APP results to redirect resources, which has not been done to date. We recommend that NWFSC make it a priority to have the APP be effective, regularly utilized to allocate resources, and widely accepted by staff and leadership.

As part of this process, it is important to develop a systematic approach to re-evaluating the lowest-ranked projects. One approach would be to stop supporting the projects ranked in the bottom 10% of each PPA. If a division director felt that a certain project should be continued in spite of its low score, they could make an appeal to the LT with a justification for why. Alternatively, those projects could be put in a type of performance improvement plan. This would force processes requiring the PIs of such projects to explain why the projects are valuable to the Center. The PIs could be required to answer questions such as "What other benefits could the Center gain from this project under existing resources?" In addition, PIs could be asked if there are ways to capture most of the project benefits with a reduced budget. The LT could also make a plan for the project that would

involve sunsetting it, or otherwise minimize the management time spent considering the fate of the project. The alternative approach should be used in a way that doesn't undermine the original purpose of the APP, which is to reallocate resources from low- to high-priority projects.

8.3 Budget Management

Among the challenges of this project have been our attempts to understand what data exist, to put them in a usable, understandable format, and to see the data that NWFSC staff use as part of management, planning, and budget reconciliation.

As discussed in Section 3 of this report, the major challenges of balancing the budget include allocating funds to PPA, the high burden rate for some PPAs and divisions, and the lack of discretionary funds to address unexpected costs. Having a highly centralized budget tracking system would allow the Center to better anticipate coming budget challenges, adjust to them, and plan future spending in light of long-term patterns that may not be well understood across Center leadership.

Perhaps this is not any more complicated than a business that has diverse revenue streams, but the process of tracking funds through the year is always challenging. The Center's Deputy Science Director, OMI staff, and division coordinators all work hard to balance the needs to pay staff and all expenses, and to expend all funds by the end of the fiscal year. Any steps that could be taken to resolve uncertainties earlier would be valuable.

8.4 Create a Home for NMFS and Center Management Analyses

One of the biggest challenges of this project was identifying what resources of information exist, never knowing if someone who had worked at the Center, NMFS Headquarters, the West Coast Region, or elsewhere had conducted an analysis relevant to some of the issues that we have been trying to understand. We think it would be very valuable to provide an intranet/internet home for this and similar reports done at NWFSC and elsewhere about scientific management and planning. We need to develop and make widely known a unique and commonly identified location where management analyses, reports, and data are stored. Ideally there would be an OST staff member who would be able to direct interested NMFS staff to these references and share new studies with interested parties. Over the years, there have been a variety of analyses done, but other interested parties have not always been aware of the work (e.g., David Detlor's OMI comparison while he was at NWFSC). Because these are often unpublished reports, the information gets lost.

9. Climate Change Research

This emergent focus area was added relatively recently as it became clear in discussions with NOAA leadership that climate-related research will be given greater priority in coming years than in the past. The Biden Administration has fostered a new recognition of the widespread impacts of climate change, releasing two Executive Orders (EO 13990 and EO 14008) related to climate in its first week in office.[6] NOAA and NMFS will be central actors in the government's increased scientific support of climate research, and NWFSC will have new opportunities as a result. Examples of new developments include:

- Jane Lubchenco, former NOAA Administrator, is now at the White House's Office of Science and Technology Policy (OSTP). In the past, Lubchenco was a strong advocate for a National Climate Service, and conversations are currently occurring at NMFS HQ about the feasibility of reinitiating this effort.
- NOAA's Office of Oceanic and Atmospheric Research (OAR) expects significant additional resources related to climate, some of which will go to important NWFSC partners.
- The NOAA Climate and Fisheries Initiative (CFI; NMFS 2021) is expected to provide considerable additional resources to NMFS science centers beginning in FY 2022 or 2023.

9.1 Climate Considerations at NWFSC

NWFSC will face both challenges and opportunities associated with climate change. The Center should examine the role of its climate research team and update the Western Regional Action Plan (WRAP; NWFSC and SWFSC 2016). The Center's climate research team, led by Rich Zabel and Lisa Crozier of FE Division, could create a similar plan to the one being created for protected species/salmon. The team could identify climate-related priorities, determine staff who have relevant interests and skills, and consider developing project proposals to prepare in advance for the opportunities that may arise. The proposals should consider multiple levels of out-year planning, starting with a smaller initiative but subsequently increasing each year to develop a larger long-term program in climate change research. Among many topics, the projects could include life-cycle modeling and habitat-related climate work, recommended in both the five-year review and during interviews, and integrate marine climate modeling efforts.

An interview with Eric Shott, who leads the West Coast Region Climate Team ("WCR team"), revealed that he participates in the Center's WRAP effort and includes Center scientists in the WCR team, resulting in an important partnership on climate. The WCR team is currently distilling its list of climate priorities, and will include it in the upcoming revision of the WRAP. The WCR team focuses on regional priorities, e.g., producing internal guidance on how to incorporate climate into ESA Section 7 analyses, or assisting the management of trust resources. It also keeps everyone connected on climate activities and organizes and prioritizes needs. While the WCR team hasn't finalized its priorities, it values public–private partnerships and hopes increasing awareness of climate change will increase opportunities to address restoration and recovery needs. Climate scenario planning will be an important tool in this effort.

[6] https://www.federalregister.gov/presidential-documents/executive-orders/joe-biden/2021

At NWFSC, a number of scientists are involved in climate-related research, although it is not typically their primary focus. Though this emerging focus area was identified late in the Rightsizing Project, we did interview several NWFSC climate researchers. In one interview, a scientist expressed that he would like to see the Center build more climate science capacity. While all Center programs are directed to incorporate climate into their research, this scientist reports feeling that employees often lack specific guidance on how to do it. He suggests focusing on climate futures, or using climate forecasts from General Circulation Model (GCM; NOAA 2007) suites to map environmental conditions. The researcher suggests that the Center should build more predictive modeling tools to play future "games" that will help develop a combination of actions and tools for co-management communities. As previously stated, relationships between environmental conditions and biological conditions are evolving, so scientists will have to attempt to build tools that are more robust to uncertainty and promote action-based science strategies that reflect the urgency of the crisis.

At the NMFS Office of Habitat Conservation (OHC), staff are managing climate impacts in traditional and new ways. Green infrastructure, floodplains management, rolling easements, and the search for heat-tolerant species of salmon and coral are all tools to address climate impacts. In addition, OHC is participating in a human dimensions working group to have economists look at the value of habitat, and to use socioconomics to be more proactive in achieving restoration. As part of this effort, OHC is using conservation finance as a new and innovative tool to promote habitat conservation.

While there may be many new opportunities, there will also be considerable challenges in coordinating the development and execution of new projects. The cross-cutting requirements for climate work mean that there will be significant additional management and coordination needs among NWFSC divisions and with NMFS, NOAA, and external stakeholders who are interested in or already are conducting climate research. The Center should recognize the potential for increasing work demands and it will be Important to balance novel climate-related scientific priorities with existing research areas impacted by climate. The Center should also realize the stress that could be added to already overstretched staff with a major new initiative, and consider hiring staff with part of their responsibilities focused on these management and coordination needs. AFSC's experience with a large marine climate research program indicates that coordination requires a large time commitment. Additional coordination support would be very valuable to the success of climate work and would provide time for NWFSC scientists to focus on identifying and executing the Center's climate-related priorities.

10. Rightsizing Recommendations

A primary focus of this project has been to consider ways to improve the functioning of the Northwest Fisheries Science Center. In this section, we summarize the key recommendations made throughout the report. More detail and discussion are offered on many of the recommendations in relevant sections of the report, and in Section 11.

Budget

- NWFSC should consider setting a targeted burden rate, and work to have more discretionary funds that can address the inevitable budget surprises wherever they occur. WCR uses a burden rate target of 85%, although the rate may vary significantly by organizational unit. This is not directly comparable to NWFSC because of the latter's use of long-term reimbursable funds that directly pay for federal salaries, and "temp" funds that are a standard portion of the NWFSC budget. However, identifying ways to allow more money to move across divisions and PPAs is a central element of making the smaller Center able to respond to budget challenges.
- The Center should create an evolving budget "Priority data needs" list that makes the OMI Director (or a designee) accountable for providing the data needed for the Leadership Team to make core decisions. NWFSC should continue to invest in and improve its centralized budget management tools.

Reimbursables

- Scientists and other staff should pursue new reimbursable projects only if they complement the Center's core activities and support innovative, cutting-edge research.
- Supervisors should evaluate new project proposals based on a set of criteria similar to the APP process, ensuring that projects are focused on core NWFSC scientific priorities, based on the NOAA and NMFS Strategic Plans.
- The NWFSC Science Director or Deputy Science Director should make the final decision to approve or decline projects.
- The division director overseeing a project should inform the LT of any significant changes in the project as it progresses—e.g., increased or decreased funding level, longer or shorter duration, delays in deliverables, etc.
- Scientists, administrative staff, and Center leadership should strive to specify the period of performance in a reimbursable agreement to provide an adequate time buffer for possible standard delays. Extending agreements under normal circumstances imposes a large and unnecessary administrative burden on the Deputy Science Diretor and others.
- We recommend that the Center conducts a brief review of the NWFSC Reimbursable Funding Strategy and its implementation in 2023.

Transitions

- NWFSC leadership at all levels should communicate the importance and benefits of cross-training and transitioning to mission-critical projects to promote agility in the organization. The Communications Program should work with leadership on messaging.
- When initiating a transition, supervisors should work with transitioning employees to create a transition plan that outlines the steps, timetable, and expectations for the transition. Honesty and trust should constantly be reinforced to the employee.
- Supervisors can also create a transition team, consisting of staff from the new and old divisions or programs, to help the employee with the transition. The team would work to support the employee's training, mentoring, and other needs.
- Leadership should be consistent in its messaging before, during, and after any transitions.

Salmon

In 2021, NWFSC's Protected Resources/ Salmon Strategic Planning Team, led by scientists, is developing a strategy to maximize the Center's impact on salmonid management and the likelihood of species recovery. We recommend that the planning team consider:

- Using the five-year review from 2015 (NWFSC 2015) as a starting point for the strategic planning effort. It is unclear if the recommendations made in the review were implemented, but in their final report, the panelists from the review included actions and justifications that should be revisited.
- Ending support for PI-driven projects that are not aligned with NMFS and NOAA scientific priorities. Also, any projects not listed in the APP should be identified and included or ended. For example:
    - Certain aspects of ocean acidification research currently conducted by EFS.
    - In FE, projects relating to eulachon research, the Cedar River watershed, certain dam passage and estuary projects, and tagging at the Lower Granite Dam trap.
- Consolidating the organization of salmon research efforts into one division. Given the large investment in salmon research activities, more sustained strategic attention to this topic would be very valuable. In doing this, NWFSC would be implementing one of the recommendations from the five-year review: better integration. Consolidation would result in improved salmon science planning and coordination, and facilitate better implementation of the strategic planning effort. It would also allow some savings from combining small programs, which will be essential if the number of salmon-focused staff is further reduced in the future.
- If NWFSC decides to consolidate salmon activities under one division, we recommend that the division director focus on high-level activities such as setting the research vision and goals, effectively allocating resources, and ensuring that the projects are well integrated and collaborative. To assist the director, we recommend hiring a deputy division director to oversee

the administrative details, including budget, supervisory responsibilities, and HR management. This separation of duties would allow for the effective management of a large division. Regardless of whether consolidation occurs, the Center needs to give its salmon leaders—Division Directors and Senior Scientists—more time to focus on coordinating research across the Center and with partner organizations, to better achieve salmon recovery goals.
- Funding fewer salmon activities, but fully funding them. This recommendation was proposed by J. Link, NMFS's Senior Scientist for Ecosystem-Based Management, at the 2020 NWFSC APP Retreat. NWFSC should consider that most salmon scientists are stressed due to lack of resources, and most divisions are spread thinly across multiple efforts. NWFSC could choose to fully support the activities that are most critical to management support and ESA-listed species recovery, or those in which NWFSC has unique expertise (e.g., genetics, or juveniles in marine environments).
- Providing more resources for climate change, habitat, and life-cycle modeling activities, which could be combined to lay a strategic path for the future. This was recommended by the five-year Salmon Review panel.
- Conducting additional work in the ocean environment, based on interviews and the five-year salmon review panel (cf. NWFSC 2015, p. 13: "The conclusion that ocean survival has a greater effect on extinction risk than freshwater survival hardly seems surprising to me given the typical relative magnitudes of survival in the two environments"). This is an area where only NOAA is working, so NOAA has all the expertise and is recognized in the region as the only source of information and data on this topic.
- Creating a salmon website which can be reached from the NMFS website. The salmon website could contain the salmon research history of NWFSC, links to WCR and relevant legislation and management activities, press releases, research in each division, updates on salmon strategic planning, links to partners' salmon activities (BPA, USACE, the U.S. Fish and Wildlife Service, etc.). There is currently no centralized area for information on salmon science in the Pacific Northwest, so this would be a valuable resource for the region.

Planning and Process Coordination, Integration, Communication

- Building on the AGM, clearly articulate how the various NOAA, NMFS, and NWFSC scientific priorities are related to one another. Experiment with different mandatory program-level and cross-program discussions of the AGM content. All staff should read the AGM and think about how it applies to them.
- Communicatie to staff, both formally and informally, the necessity for the Center's scientific priorities to evolve with changing management objectives and budgets.
- Focus additional attention on relationships with BPA and USACE leadership to support the highest-priority research.
- Continue to use diverse methods of outreach/communication to staff.
- Provide clarity on why certain projects are not priorities. Some employees feel that their work is focused on a clear priority, and yet is not highly ranked.
- Learn from COVID-19 communications.

Climate research

- Employ the NWFSC Climate Research Planning Team to update the WRAP and initiate a climate science strategy similar to the Protected Resources/Salmon Strategic Planning Team. Be proactive in developing research plans to take advantage of the Biden Administration's interest in this research area.
- Balance the need to cover multiple research priorities in the face of declining stable budgets with the importance of new climate research areas.
- Recognize that coordinating climate research activities will be an important and significant task, and devote adequate resources to the coordination.

Planning and Budget Process Integration

- Make it a priority to have the APP be used in the allocation of budget resources.
- Address bias against new projects in the APP to encourage innovation.
- Use new money, savings in operations, and contractor costs to support the transition of FTEs to priority projects.
- Adjust the APP process to allow better "marginal thinking" across projects. For example, while stock assessment may be an extremely high priority, at some point additional resources could be better used elsewhere. The APP process needs to better steer the balance of resources, while recognizing the relative priorities of different work.
- Develop a systematic approach to re-evaluating the lowest-ranked projects. One approach would be to stop supporting projects ranked in the bottom 10% of each PPA. Alternatively, those projects could be put on a type of performance improvement plan. This would force processes such as, "provide budgets that are 50% or 75% of current levels," or require explanations of how such projects can provide additional benefits. The alternative approach should be used in a way that doesn't undermine the original purpose of the APP, which is to reallocate resources from low- to high-priority projects.
- Provide an intranet/internet home for this and similar reports done at NWFSC and elsewhere about management. Provide a unique and commonly identified location where management analyses, reports, and data are stored. Over the years, there have been a variety of analyses done, but other interested parties have not been aware of the work (e.g., NWFSC's OMI comparisons).

Management

- NWFSC may want to consider using conduct, in addition to performance, to evaluate staff members. While traditional metrics embedded in performance reviews have long been used to rate a staff member's work performance, in many cases long-term conduct issues have not been addressed and these issues often grow over time, causing management challenges over years and decades.
- To ensure the integration of science work with management needs, WCR conducted a study to analyze the strategic planning processes of each of the five NMFS offices on the U.S. West

Coast (NOAA 2015b). The resulting report recommended that leadership create a Steering Committee to annually coordinate priority-setting meetings for NMFS leadership across the Pacific Region. The meetings worked to align regional priorities and resource allocation in the strategic and budget planning processes.

- NWFSC has recognized the importance of congressional engagement, and should develop a proactive strategy to interact with congressional leadership at both the local and national level. The Center should expand its congressional engagement efforts by employing a variety of mechanisms, including outreach events, ship tours, facilities tours, visits to congressional offices, congressional roundtables, etc.
- Consider the evolving burden on supervisors and whether there are ways to reduce this burden.
- Assess the role, responsibilities, and appropriate group size of supervisors at NWFSC. When groups are too small, consider how best to combine them. Include a provision in management policy that supervisors with fewer than three employees should not be supervisors, and then enforce this requirement.
- Beyond NWFSC, there should be open and ongoing conversations about how each Center can learn from other Centers' experiences. Centers should consider creating "Centers of excellence" when there is a broad need for a type of research, but where a) aggregating the work in one Center would be most effective, or b) having on average less than one researcher per Center focused on a task may be sufficient for the nation's needs.

11. Discussion, Conclusions, and Future Work

In general, we feel that the Northwest Fisheries Science Center is a dynamic organization that recognizes its financial challenges and has implemented planning, tracking, and communication systems to adapt to an evolving scientific and fiscal environment. Leadership has made difficult staffing and other funding choices to stay within the Center's budget.

Continuing to develop and improve centralized budget and planning processes will enable the Center to better address budget challenges that arise within fiscal years and help to better plan the budget over time. The Center needs a larger amount of money that is not obligated to a PPA or fixed cost so that it can continue to be a dynamic organization that adapts to evolving scientific priorities and challenges.

It is important for us to add a number of caveats on data, process, results, and recommendations. Our interview-based approach is not the same as a census of employees, but provides broad and deep insight into the leadership structure using select inputs from others. We had discussions with a number of people to try to understand both the current experience of employees and the institutional history of the Center, but undoubtedly gaps remain.

One initial ambition of the project was to understand what stakeholders need from the Center, to help evaluate what the Center's research priorities should be. We quickly realized that this was beyond the scope of the project, so it was not a significant focus. In Appendix A, we propose a NOAA L·A·N·T·E·R·N term opportunity for a NOAA employee to explore this question at NWFSC and/or other NMFS science centers.

One conclusion from our work was that there are very different levels of engagement with NWFSC stakeholders. NWFSC leadership is regularly and highly engaged with the West Coast Region, the Pacific Fishery Management Council, other science centers, and the NMFS Office of Science and Technology. Additionally, Science Director Kevin Werner's previous experience at the NWS and former FRAM Division Director Michelle McClure's current role as Director of the Pacific Marine Environmental Laboratory have significantly expanded NWFSC's NOAA relationships. University of Washington research relationships are also very strong.

On the other hand, NWFSC contacts with the U.S. Army Corps of Engineers and the Bonneville Power Administration (BPA), both important partners for reimbursable-funded research, are not as regular. To some degree this is a function of the nature of these different relationships and the need for more regular contact with some stakeholders, but—given the desire to ensure that NWFSC research focuses on its core scientific priorities—more attention could be given to these relationships to better ensure that the work funded through these partnerships has the greatest scientific value possible.

The Rightsizing Project was met with broad interest when it was presented to the NMFS Science Board. Subsequent conversations with science directors have indicated that all centers are engaged in self-reflection about how best to match budgets and scientific priorities. Beyond NWFSC, there should be open and ongoing conversations about how

each center can learn from other centers' experiences. Centers should consider establishing centers of excellence when there is a broad need for a type of research but where one person may be adequate for the nation's needs in a particular research area.

NWFSC is on track to establishing a process that identifies its scientific priorities and allocates resources and staff to the highest-priority areas. Changes are challenging, and some changes will significantly impact the careers of scientists who are experts in areas that the Center may no longer feel are high-priority. Leadership should continue its robust communication efforts, track how changes have happened so that staff can understand how and why decisions are being made, and continue to integrate its planning, budget, and tracking processes.

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Appendix A: Potential L·A·N·T·E·R·N Opportunities

The new NOAA L·A·N·T·E·R·N Program[1] provides the opportunity for NWFSC now or in the coming years to create project opportunities to continue and extend the work that has been conducted in the Rightsizing Project. Below are several suggestions for possible L·A·N·T·E·R·N (or NWFSC staff) projects that would be valuable to NWFSC and NMFS.

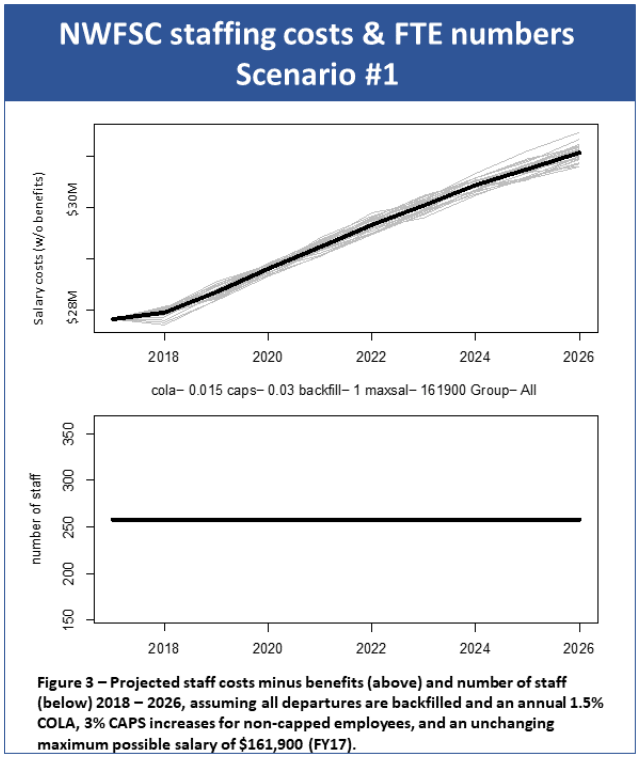

Figure 3 – Projected staff costs minus benefits (above) and number of staff (below) 2018 – 2026, assuming all departures are backfilled and an annual 1.5% COLA, 3% CAPS increases for non-capped employees, and an unchanging maximum possible salary of $161,900 (FY17).

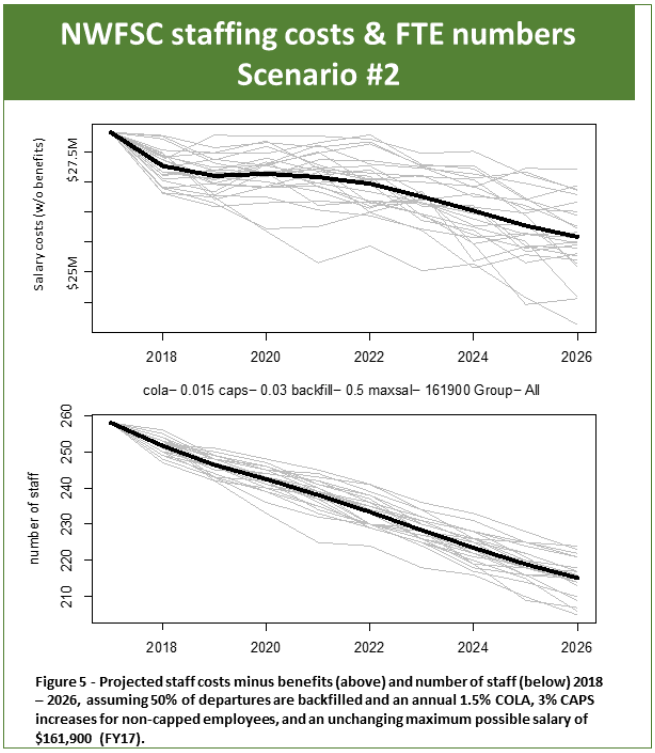

Figure 5 - Projected staff costs minus benefits (above) and number of staff (below) 2018 – 2026, assuming 50% of departures are backfilled and an annual 1.5% COLA, 3% CAPS increases for non-capped employees, and an unchanging maximum possible salary of $161,900 (FY17).

Figure 8. Illustrative example of two NWFSC staff scenarios, comparing the costs of 100% (left) versus 50% (right) staff backfill. Source: M. Ford, NMFS/NWFSC.

[1] https://sites.google.com/noaa.gov/lantern/home

Project 1 Develop a Tool to Predict Retirements Across NMFS Science Centers

All agencies within the Department of Commerce face impending retirements in the coming years, but science centers face specific conditions that will impact their financial outlook and those of their divisions.

At NWFSC and other centers, division directors have different methods for analyzing the trajectory of these retirements. In some cases, division directors know that certain staff have plans to retire at certain points and can specifically respond to those probable scenarios. Understanding how this functions across divisions and time, however, would provide better estimates for labor costs over the next decade. The comparison of two scenarios in Figure 8 illustrates the potentially large impact each would have. This example is intended to be illustrative, and the project should explore a range of possibilities.

Estimated time needed: 120 days.

The goal of the project would be to develop a tool that could be used across divisions at NWFSC—and, if successful, across all NMFS science centers—to predict the number and timing of upcoming retirements.

Core activities:

- Interview HR staff about current DOC/NOAA/NMFS retirement estimations.
- Organize available data from NMFS Headquarters and science centers.
- Develop and conduct a short survey of all division directors of their existing processes.
- Develop a spreadsheet or R model to examine retirement rates over the available timeframe.
- Develop a tool that will allow managers to customize assumptions, estimated retirements, and related costs.
- Test and implement the tool.
- Write a report.

Project 2 Compare and Evaluate APP Processes Across NMFS Science Centers

The APP process is done differently across NMFS science centers, but is becoming the primary tool for prioritizing project work. Given the importance of the tool and the significant commitment of leadership, more collective attention on best practices is warranted. The APP process is evolving differently at each center; a comparative study offers considerable benefits.

Estimated time needed: 90 days.

The goal of the project would be conduct a comparative study of the science centers to compare each center's APP planning process, identify common and unique challenges, and recommend best practices.

Core activities:

- Interview staff and examine documents on process and outcomes.
- Convene an ad hoc workgroup with a member from each center to ask common questions, circulate reports, etc.
- Conduct additional interviews.
- Write a short report that summarizes the features for each of the processes.
- Incorporate input from the work group and the Science Board.
- At the end of the detail, NWFSC could assign a staff member to continue monitoring the successes and challenges of the APP process. An annual comparison of how the APP process is evolving would be valuable.

Project 3 Examine Stakeholder Interaction Processes Across Science Centers

NWFSC engages many partners to conduct research to achieve its mission. These partners include federal and state agencies, tribes, NGOs, academia, industry, and communities. To date, there has been no formalized attempt to elicit feedback from these partners about the nature of the partnership and how it could be improved. While the Leadership Team has regular contact with certain partners within their community, other partners—such as the U.S. Army Corps of Engineers and the Bonneville Power Administration (BPA), both important partners for reimbursable-funded research—are more distantly connected. NWFSC's research focuses on its core scientific priorities, so more attention to these relationships would better ensure that the work conducted through these partnerships has the greatest scientific value possible.

Estimated time needed: 90 days.

The goal of the project would be to collect data on and to analyze NWFSC's partnerships, and present the Leadership Team with a report, a summary of the surveys and interviews conducted, and recommendations on how to improve these partnerships.

Core activities:

- Work with NWFSC staff to identify partner organizations and points of contact within each. This could be done through a survey, or via individual interviews.
- Compile a list of questions that would help improve understanding of how the relationships are functioning. For example:
  - How long have you been working with NWFSC?
  - What types of work do you conduct with NWFSC?
  - Do you have a formal (e.g., MOU, reimbursable agreement) or informal arrangement with NWFSC?
  - What is your funding arrangement with NWFSC?
  - What aspects of the relationship are working well, and conversely, what aspects are not working well?
  - How can the partnership be improved?
  - How do you see the partnership progressing in the short and long term?
  - Do you have any lessons learned to share?
- Conduct an analysis of the data and draft a report that provides recommendations on how to strengthen these partnerships.

Project 4 Coordinate a Three-Day West Coast Region Salmon Science Workshop

The salmon world on the U.S. West Coast is a complex web of organizations, science, and management. Over 100 researchers at NWFSC and SWFSC are engaged in salmon research, and WCR has many additional staff engaged in salmon management. It is difficult to stay up-to-date with the latest science discoveries and management activities even just within NMFS.

Estimated time needed: 120 days.

The goal of the project would be to coordinate a three-day salmon science workshop that gives the salmon scientists from three science centers (AFSC, NWFSC, SWFSC, and other U.S. West Coast FMCs involved in salmon research and management) an opportunity to present their work to the entire NMFS salmon community. WCR would also be fully engaged as a partner to help ensure that management needs are included in the discussions. The data collected would be used to understand the scope of salmon work in the region, and help scientists leverage resources, develop new partnerships, and identify areas of overlap.

Core activities:

- Identify the names of all of the personnel working on salmon issues in NOAA FMCs (NWFSC, SWFSC, WCR, OLE, OHC, AFSC, AKRO).
- Schedule and coordinate the logistics for a three-day science workshop.
- Develop draft template presentations for the researchers to use, to ensure key questions are addressed (scope of work, funding level, management connection, geographical scope, partnerships, etc.).
- From the presentations and subsequent discussions, identify areas of overlap, potential leveraging, and resource sharing.
- Attempt to define the highest-value salmon-related research activities for the Center to conduct.
- Identify activities which do/do not address management needs.

Appendix B: Recommended Reading

Topic Area 1 Successful Research Centers

We conducted a literature review to investigate the current literature about what makes science centers successful. In general, we found less research than we expected that would help guide what makes research centers similar to NWFSC effective.

1. **Siota, J. 2019. Technology Transfer Commercializing Discoveries at Research Centers Through Linked Innovation.** IESE Business School, University of Navarra, Pamplona, Spain. Available: media.iese.edu/research/pdfs/ST-0519-E.pdf (June 2021).

The model presented in this study is targeted at turning research into commercialized products. In the case of the NMFS science centers, the target would be effective usage and/or implementation of the research by the regional offices. The paper examines the reasons for the breakdown in linkages between the research and the product, and how to resolve it.

They discuss several failures in linkages: nonholistic prioritization, lack of knowledge sharing, lack of academic experience, and lack of nonacademic experience. The tactics they recommend for solving the linkage problems include hiring an advisory board and using professional recruitment.

When looking to transform organizations, the four causes of failure are: ignorance of market (client) needs, lack of vision, teams lacking academic or business expertise, and uncoachable researchers. An example of a transformed organization is one in which teams have mixed Ph.D. and MBA skills, as well as gender, ethnic, and geographic diversity. The authors also suggest including the word "coachable" in the recruitment and performance plans of researchers.

2. **Bozeman, B., and P. C. Boardman. 2003. Managing the New Multipurpose, Multidiscipline University Research Centers: Institutional Innovation in the Academic Community.** IBM Center for the Business of Government, Arlington, Virginia. Available: www.businessofgovernment.org/sites/default/files/UniversityResearchCenter.pdf (June 2021).

This report presents and expands on 12 recommendations for center directors and university administrators, several of which may be useful to NWFSC. Examples include: setting aside a small percentage of Center funds as seed grant money for underdeveloped yet promising research proposals, discouraging "shell collaborators" who consume vital resources with limited return, and hiring a research management generalist to facilitate interdisciplinary research activity.

3. **Pozen, R., and H. Kline. 2011. Defining Success for Translational Research Organizations.** Science Translational Medicine 3(94):94cm20. Available: www.science.org/doi/abs/10.1126/scitranslmed.3002085 (June 2021).

Research entities need a flexible framework for performance assessment that tracks the organization's progress, incentivizes activities that breed success, and aligns the organization with its goals. This article presents a framework that assesses the performance of Translational Research Organizations (TROs: organizations created in the medical field to "translate" scientific discoveries into improved clinical practices) along seven main dimensions: funding, talent, creation, validation, dissemination, external uptake, and collaboration.

Applying this framework, stakeholders within a TRO should engage in a process of collective goal setting and prioritization of these goals in light of the TRO's financial resources and scientific expertise. Then, they should develop key performance indicators and metrics by which to track progress toward the goals.

4. **Borchardt, J. K. Using Research Metrics Helps Get More Bang for Your R&D Buck.** Lab Manager 2(4). Available: www.labmanager.com/business-management/using-research-metrics-helps-get-more-bang-for-your-r-d-buck-21150 (June 2021).

R&D performance metrics must be a) aligned with the strategic objectives of both the parent organization and the customer, b) communicated to all members of the R&D organization so that they understand them well, and c) be connected to the personal objectives of the researchers. The metrics methodology must be effectively communicated as well. Performance metrics should be measured as value-added contributions at the individual, departmental, and enterprise levels.

Three general themes emerge: 1) simple metrics are useful even if they don't measure all of the project activities; 2) one should be careful of having too many metrics and turning metrics into an overly bureaucratic exercise; and 3) timely updates of metrics are essential if the metrics are to drive project planning and progress.

5. **Turpin, T., and A. Deville. 1995. Occupational roles and expectations of research scientists and research managers in scientific research institutions.** R&D Management 25(2):141–157. DOI: 10.1111/j.1467-9310.1995.tb00907.x

This article focuses on the changing occupational roles of research scientists and research managers in Australia's CSIRO (Commonwealth Scientific and Industrial Research Organisation) throughout its history, and looks at the relationships between science and science management, and between science management and commercial management (including business entrepreneurs). The paper discusses the dual career path—scientist vs. research manager—at CSIRO, one of the world's largest multidisciplinary research organizations. It also introduces the idea of the hybrid path, which allows individuals to move more smoothly between these two roles. The future goal for organizational development is to create "a culture of occupational diversity" that is broader than the traditional dual-career perspective.

Core qualities deemed important in research managers include: the ability to interact with people, open-mindedness, the ability to empathize with researchers, and a science background. Secondary qualities include: leadership and decision-making skills, administrative capabilities, and networks with industry. For scientists, management skills, flexibility, the capacity for multidisciplinary work, team and people skills, and the ability to work on multiple short term projects are all important. These attributes have changed over time, as scientists have realized the need to operate differently under managed science.

The article also analyzes the criteria scientists and research managers use to determine which research projects to pursue, versus which criteria are being used to determine internal projects. The results indicate a high level of convergence between both groups. CSIRO has moved toward an R&D strategy that is increasingly controlled by market forces, and therefore requires balanced management. Science managers can provide a bridge between the potentially conflicting areas of science and commercial management.

6. **Duhigg, C. 2016. What Google Learned From Its Quest to Build the Perfect Team.** New York Times Magazine (February 25). Available: www.nytimes.com/2016/02/28/magazine/what-google-learned-from-its-quest-to-build-the-perfect-team.html (June 2021).

In 2012, Google created Project Aristotle to study why some teams are successful and others not. They studied various teams within Google, but struggled to find patterns. Eventually, Project Aristotle researchers concluded that understanding and influencing group norms were essential to improving Google's teams. Two items were key to success. First, on the most effective teams, members spoke in roughly the same proportion, a phenomenon the researchers referred to as ''equality in distribution of conversational turn-taking.'' Second, these teams all had high ''average social sensitivity''—i.e., they were skilled at intuiting how others felt based on their tone of voice, their expressions, and other nonverbal cues. Successful teams held a shared belief that the team was safe for interpersonal risk-taking. Establishing psychological safety was difficult to implement, but Google examined the data and found that conversational back-and-forth and empathy were the best ways to create it. Project Aristotle has encouraged emotional conversations and discussions of norms among people who might otherwise be uncomfortable talking about how they feel.

7. **re:Work (no date). Guide: Understand team effectiveness.** Google re:Work website. Available: rework.withgoogle.com/guides/understanding-team-effectiveness/steps/introduction/ (June 2021).

A successful team should provide psychological safety, dependability, structure, clarity, and meaning. Smaller teams (ten people or fewer) tend to be more successful, and experience a better work–life balance, less conflict, better communication, more cohesion, and more organized citizenship behaviors. To foster team psychological safety, individuals should frame the work as a learning problem, not an execution problem. Individuals should acknowledge their own fallibility, and model curiosity by asking lots of questions.

In successful teams, leaders must:
1) establish a common vocabulary (i.e., define the team behaviors and norms they want in their organization); 2) create a forum to discuss team dynamics and allow for teams to talk about subtle issues in safe, constructive ways; and 3) commit leaders to reinforcing and improving the workplace.

Topic Area 2 Transitioning Employees

This list presents publications that address the challenges of moving employees to a new role within the same organization, and offer ways to smooth the transition. Many describe transition plans, and how they can help facilitate the change. The descriptions here are shorter than in Topic Area 1, given the central role of that topic in the project.

1. **Cullimore, R. 2020. How to Properly Transition Your Employee Into a New Role.** Manila Recruitment, Manila, Philippines. Available: manilarecruitment.com/manila-recruitment-articles-advice/how-to-properly-transition-employee-new-role/ (June 2021).

The article outlines the seven steps to a successful transition. It suggests a 90-day transition period, and recommends guidance, support, and proper planning throughout.

2. **Green, R. 2019. Strategies for Successful Employee Transition.** Business News Daily (November 19). Available: www.businessnewsdaily.com/8121-employee-job-transition.html (June 2021).

This article presents business strategies for an internal employee transition, including how to communicate with the employee and team to get the most out of the transition.

3. **Sementilli, A. J. (no date) Transitioning Employees Into New Positions.** TeamPeople website. Available: www.teampeople.tv/workforce-solutions-blog/transitioning-employees-new-positions (June 2021).

This short article offers tips on how employers can smooth the transition process.

4. **Young Entrepreneur Council. 2019. Facilitate a Smooth Internal Transition for Your Employee With These 7 Tips.** Inc. (March 19). Available: www.inc.com/young-entrepreneur-council/7-ways-to-help-your-star-employee-transfer-to-a-new-department.html (June 2021).

This article suggests the creation of a transition team to help facilitate transition.

5. **Miksen, C. (no date) How to Tell an Employee of a Change in Position.** Chron. Available: smallbusiness.chron.com/tell-employee-change-position-21665.html (June 2021).

This article explains how the conversation should proceed as supervisors inform employees that they are being transitioned.

6. **Lavoie, A. 2015. How You Can Get Employees Rolling in Their New Roles.** TLNT: Talent Management & HR (May 12). Available: www.tlnt.com/how-to-get-employees-rolling-in-their-new-roles/ (June 2021).

This article emphasizes onboarding protocols to ease the transition, such as cross-training, mentorships, socializing employees, and effective two-way feedback.

Topic Area 3 Leading Change

Leading change is a movement within the business community that addresses how to make successful organization-level changes. The many challenges include getting buy-in from leadership and staff, operating effectively during transition periods, and maintaining morale. These publications are relevant to leading NWFSC through transitions and changes in the organization's structure and focus. Readers interested in more information about this topic may find the following references useful.

1. **Kotter, J. P. 2012. Leading Change, With a New Preface.** Harvard Business School Press, Boston, Massachusetts.

This a classic work, originally published in 1996, that focuses on challenges and strategies for leaders to achieve change in their organizations. Key strategies include:

1. Create a sense of urgency.
2. Build a guiding coalition.
3. Form a strategic vision and initiatives.
4. Enlist a volunteer army.

5. Enable action by removing barriers.
6. Generate short-term wins.
7. Sustain acceleration.
8. Institute change.

2. **Kotter, J. 1995. Change: Why Transformation Efforts Fail.** Harvard Business Review (May–June). Available: hbr.org/1995/05/leading-change-why-transformation-efforts-fail-2 (August 2020).

Much of the book *Leading Change* is also summarized in this Harvard Business Review article by the same author, which identifies eight key mistakes in transitions:

Error 1. Not establishing a great enough sense of urgency.
Error 2. Not creating a powerful enough guiding coalition.
Error 3. Lacking a vision.
Error 4. Undercommunicating the vision by a factor of ten.
Error 5. Not removing obstacles to the new vision.
Error 6. Not systematically planning for and creating short-term wins.
Error 7. Declaring victory too soon.
Error 8. Not anchoring changes in the (agency's) culture.

3. **Leading Effectively. 2020. 5 Questions to Ask Before You Hire a Change Consultant.** Center for Creative Leadership (March 14). Available: www.ccl.org/articles/leading-effectively-articles/5-questions-to-ask-before-you-hire-a-change-consultant/ (January 2021).

This article suggests there are five key questions to consider when considering major organizational change:

1. What's changing?
2. What's going on with the senior team?
3. Are we struggling to manage or struggling to lead?
4. Is who we are getting in the way of what we need to do?
5. What kind of help do we want?

4. **Sturt, D., and T. Nordstrom. 2016. 6 Dos And Don'ts Of Leading Through Change.** Forbes (May). Available: www.forbes.com/sites/davidsturt/2016/05/13/6-dos-and-donts-of-leading-through-change/?sh=770a024661d3 (August 2020).

The authors share 6 lessons for leading through change:

1. Share what you know (transparency).
2. Make time for questions.
3. Outline the plan, and share it.
4. Don't try to tackle everything at once. Gradually roll out the plan and give people notice.
5. Mitigate conflict. Resolve in constructive and positive ways.
6. Applaud great work. Deliver kudos on a weekly basis for a job well done.

5. **SHRM (Society for Human Resource Management). (no date) Managing Organizational Change.** SHRM website. Available: www.shrm.org/resourcesandtools/tools-and-samples/toolkits/pages/managingorganizationalchange.aspx (August 2021).

There are six states of change readiness: indifference, rejection, doubt, neutrality, experimentation, and commitment. Leaders should have strategies in place for handling change resistance.

6. **Gleeson, B. 2018. 10 Principles for Leading Through Change: A Navy SEAL's Approach.** Inc. (February 27). Available: www.inc.com/brent-gleeson/10-principles-for-leading-through-change-a-navy-seals-approach.html (January 2021).

This article divides 10 principles into 3 groups:

1. Building a Change Culture:
   - Culture: The chief enabler of change.
   - Trust: Fueling the change engine.
   - Accountability: Ownership at all levels.
2. Preparing for the Change Battle:
   - Mindset: Belief in the mission.
   - Preparation: Gathering intelligence and planning the mission.
   - Transmission: Communicating the vision.
3. Winning the Change Fight:
   - Inclusion: The power of participation and engagement.
   - Fatigue: Managing fear and staying energized.
   - Discipline: Focus and follow-through.
   - Resilience: The path to lasting change.

7. **Gaffney, S. (no date) Leading Through Change.** Steven Gaffney Company website. Available: stevengaffney.com/leading-through-change/ (January 2021).

This work identifies four variables critical to leading people through change:

O = outcome, V = value, B = belief, and S = steps. The author then suggests a simple equation:

$$O \times V \times B \times S = \text{Action} \rightarrow \text{Results}$$

Appendix C: Assessing Center Performance

Ideally, an evaluation of the right size of a Center would include a thorough assessment of the Center's performance relative to its scientific priorities. One of the challenges in doing this is developing clear accountability measures for the range of work that the Center conducts. This section of the report is very brief, as we neither identified nor developed clear performance metrics, but it deserves some discussion.

Publications are in fact a significant metric for scientific performance, and are a central factor in determining scientists' career assessments. However, service and team support are also essential elements of value produced by government scientists. Additional effort could constructively be given to developing better metrics that would capture the diverse scientific contributions made by NWFSC staff. The National Science Foundation (NSF) has done some interesting work on evaluating the effectiveness of large projects.[1]

[1] https://www.nsf.gov/od/oia/eac/index.jsp

Appendix D: Summary of Rightsizing Project Timeline

Before the formal start of the Rightsizing Project, Alan Haynie began visiting NWFSC regularly and meeting with Kevin Werner to discuss some of the changes that have occurred at the Center and the possibility of encouraging greater interdisciplinary research. Alan then took a part-time NOAA Leadership Competencies Development Program (LCDP) detail based on the "rightsizing the Center" idea that Division Directors Penny Swanson and Mike Ford had conceived of and that Deputy Science Director Mark Strom formalized. Seema Balwani then came to NWFSC on detail, with her effort shared between the Rightsizing Project and an evaluation of long-term funding salmon activities at the West Coast Region. Alan and Seema attended NWFSC Leadership Team meetings, presented the project findings both in the middle and near the completion of the project, and presented the project to the NMFS Science Board. Alan also presented the project findings to the Alaska Fisheries Science Center's Board of Directors.

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