

Fish and Floods: Implementation of the 2008 biological opinion on the National Flood Insurance
Program in Washington State

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Abstract

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The National Flood Insurance Program (NFIP) is administered by the Federal Emergency Management Agency (FEMA) and provides flood insurance in communities who comply with minimum standards for building in floodplains. In 2008 a National Marine and Fisheries Service (NMFS) biological opinion concluded that the NFIP violated the 1973 Endangered Species Act (ESA) by jeopardizing threatened salmon and orca populations and their habitat in western Washington State. In the biological opinion, NMFS directed FEMA Region X to make specific changes that would stop additional harm to these species and their habitat in the 122 communities participating in the NFIP in western Washington. This research investigated the intentions and goals of the groups formulating the 2008 biological opinion, whether or not the implementation of the biological opinion had met those goals, and why. The research methods included review of official documents and correspondence, interviews with key figures in the creation and implementation of the biological opinion, and review of news articles and third

party reports on the process. Case studies of two local communities were conducted to determine how different areas operating under different planning constraints received the biological opinion, what steps they took to implement it, and what effect it is having in their jurisdiction. This research was placed in a broader context of salmon restoration programs and floodplain management options in Washington State to illustrate the co-benefits of these policies. The success of the implementation process of Washington's 2008 biological opinion has national implications, since biological opinions on the NFIP are now being litigated or written in other states, including Oregon. As part of a review of the NFIP, FEMA is studying how best to incorporate the goals of the ESA into the NFIP.

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LIST OF ACRONYMS AND ABBREVIATIONS

ACOE: Army Corps of Engineers
ASFPM: Association of State Floodplain Managers
BE: Biological Evaluation
BFE: Base Flood Elevation
Biop: Biological Opinion
CAC: Community Assistance Contacts
CAO: Critical Areas Ordinance
CAV: Community Assistance Visit
CFM: Certified Floodplain Manager
CHART: Critical Habitat Area Review Team
CMZ: Channel Migration Zone
CRS: Community Rating System
DOE: Department of Ecology
DFIRM: Digital Flood Insurance Rate Map
ESA: Endangered Species Act
ESU: Evolutionarily Significant Unit
FCAAP: Flood Control Assistance Account Program
FEMA: Federal Emergency Management Agency
FIS: Flood Insurance Study
FIRM: Flood Insurance Rate Map
HCP: Habitat Conservation Plan
LID: Low Impact Development
LOMA: Letter of Map Amendment
LOMC: Letter of Map Change
LOMR: Letter of Map Revision
LOMR-F: Letter of Map Revision-Fill
GMA: Growth Management Act
NFIA: National Flood Insurance Act
NFIP: National Flood Insurance Program
NMFS: National Marine and Fisheries Service (NOAA Fisheries)
NOAA: National Oceanic and Atmospheric Administration
NWF: National Wildlife Federation
MO: Model Ordinance
MSA: Magnuson-Stevens Act
PSP: Puget Sound Partnership
RBZ: Riparian Buffer Zone
RCW: Revised Code of Washington
RIP: Rehabilitation and Inspection Program, PL 84-99 Levee certification program

RPA: Reasonable and Prudent Alternative
OECD: Organisation for Economic Co-operation and Development
PDI: Planning Director's Interpretation
SEWIP: Snohomish Estuary Wetland Integration Plan
SFHA: Special Flood Hazard Area
SMA: Shoreline Management Act
SMP: Shoreline Management Program
SRKW: Southern Resident Killer Whale
SRP: Salmon Recovery Plan
USFWS: United States Fish and Wildlife Service
VSP: Viable Salmonid Population
WAC: Washington Administrative Code
WRIA: Water Resource Inventory Areas
WSDOT: Washington State Department of Transportation

Introduction

In 2008, the National Marine and Fisheries Service (NMFS) issued a biological opinion on the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP) that concluded the NFIP jeopardized threatened salmon and Southern Resident Killer Whale (SRKW) populations and habitat in Puget Sound.¹ This biological opinion was prompted by a lawsuit brought in 2003 by the National Wildlife Federation (NWF), which alleged that the NFIP was harming threatened salmon and orca populations. The Endangered Species Act (ESA) requires that federal actions which harm threatened or endangered species must consult with an appropriate wildlife agency to determine how best to halt or mitigate that harm.² A court found for the NWF, and required FEMA to consult with the NMFS on how best to protect the species impacted by the NFIP. This consultation resulted in the biological opinion (biop), which documented the harm the program did to the species in question, and contained reasonable and prudent alternatives (RPAs), alternative actions for FEMA to take to cease or mitigate that harm. However, since the NFIP is a voluntary program applied as floodplain management regulations set in place by state and local jurisdictions, 122 jurisdictions in western Washington had the responsibility of implementing the biological opinion and its RPAs in their local codes. The deadline for compliance was September 22, 2011.

As presented, the consequences of non-compliance with the biological opinion ranged from an obligation to have any development permits issued in the floodplain reviewed by NMFS and FEMA before approval, to the loss of federal flood insurance for community members. The requirement of permit-by-permit review of floodplain developments might slow regional

¹ National Marine Fisheries Service, Endangered Species Act Section 7 Consultation Final Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation, 2006-00472, Seattle, WA: 2008, <http://www.fema.gov/library/viewRecord.do?id=6752> (accessed January 19, 2012), 149.

² Code of Federal Regulations, Interagency Cooperation—Endangered Species Act of 1973, as Amended, title 50, sec. 402.

development, but the loss of flood insurance would shift the financial responsibility for flood losses in highly flood-prone areas of Washington to the victims themselves.

The biop is one of the latest efforts to solve a larger regional problem well over a century in the making. Pacific salmon are a source of cultural identity, and have been harvested for food and trade in the Pacific Northwest for centuries. A variety of factors, including habitat destruction, overfishing, degraded water quality, and disease, have reduced salmon populations to a fraction of their historical levels in Puget Sound and the rest of the Pacific Northwest.³ Billions of dollars have already been spent on salmon recovery in the region, but, as NMFS points out in the biop, these efforts have been inadequate.^{4,5} The NFIP is a relative newcomer to the issue, as it only began to influence development in floodplains after 1968. High population growth in the Puget Sound region since then has made the NFIP one of many land use controls that contribute to the destruction of salmon habitat, but it has a disproportionate impact in floodplain lands that support growing salmon.

The NMFS, as required for threatened species, has developed, or begun developing, salmon recovery plans (SRP) for each species listed in the biop. Material from these recovery plans, including proposed mitigation or restoration projects, was included in the biop to describe the current status of the species. These recovery plans, as approved by the NMFS, are the official federal plan for stabilizing the listed species. However, the NMFS concluded in the biological opinion that projected rates of population growth would lead to more damage in floodplains from the current NFIP regulations on development, which would outpace those recovery plan

³ Joseph Taylor, *Making Salmon: An Environmental History of the Northwest Fisheries Crisis* (Seattle: University of Washington Press, 1999), 4.

⁴ Taylor, *Making Salmon*, 3.

⁵ NMFS, Biological Opinion, 149.

restoration efforts.⁶ The biop also details how development allowed under the NFIP will impede efforts planned under the SRPs.⁷

Since the implementation of the NFIP was found to exacerbate the decline of threatened species population and habitat in Western Washington, it must be reformed.⁸ How will that reform effort fit in with the other efforts to restore salmon populations in the region? How will the success of this reform be measured? Has the implementation of this biological opinion supported the larger goal of preserving threatened salmon populations and habitat? Nine years after the process of changing the NFIP to include recognition of ESA regulations on these species' populations and habitat was begun, and a year since it was scheduled to be accomplished, the implementation of the biological opinion remains incomplete. The NWF has filed a second lawsuit calling for an injunction on issuing new flood insurance and processing some types of map changes while the biological opinion remains unimplemented. While the injunction has been denied, the lawsuit is ongoing, and local governments in the Puget Sound region have joined with FEMA as defendants against the NWF. Other states and national programs are looking to this experience in Puget Sound to inform changes to the NFIP in other jurisdictions.^{9,10} What lessons can be taken from this process to inform reform elsewhere?

This thesis is intended to gather and analyze information about the biop and its implementation process in order to answer the following three questions: What were the intentions and goals of the groups formulating the 2008 biological opinion? Has the biop implementation met these

⁶ Ibid., 147.

⁷ Ibid., 133.

⁸ Ibid., 149.

⁹ Graves, John. Interview by author. In person. Seattle, WA, August 24, 2012.

¹⁰ NWF. Interview by author. In person. Seattle, WA, August 9, 2012.

goals? Why has the implementation of the biop met, or not met, the goals of the process participants?

This research was conducted through interviews with key actors and case studies of jurisdictions obliged to conform to the requirements of the biop. The case studies were intended to illuminate the process of compliance with the biological opinion in a jurisdiction operating under a set of planning constraints, and how the involved planners view the necessity and efficacy of the process. The NWF, NMFS, FEMA, and local governments are all key players in this regulation, and they are all operating with different goals, capabilities, and constraints.

This research was intended to be useful for planning, engineering, and scientific professionals involved in issues of the floodplain management raised by the biological opinion, including development in floodplains and the environmental values provided by floodplains. For these readers, this work aims to summarize the efficacy of the biological opinion in western Washington, describe how some professionals have handled it, and provide suggestions for improving the implementation of like measures. Since this is an issue of national importance, it is also intended as an introduction to the topic for professionals who have not yet encountered these issues, and for those unfamiliar with floodplain management, but interested in the broader issues raised in the biological opinion.

Chapter One of this research is a literature review containing background information on the agencies and other groups involved in creating the biop, and a synopsis of the contents of the biop. It also contains a review of the functions of floodplains, salmon lifecycle and habitat, and floodplain management regulation. This section will be particularly useful for readers unfamiliar with floodplain management issues or other terms used in this introduction. The final section of

the literature review explains theories of regulation design and implementation that will illuminate issues identified in these case studies. Chapter Two describes the research methodology. Chapter Three outlines the findings from the informational interviews on the development and intent of the biological opinion and the creation of the implementation programs. It also includes two case studies on how local communities are implementing the biological opinion. Chapter Four discusses the main research questions, and attempts to place this biological opinion in the larger context of salmon restoration efforts in the Pacific Northwest.

Chapter One Literature Review

Regulatory Background

Endangered Species Act

The Endangered Species Act was passed in 1973 to protect threatened and endangered species. It includes a rule about harm to habitat. Section 4 of the ESA sets forth the requirements for determining which species are threatened and endangered.¹¹ Section 7 outlines the responsibility and process for consultation, under which a federal agency is required to consult with the service responsible for threatened and endangered species about how to cease or mitigate that harm.¹²

Endangered species are those likely to become extinct through a significant portion of its range, and threatened species are those likely to become endangered in the near future.¹³ The US Fish and Wildlife Service and the National Marine and Fisheries Service are the ‘services’ responsible for implementing the ESA through listing species, designating critical habitat, and consultation with federal agency. The NMFS is responsible for marine and anadromous species.

Puget Sound Chinook Salmon have been listed as a threatened species since 1999.¹⁴ Puget Sound Steelhead have been listed since 2007.¹⁵ Hood Canal Summer Run chum have been listed as a threatened species since 1999.¹⁶ Lake Ozette sockeye have been listed as a threatened species since 1999.¹⁷

¹¹ Code of Federal Regulations, Listing Endangered and Threatened Species and Designating Critical Habitat, title 50, sec. 424.

¹² 50 CFR sec. 424.

¹³ “Endangered Species Act (ESA),” NOAA Fisheries, last updated March 7, 2013, <http://www.nmfs.noaa.gov/pr/laws/esa/>.

¹⁴ Endangered and Threatened Species: Final Listing Determinations for 16 ESUs of West Coast Salmon, and Final 4(d) Protective Regulations for Threatened Salmonid ESUs, Federal Register v70, n123 (June 28, 2005).

¹⁵ “Puget Sound Steelhead,” NOAA Fisheries, accessed March 11, 2013, http://www.nwr.noaa.gov/protected_species/salmon_steelhead/salmon_and_steelhead_listings/steelhead/puget_sound/puget_sound_steelhead.html.

¹⁶ Endangered and Threatened Species Final Listing, Federal Register v70, n123.

¹⁷ Ibid.

National Marine and Fisheries Service

The National Oceanic and Atmospheric Administration (NOAA) Fisheries service is also known as the National Marine Fisheries Service, and is the descendant of over 140 years of federal marine fisheries management and research.^{18,19} The NMFS is responsible for the management, conservation, and protection of threatened and endangered marine and anadromous species, and has explicit ESA duties including listings, habitat designation, and consultations under sections 4 and 7 of the ESA.^{20,21} Of the more than 1900 listed species under the ESA, the NMFS is responsible for 87 of them.²² The Northwest Regional Office of NOAA prepared the biop in consultation with FEMA Region X in this story. The Magnuson Stevens Fisheries Act, also overseen by NMFS, and considered in the biop, was passed in 1976 and established regional fishery management councils.²³

Federal Emergency Management Agency

FEMA was created in 1979, and among its other duties, took over the administration of the National Flood Insurance Program from the Department of Housing and Urban Development.²⁴ Prior to the creation of FEMA, the federal response to disasters was fragmented, and multiple federal agencies dealt with aspects of disaster response.²⁵ In 1979, President Carter merged disparate responsibilities for disasters into the FEMA, and in 2003 the agency was reorganized as

¹⁸ “History of the National Marine Fisheries,” National Oceanic and Atmospheric Administration, last updated June 4, 2006, <http://www.history.noaa.gov/legacy/nmfshistory.html>.

¹⁹ “Fisheries History,” National Oceanic and Atmospheric Administration National Marine Fisheries Service, accessed March 11, 2013, <http://spo.nwr.noaa.gov/historypubs.htm>.

²⁰ “About National Marine Fisheries Service,” National Oceanic and Atmospheric Administration National Marine Fisheries Service, accessed March 11, 2013, <http://www.nmfs.noaa.gov/aboutus/aboutus.html>.

²¹ “Endangered Species Act (ESA),” NOAA Fisheries.

²² “The Endangered Species Act – Protecting Marine Resources,” NOAA Fisheries Service, accessed March 11, 2013, http://www.nmfs.noaa.gov/pr/pdfs/esa_factsheet.pdf.

²³ “Magnuson-Stevens Fishery Conservation and Management Act Reauthorized,” NOAA Fisheries, accessed March 11, 2013, <http://www.nmfs.noaa.gov/msa2005/>.

²⁴ Federal Emergency Management Agency, National Flood Insurance Program: Program Description, 2002, <http://www.fema.gov/library/viewRecord.do?id=1480> (accessed August 26 2012), 5.

²⁵ “About the Agency,” Federal Emergency Management Agency, last updated October 15, 2012, <http://www.fema.gov/about/>.

a portion of the Department of Homeland Security.²⁶ FEMA remains the administrator of the NFIP, but additional duties include natural and man-made hazard preparedness, prevention, response, and recovery.²⁷

FEMA Region X is the body indicated when the agency is referred to in this research, unless otherwise specified. While FEMA Region X operates under the constraints of the federal organization and cannot be considered a separate agency, the official positions of the national agency have in some instances conflicted with FEMA Region X in this process.^{28,29} FEMA Region X is the regional agency for Alaska, Idaho, Oregon, and Washington, and one of ten regional units of FEMA.³⁰

National Wildlife Federation

The National Wildlife Federation was originally the General Wildlife Federation, a group of conservationists, hunters, and anglers formed in the 1930's by the head of the precursor to the U.S. Fish and Wildlife Service, Dino Darling.³¹ One of the founding purposes of the organization was to influence conservation and environmental policy at a national level.³²

Floodplain protection and restoration is a major policy objective of the NWF, due to the ecosystem and habitat value of the areas, as well as to promote life safety.³³ It has a stated goal of changing the NFIP nationally through a similar procedure of forcing FEMA compliance with

²⁶ Ibid.

²⁷ Federal Emergency Management Agency, "FEMA: Prepared, Responsive, Committed," FEMA B-653, July 2008, <http://www.fema.gov/pdf/about/brochure.pdf> (accessed March 11, 2013).

²⁸ Graves Interview.

²⁹ NWF Interview.

³⁰ "Region X: AK, ID, OR, WA," Federal Emergency Management Agency, last updated October 29, 2012, <http://www.fema.gov/region-x>.

³¹ "Creation of National Wildlife Federation," National Wildlife Federation, accessed March 11, 2013, <http://www.nwf.org/About/History-and-Heritage/Creation-of-NWF.aspx>.

³² Ibid.

³³ "Coast and Floodplain Protection and Restoration," National Wildlife Federation, March 11, 2013, <http://www.nwf.org/Wildlife/Policy/Floodplains-Management.aspx>.

the ESA through state-by-state litigation.³⁴ In 1994, the NWF sued FEMA in Florida for violating the ESA by damaging Key Deer populations and habitat.^{35,36} In a follow-up case in 2005, an injunction was issued against floodplain insurance for new development in the area as a result of inadequate response by FEMA to the consultation decision in the initial case.³⁷

The 2008 Biological Opinion

In 2003, the NWF filed a lawsuit in the Washington State Western District Court against FEMA. The Public Employees for Environmental Responsibility were also named as plaintiffs, and the National Association of Home Builders were also named as defendants.³⁸ In 2004, the judge issued a summary judgment finding that the plaintiffs had standing to bring the case, that FEMA had violated section 7(a)(2) of the ESA by failing to consult with the NMFS on the effects of floodplain management, mapping techniques, and the Community Rating System (CRS), a program of the NFIP.³⁹ FEMA was ordered to consult with NMFS on those discretionary elements of the NFIP, but not on the sale of flood insurance itself.⁴⁰ The court found that the NFIP encouraged development in floodplains based on information from congressional sources, including the Final Environmental Impact Statement of the Flood Insurance Act and information from FEMA and the National Association of Home Builders themselves.^{41,42} The court also cited FEMA documentation claiming that filling in the floodplains, allowed in the NFIP, would be detrimental to floodplain habitat, and might constitute a ‘take’ under the ESA.⁴³ The court

³⁴ Ibid.

³⁵ “Coast and Floodplain Protection and Restoration”.

³⁶ *Florida Key Deer v. Stickney*, 864 F. Supp. 1222, (S.D. Florida. 1994).

³⁷ “Coast and Floodplain Protection and Restoration”.

³⁸ *National Wildlife Federation v. FEMA*, 345 F. Supp.2d 1151 (W.D. Wash 2004).

³⁹ *National Wildlife Federation v. FEMA*, 1177.

⁴⁰ Ibid.

⁴¹ Ibid., 1157.

⁴² Ibid., 1158.

⁴³ Ibid.

determined that in the case of the NFIP, the FEMA had discretion to act in a way that upheld the ESA in floodplain minimum criteria, mapping, and the CRS, but not in issuing insurance, which was deemed a critical issue.^{44,45}

The first lawsuit filed against the NFIP on an ESA listed species was in 1994, when the NWF sued on behalf of Key Deer in Florida in *Key Deer vs. Stickney*.⁴⁶ However, while the result of that case was also a requirement for FEMA to consult with the United States Fish and Wildlife Service (USFWS), the consultation and implementation process has been so contentious that an injunction against floodplain insurance on new development in the area was issued in 2005.⁴⁷

In *Key Deer vs Stickney*, the court pointed out that the possibility that development might occur in floodplains without the NFIP was immaterial to consultation on the possible development impacts of the program.⁴⁸ The court also pointed out that it was not necessary for the plaintiffs to show a direct cause and effect relationship between the NFIP and floodplain development, as long as they showed that the NFIP led to a “substantial likelihood” of an injury “fairly traceable” to the program, and that their proposed remedy (in this case, an injunction against the program to consult with the USFWS) would have a “substantial likelihood” of redressing the injury.⁴⁹

In the Washington biop, In February 2006, FEMA submitted a Programmatic Biological Evaluation (BE) of the NFIP to NMFS as a starting point for the development of the court-ordered biological opinion. The BE found that the NFIP was not likely to adversely affect ESA-

⁴⁴ *Ibid.*, 1172-1174.

⁴⁵ *Ibid.*, 1169.

⁴⁶ “Coast and Floodplain Protection and Restoration”.

⁴⁷ *Ibid.*

⁴⁸ *Florida Key Deer v. Stickney*, 11.

⁴⁹ *Florida Key Deer v. Stickney*, 2.

listed species in the state.⁵⁰ The subsequent biological opinion was written by NMFS in consultation with FEMA, who had input in the process from the submission of the BE, during the draft of the biop, and during the development of the RPAs.^{51,52}

The biological opinion contains a summary of the FEMA action- the NFIP- and the area it impacts, a description of the included species and their habitat needs, the effects of the NFIP on the included species, the reasonable and prudent alternative with 7 elements, and an incidental take statement. The biological opinion also includes conservation recommendations for the Manguson-Stevens Fisheries Act, which mirror the reasonable and prudent alternatives. The opinion focuses effects on endangered species under the purview of the NFMS in Puget Sound, which are Puget Sound chinook salmon, Puget Sound steelhead, Hood Canal summer-run chum salmon, Lake Ozette sockeye salmon, and Southern Resident killer whales. The biological opinion concluded that the NFIP was likely to jeopardize the continued existence and adversely modify the critical habitat of Puget Sound chinook salmon, Hood Canal summer-run chum salmon, and Southern Resident killer whales. Since Puget Sound steelhead critical habitat has not been designated, that was not included in the habitat effect ruling, though its continued existence was found to be in jeopardy.⁵³ The biological opinion is phase one of a two phase document determining effects of the NFIP on threatened and endangered species in the rest of Washington state.⁵⁴ This research does not focus on Lake Ozette sockeye salmon, which are not considered to be in jeopardy due to the NFIP in Puget Sound communities.⁵⁵

⁵⁰ NMFS, Biological Opinion, 1.

⁵¹ Shorin, Bonnie. Interview by author. In person. Lynnwood, WA, August 13, 2012.

⁵² Graves Interview.

⁵³ D. Robert Lohn, NMFS Regional Administrator, to Mark Eberlein, FEMA Region X Regional Environmental Officer, Seattle, September 22, 2008, NMFS Tracking No. 2006/00472.

⁵⁴ NMFS, Biological Opinion, 1.

⁵⁵ *Ibid.*, 117.

The biop focused its analysis on the discretionary elements of the NFIP as determined by the court, and especially on the effect of fill and levees on floodplain habitat, based on the information in the request for consultation and the BE.⁵⁶ The document cites the court case evidence and evidence provided by FEMA to conclude that the NFIP leads to floodplain development, and points out that between 2-10% of mapped urban growth areas in WA are also mapped as floodplains.^{57,58}

NMFS identifies the practice of filling floodplains to raise structures above the base flood elevation (BFE), the level of the 100-year flood, as the most damaging practice for salmon habitat.⁵⁹ Levee vegetation standards used by FEMA were also identified as damaging for salmon habitat.⁶⁰ The mapping element of the NFIP allows portions of the floodplain to be removed from maps after fill or the construction of levees to these standards, which encourages fill and the removal of vegetation from levees. Fill placed in salmon habitat areas destroys that habitat, displaces floodwaters to other areas with fewer habitat values, and constrains the area in which floodwaters flow, causing it to flow more quickly and with higher erosive force, leading to disturbance of habitat areas for fish and humans in other areas of the river.⁶¹ NMFS concluded that the NFIP was likely to jeopardize the continuing existence of Puget Sound chinook, Puget Sound steelhead, and Hood Canal summer run chum, and to destroy or adversely modify the designated critical habitat of Puget Sound chinook and Hood Canal summer run chum.⁶²

⁵⁶ Ibid., 2.

⁵⁷ Ibid., 3.

⁵⁸ Ibid., 4.

⁵⁹ Ibid., 15.

⁶⁰ Ibid., 83.

⁶¹ Ibid., 92.

⁶² Ibid., 149.

Based on this conclusion, the NMFS prepared a RPA with 7 elements that would allow FEMA to avoid violation of the ESA 7(a)(2) responsibility to the endangered species. The actions in the RPA were determined to be sufficient to meet those responsibilities, consistent with the intended purpose of the NFIP, consistent with the scope of FEMA's legal authority and jurisdiction, and economically and technologically feasible for FEMA to implement, as required of RPAs developed in biological opinions.⁶³ The language in these elements used the imperative terms “will” and “shall”.

RPA Element 1 stipulated that FEMA should, within 30 days notify all NFIP participating communities in the action area of the jeopardy finding, identify which communities were in Tier 1 and Tier 2 communities, designations based on the value of the habitat available in each participating community, and advise communities to place a temporary moratorium on development in floodplain areas. Communities were also notified that adoption of the criteria in RPA Element 3 would fulfill their responsibilities under the ESA.⁶⁴

RPA Element 2 specified certain changes to the NFIP mapping program, with a deadline of 6 months from the issuance of the biop, and required annual reports on the progress on this RPA element.

- Letters of Map Change (LOMC) would only be processed if the proponent of them demonstrated that the alteration to the river channel and floodplain habitat avoided functional changes to habitat, or mitigated for those changes. FEMA was tasked further with making sure that potential future effects from the alterations were mitigated, reporting on those mitigations to NMFS, and consult with the NMFS on LOMCs

⁶³ Ibid., 150.

⁶⁴ Ibid., 151.

involving floodplain alteration between issuance and full implementation of the RPA element.

- FEMA was required to prioritize mapping activity based on salmon populations identified in an appendix to the biop, to issue a technical bulletin on the use of unsteady state hydraulic models for floodplain mapping, to use two- dimensional models in estuarine floodplains and other areas, and to revise modeling to incorporate on-the-ground data.
- Future conditions and cumulative effects from future land use changes, including changes in the watershed, hydrology, and changes from climate change may impact flood risk in the future, and FEMA was to ensure that communities used these future land use changes when determining flood elevations. FEMA was also to encourage the use of these future conditions in evaluating flood risk behind levees.⁶⁵

RPA Element 3 set new requirements for floodplain management criteria, as described in Appendix 4. FEMA was to report to NMFS on these changes annually. FEMA was directed to revise the implementation of the NFIP minimum criteria to either allow no development in the floodway, the channel migration zone (CMZ) plus 50 feet, and the riparian buffer zone (RBZ), or to have the local jurisdiction demonstrate to FEMA that any proposed development in those areas would not adversely affect water quality, water quantity, flood volumes, flood velocities, spawning substrate, or floodplain refugia.⁶⁶ The RBZ was defined as the greater of 250 feet from ordinary high water for shorelines of the state, 200 feet from fishbearing streams, or 150 feet from streams less than 5 feet wide or lakes, the CMZ plus 50 feet, or the mapped floodway.⁶⁷ In

⁶⁵ Ibid., 152.

⁶⁶ Ibid., 154.

⁶⁷ Ibid., 222.

addition, any development in the 100 year floodplain must be prohibited, or development in that floodplain but outside of the RBZ that caused loss of floodplain storage had to be compensated for. Any other adverse effects of development in the floodplain also had to be mitigated with salmon habitat in mind, and these projects must be tracked and reported to FEMA. Construction in the floodplain would be required to use Low Impact Development (LID) methods as described by the Low Impact Development Technical Guidance Manual for Puget Sound.⁶⁸ Any improvements or repairs that would increase structural footprints by 10% would also have to be mitigated.

Section B of Element 3 mandated that FEMA oversee the adoption of these measures by participating NFIP communities within 3 years, with 35% of participating communities and all of the Tier 1 communities adopting element 3 within 2 years of the issuance of the biop, 70% of participating communities and all of Tier 2 adopting within two and a half years, and all communities adopting by three years after the issuance of the biop. This timeline was later amended to allow all communities 3 years to implement the biop. FEMA was to report to NMFS on the status of compliance until all communities had adopted this element.

In the time period between the issuance of the biop and full compliance, FEMA was also tasked with gathering information and reporting to NMFS on all floodplain development permits issued in the action area, and mitigating those that caused adverse effects to salmonid habitat.⁶⁹ After compliance, this reporting on the number of floodplain projects and effectiveness of any project

⁶⁸ Ibid., 154.

⁶⁹ Ibid., 155.

mitigation was to continue, and FEMA was directed to oversee any additional mitigated needed, in consultation with the NMFS, from those reports.⁷⁰

RPA Element 4 required FEMA to change the CRS program within 9 months of issuance of the biop to create incentives for the use of LID in stormwater credits, increase the CRS points available for preservation of open space and areas to be preserved under NMFS adopted salmon recovery plans, increase points for encouraging the relocation of development in the floodplain prior to the issuance of floodplain maps (pre-FIRM structures), to award points for retaining and increasing riparian functions and setting levees back or dismantling them as part of a comprehensive flood damage reduction plan, reduce points for structural changes that reduced functional floodplain area, encourage levee vegetation practices that benefit salmonids, include a category of actions in the program that benefit salmonids, and add CRS credits for community buy-out programs for acquiring floodplain properties, development rights, or flood easements.⁷¹

RPA Element 5 on levee vegetation was to be adopted within one year of issuance by FEMA, and progress on it was to be reported to NMFS by FEMA on an annual basis. FEMA was directed to not recognize levees certified with Army Corps of Engineers (ACOE) vegetation standards unless those standards were shown to not adversely affect species or habitat, to revise their directions to levee owners to reflect that levees could be certified for funding for emergency repairs after flood damages even if they housed vegetation prohibited under the PL 84-99 program, and to use and encourage the use of FEMA's Hazard Mitigation Grant funding and

⁷⁰ Ibid., 156.

⁷¹ Ibid., 159.

Flood Mitigation Assistance Programs for projects that reduce flood risk and also benefit salmonids.⁷²

RPA Element 6 directed FEMA to ensure that any activities occurring in the floodplain that degrade species habitat or negatively impact threatened populations prior to full compliance with the biop be mitigated, either by FEMA or local communities.⁷³

RPA Element 7 stipulated that FEMA must report annually on the progress in implementation of the RPA elements and sub-elements, in order to determine if new RPA elements are needed to avoid species jeopardy and adverse modification of habitat.⁷⁴ An incidental take statement set maximum take based on a calculation of floodplain land likely to be lost before the full implementation of the biop.⁷⁵

An additional section of recommended changes (“should” changes) to the NFIP and FEMA actions to minimize harm to fish were included in the biop. Some of these items included coordination with other agencies in mapping, further coordination with the ACOE on vegetation standards on levees, development of flood maps with additional hazards noted, reassessment of the benefit/cost regulations used by the Office of Management and Budget, and a change to the NFIP to include a no-rise floodway.⁷⁶ In the document, NMFS also recommended that FEMA adopt more fish-friendly vegetation standards for levees, instead of relying on ACOEs own standards.⁷⁷

⁷² Ibid., 161.

⁷³ Ibid., 162.

⁷⁴ Ibid.

⁷⁵ Ibid., 168-174.

⁷⁶ Ibid., 175-178.

⁷⁷ Ibid., 86.

Two errata were issued for the biop. The first corrected a reference to the Flood Mitigation Assistance Program.⁷⁸ The second corrected multiple details, including typos, take statements for Thurston County, and community tier designations, and increased the size of the Riparian Buffer Zone (RBZ) around shorelines of the state, fish-bearing streams, and other streams and lakes.⁷⁹

NMFS expected FEMA to implement the biop by requesting that local communities adopt standards from an existing salmon-friendly floodplain management document, the Higher Regulatory Standards, prepared after the listing of salmon as a threatened species by FEMA.^{80,81} NMFS also hoped that FEMA would also go to a rule-making process that would amend their floodplain management minimum criteria for the NFIP. Chapter Three of this thesis describes the implementation program designed by FEMA after the issuance of the biop.

Floods and Fish

Flooding in the Environment

Precipitation gathers as surface run-off in streams and rivers, and carries water, material, and energy from higher areas of land to gather in larger water bodies or oceans. The patterns of that surface water flow depend on topographic and geologic composition of an area, as well as precipitation cycles and vegetative cover in the region. As run-off channels and streams converge

⁷⁸ Steven Landino, Washington State Director for Habitat Conservation, to Mark Eberlein, FEMA Region X Regional Environmental Officer, Seattle, October 23, 2008, NMFS Tracking No. 2006/00472, Biological Opinion Errata.

⁷⁹ Steven Landino, Washington State Director for Habitat Conservation, to Mark Eberlein, FEMA Region X Regional Environmental Officer, Seattle, May 14, 2009, NMFS Tracking No. 2006/00472, Biological Opinion Errata 2.

⁸⁰ Shorin Interview.

⁸¹ NMFS, Biological Opinion, 168.

and enter areas with gentler slopes, these streams and rivers begin to slow down and develop meandering patterns, as shown in Figure 1.1. The slower pace of the flowing rivers allows the deposit of sediment, fallen logs, and other material collected upstream in the river system.⁸²

Watersheds, also called catchments or drainage basins, are areas where all surface water flows to the same point, such as the outlet of a river to the sea. A large river system may encompass smaller watersheds in its wider drainage basin.

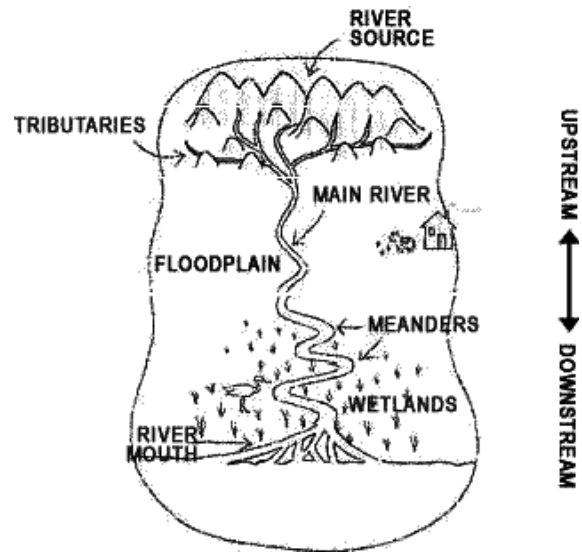


Figure 1.1: River Diagram

Source: Canadian Council for Geographic Education.

In Puget Sound, surface run-off and river flows are generated by groundwater input, snowpack and glacial melt, stored water in the Cascades and Olympics, and more immediate precipitation events. During concentrated precipitation events, often fed by atmospheric rivers from the Pacific, and periods of increasing snowmelt in the mountains, rivers in Puget Sound flood their regular channels, depositing waters in the floodplains of Puget Sound. These flooding events are most common in winter and spring in the Puget Sound region, and help spread sediment in the floodplain, create habitat areas, and may change the course of river channels entirely after the period of flooding.⁸³ Floodplains are areas that are typically dry, but are inundated predictably, and can be categorized by the frequency and depth of inundation, which is specific to the land area and the rivers that flood them. For instance, a 100 year flood is a term of measurement for a volume of flow through a river system that will only be exceeded once in 100 years. The area that this volume of flow will cover is the

⁸² Park, Chris C., *Environment: Principles and Applications* (London: Routledge, 2001), 371.

⁸³ NMFS, Biological Opinion, 103.

100 year floodplain. A 500 year floodplain is a similar concept, but, depending on topography, will cover a larger area than a 100 year floodplain. These measurements of frequency are only as good as collected flow data, and they are not static. At a given location, changes in topography nearby and upstream, as well as changes in stream flow volume patterns, will influence the frequency, location, and depth of flooding events. Historical flow data may not reflect ongoing changes to flow patterns in a way that accurately describes current flood risks.

Flooding is an inevitable result of variations in precipitation on land, and the Puget Sound ecosystem has historically encompassed the vagaries of flood events. Rivers meandered through the lowlands, reshaping their main channels slowly or quickly, as flow volume allowed. Floodplain land created habitats for aquatic and land species, and floods deposited nutrients and moisture for vegetation. Larger or quicker floods could wipe out flora and fauna with fast currents and high water volumes, but healthy species had time to reestablish themselves between events. A flood is not a hazard by itself; it is just a hydrological event. Floods become hazards when they cause damage to objects or areas of value, or to human life.

Along with the retention of flood waters, floodplains provide other environmental and economic benefits. These co-benefits include the provision of important habitat area for threatened populations of salmon. The benefits of ecosystem services, like habitat provision and floodwater retention, have been quantified in economic terms. A report by Earth Economics estimated the value of ecosystem services provided by riparian buffer areas, or 50 feet buffer zones around streams and rivers, to be between \$229.57 and \$29,046 per acre per year in the Snohomish River Basin.⁸⁴ In the Puyallup Basin, riparian forest lands were found to provide values to local

⁸⁴ Earth Economics, *The Whole Economy of the Snohomish Basin: The Essential Economics of Ecosystem Services*. 2011, accessed March 11, 2013,

economies of between \$321 and \$30,532 per acre per year.⁸⁵ These values include the value of services provided by gas and climate regulation, disturbance regulation, water flow regulation, water treatment, habitat, and aesthetic, recreational, and cultural values of these areas beside streams and rivers which overlap with floodplain areas. Removal of floodplain land, or destruction of its ability to provide services like habitat, water treatment, and disturbance regulation, has economic consequences for the Puget Sound region. If floodplains no longer provide these services, these values to the Puget Sound regional economy will be lost, or costly simulations or replacements of these services must be created. The long list of ecosystem services provided also indicates the co-benefits of preserving floodplains in Puget Sound.

Before settlement, the low-lying areas of Puget Sound were forested, and logjams of fallen trees acted as small dams to create floodplain areas where fish thrived. Habitat loss from the destruction of these logjams and urbanization that cleared the forest is a more important factor in the decline of salmon in Puget Sound than the building of large dams in the upper reaches of rivers.⁸⁶ Before settlement in Puget Sound, flooding cycles connected floodplain habitat to main river channels, and large flood flows were absorbed by forests. Increasing urbanization of Puget Sound turned normal hydrological processes into a hazard. Cleared forest areas could no longer absorb large amounts of floodwater, causing flood flows to runoff and amass, causing ‘flashier’ floods, which are quicker and deeper than flooding in areas with uninterrupted hydrology. The destruction of floodplain functions that increase flooding risks to people, especially in urban areas, also decrease the habitat function of floodplains for salmon and other aquatic species.

http://www.eartheconomics.org/FileLibrary/file/Reports/Snohomish/Earth_Economics_Snohomish_Basin_Report.pdf, 56.

⁸⁵ Earth Economics, *The Puyallup River Watershed: An Ecological Economic Characterization*, 2011, accessed March 11, 2013, http://issuu.com/earth_economics/docs/puyallup_river_watershed, 48.

⁸⁶ David Montgomery, ed., *Restoration of Puget Sound Rivers* (Seattle: University of Washington Press, 2003), 2.

Ecosystem service valuations are measures of the economic value of the work performed by environmental resources.

Levees were built to protect settlement from flooding, as a form of man-made disturbance regulation, and rivers were cleared and channelized to aid navigation and trade. Figure 1.2 shows the current locations of levees in the Puget Sound area. The urban growth areas and urban centers are mapped by the Puget Sound Regional Council. Urban centers are areas of existing high-density development, and urban growth areas are those designated under Washington's Growth Management Act (GMA) to receive anticipated population growth. Levees overlap with the habitat of threatened salmon species, especially in urbanized areas, and when they are placed close to the main channel of the river, cut off floodplain access for those populations.

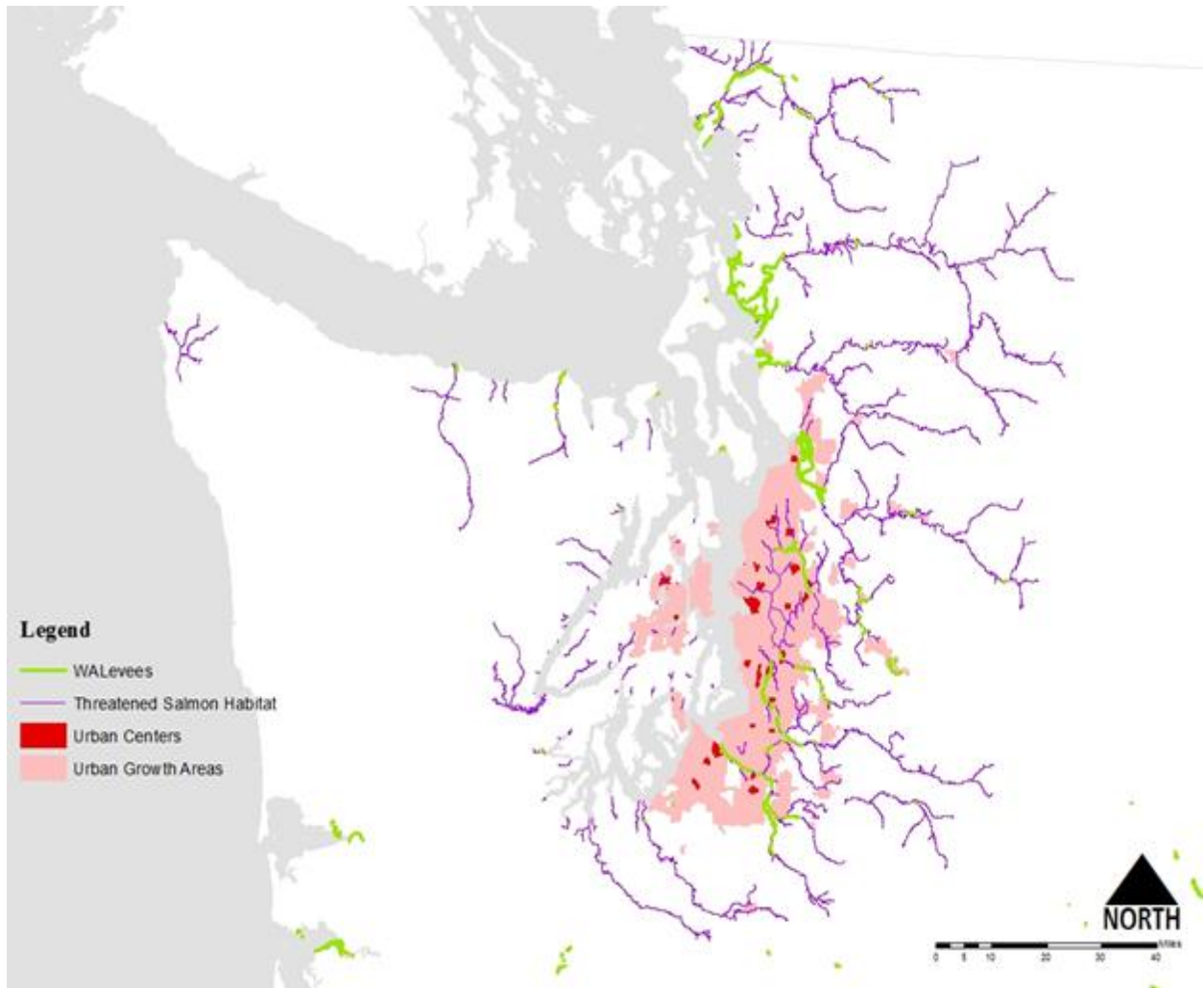


Figure 1.2: Levees around Puget Sound

Source: Map by author

National Flood Insurance Program

The NFIP was established by the National Flood Insurance Act (NFIA) in 1968 as a response to increasing flood losses and the lack of availability of private flood insurance.⁸⁷ The NFIA established the three major components of the NFIP: floodplain mapping, floodplain management regulations, and flood insurance. It made state and local governments responsible for implementing basic floodplain management as a precondition for residents of those areas to

⁸⁷ FEMA, NFIP Program Description, 2.

purchase flood insurance. That purchased insurance was intended to shift the financial burden of post-disaster relief away from the federal government.⁸⁸ Residents of communities that had not adopted minimum floodplain management regulations would be unable to purchase the federally-backed flood insurance, but might also not be eligible for certain types of disaster assistance after a flood.

Since 1968, the NFIP has been amended numerous times, but the three basic provisions of the program remain the same. The Flood Disaster Protection Act of 1973 included the Mandatory Flood Insurance Purchase Requirement, which required that federally-backed loans on structures in the 100 year floodplain, or Special Flood Hazard Area (SFHA), have flood insurance.⁸⁹ The Coastal Barrier Resources Act in 1982 excluded some coastal areas from eligibility for flood insurance in order to preserve them from development.^{90,91} The 1994 National Flood Insurance Reform Act codified the Community Rating System, stipulated that FEMA reassess the flood hazard map inventory at least every 5 years, and created the Flood Mitigation Assistance grant program.⁹² The Flood Insurance Reform Act of 2004 attempted to reduce the amount of repetitive loss properties covered by the NFIP. In 2012, the Biggerts-Waters Flood Insurance Reform Act phased out subsidized insurance rates for some types of structures.⁹³

The Community Rating System (CRS) provides discounts on flood insurance premiums to communities that raise their floodplain management standards above the minimum.⁹⁴ While CRS

⁸⁸ Ibid.

⁸⁹ Ibid., 3.

⁹⁰ Ibid., 10.

⁹¹ “Coastal Barrier Resources Act,” U.S. Fish and Wildlife Service, last updated January 24, 2013, <http://www.fws.gov/CBRA>.

⁹² FEMA, NFIP Program Description, 4.

⁹³ Nechamen, Bill and Merrie Inderfurth, “Biggert-Waters Flood Insurance Reform Act of 2012,” accessed March 11, 2013, http://www.floods.org/ace-files/documentlibrary/2012_NFIP_Reform/2012_NFIP_Reform_Act_ASFPM_Summary_of_Contents.pdf, 1.

⁹⁴ NMFS, Biological Opinion, 20.

credits may be issued for habitat enhancement actions in floodplains, they may also be issued for activities that are detrimental to salmon species, including structural flood control projects that may damage or destroy salmon habitat and removal of debris that provides shelter for those species.^{95,96} Residents of communities that earn enough CRS credits to reach higher program tiers will get larger discounts on their flood insurance.

The monitoring processes for communities who participate in the NFIP are scheduled Community Assistance Contacts (CAC) and Community Assistance Visits (CAV). FEMA, or a designated state coordinating agency, will periodically contact or visit a local community to determine if they are adequately enforcing their floodplain management regulations. In Washington, the state coordinating agency is the Department of Ecology (DOE). Floodplain development permits required under section 9 of the ESA are already checked during CAVs made by FEMA and the Washington Department of Ecology (DOE).⁹⁷ CACs are used to determine if a community program requires the further examination provided by a CAV, where FEMA or DOE staff come in to meet with the floodplain management staff, review floodplain permits, and tour local floodplains.⁹⁸ Communities found to not be meeting the requirements may be placed on probation or suspended from the NFIP, and their residents unable to purchase flood insurance, though that is very rare.⁹⁹

Floodplain Mapping

Flood insurance maps are intended to communicate the risk an area has of flooding by delineating the extent and depth of flood waters with specific probabilities of occurring. Flood

⁹⁵ FEMA, NFIP Program Description, 20.

⁹⁶ NMFS, Biological Opinion, 90.

⁹⁷ NMFS, Biological Opinion, 9.

⁹⁸ Ibid., 19.

⁹⁹ FEMA, NFIP Program Description, 19.

insurance maps show the 100-year flood elevation, which is the base flood, and the boundary of the Special Flood Hazards Area (SFHA). Figure 1.3 illustrates some of the terms used on NFIP maps. A community must have flood maps to participate in the NFIP, but initial flood insurance is available in the community once a Flood Insurance Study (FIS) is begun to create those maps. The earliest Flood Insurance Rate Maps (FIRMs) were generated by hand from hydraulic studies of an area. They were based on data from previous floods, and the available historical stream flow gage data in the area.¹⁰⁰ Digital flood insurance rate maps (DFIRMS) are created either by digitizing maps of the hand-drawn floodplain boundaries, or by incorporating new flow and topography data into hydraulic models to create newer maps. While updates are being made to existing maps, many communities have outdated flood maps, due in part to the lack of funding for the research and modeling necessary to update the maps.¹⁰¹

¹⁰⁰ Ibid.

¹⁰¹ Ibid., 11.

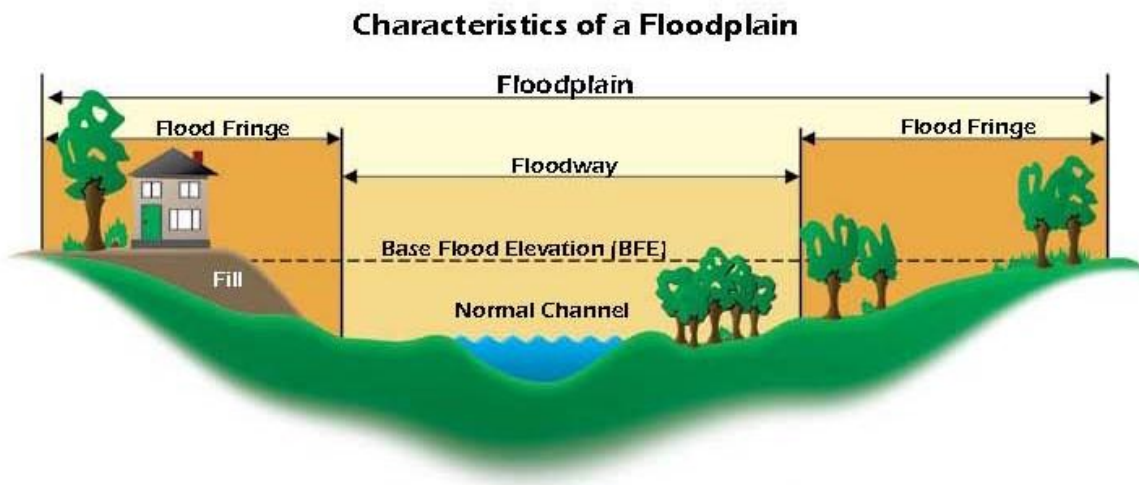


Figure 1.3: Floodplain Diagram

Source: Umatilla County

“Approximate” or “Detailed” analysis may be used for floodplain mapping in an FIS. Data used for approximate maps may include past flood information, simplistic hydraulic or hydrologic studies. Approximate maps do not include a base flood elevation or floodway boundary. Only SFHAs are designated in approximate studies. Detailed analysis uses a more complex set of modeling tools, studies, and maps to determine BFEs, flood depths, floodways, and SFHAs. The base flood elevation is the projected elevation of a 100-year flood. The floodway is defined as the stream channel plus adjacent floodplain area that must be kept clear so that the base flood does not increase by more than a foot.¹⁰² Future conditions, including land use changes or climate change, are not a required part of the map, but as of 2001, FEMA allows the floodplain maps to reflect future hydrological conditions and their potential changes to flood maps.

Flood maps may be changed through several processes, including a Letter of Map Amendment (LOMA), a Letter of Map Revision (LOMR, or LOMR_F if the map revision is based on floodplain filling). These are also called, in general, Letters of Map Change (LOMC). FEMA

¹⁰² FEMA, NFIP Program Description, 6.

does not collect data on the amount or extent of fill placed in floodplains to justify a LOMC, but the data on these permits for the state of WA provided during the NMFS consultation indicated that 158 of the 2262 LOMCs issued in the state were for fill.^{103,104} NMFS found several instances of fill placed in critical habitat for listed salmon species.¹⁰⁵

Levees certified by the Army Corps of Engineers (ACOE) or a professional engineer will be included in the FIRM, and land behind levees will be mapped as outside the floodplain. Changes in levee certification can change FIRMs quickly. FEMA does not design, build, finance, or certify levee systems, but criteria in the NFIP specifies when a levee may be placed in a FIRM as protecting the properties located behind it. The design, operations, and maintenance criteria for levees specify that they must have a certain amount of freeboard above flood height and be certified by a registered Professional Engineer or a federal agency that designs levees.¹⁰⁶ The Army Corp of Engineers certifies most levees in WA, and pays for the certification process of levees they inspect.¹⁰⁷ Certification of levees by other groups has to be paid for by the owner or operator of the levee.¹⁰⁸ Levees certified by the ACOE are included in the Rehabilitation and Inspection Program (RIP), of the P.L. 84-99 program.¹⁰⁹ Vegetation maintenance standards for the RIP program require removal of trees greater than 2 inches in diameter, though the ACOE Seattle District has issued a variance, allowing trees of up to 4 inches.¹¹⁰ These vegetation standards have been adopted to prevent the structural integrity of levees from being

¹⁰³ NMFS, Biological Opinion, 9.

¹⁰⁴ Ibid.

¹⁰⁵ Ibid., 10.

¹⁰⁶ FEMA, NFIP Program Description, 8.

¹⁰⁷ NMFS, Biological Opinion, 13.

¹⁰⁸ Ibid.

¹⁰⁹ Ibid.

¹¹⁰ Ibid.

compromised by plant roots.¹¹¹ FEMA does not have separate standards for vegetation on levees.¹¹² This removal of vegetation on levees could negatively impact habitat along levees, since vegetated bank areas provide material for shelter and shade, on which threatened salmon species rely.¹¹³

Floodplain Management

Land use rules are local powers, based on the police power reserved for states. Floodplain management regulations rely on these local powers to regulate land uses and development, and require and approve permits for actions on personal property. FEMA, as a federal agency, can only exercise the power of the purse; only offering insurance federal aid in SFHAs after disasters, and some grants in communities that exercise their own police powers to regulate floodplains.

The minimum criteria that must be adopted by communities to participate in the NFIP are outlined in 44 CFR 60.3.¹¹⁴ Requirements are included for development review and permitting, as well as for regulation of the form and placement of development. Where SFHA maps are available for riverine flooding, communities must ensure that all new or substantially improved residential structures are elevated to or above the BFE on piles or fill, and new or substantially improved non-residential construction may be elevated to or above the BFE on piles or fill, or flood-proofed (i.e., made impermeable to water).¹¹⁵ In areas of coastal flooding, all new or substantially improved development must be elevated to or above the BFE on piles.

Additionally, communities must designate the regulatory floodway, which is an area that will

¹¹¹ U.S. Army Corp of Engineers, “Literature Review – Vegetation on Levee,” ERDC SR-10-2, December 2010, http://www.nws.usace.army.mil/Portals/27/docs/Levees/ERDC%20Literature_Review-Vegetation.pdf, 4.

¹¹² NMFS, Biological Opinion, 14.

¹¹³ Ibid.

¹¹⁴ Code of Federal Regulations, Land Management and Use, title 44, sec. 60.

¹¹⁵ FEMA, NFIP Program Description, 13.

carry the 100 year flood volume without increasing the flood elevation by more than a foot at any point. Development in the regulatory floodway must not cause increases in determined flood height. These regulations do not apply to structures existing in the SFHA prior to mapping, or “pre-FIRM” structures, until they are substantially rebuilt, either for a renovation or to repair damage from a flood or other disaster.¹¹⁶

States are required to adopt the NFIP floodplain management regulations for properties they own. States may also mandate higher floodplain management regulations that then take precedence over the NFIP minimum requirements, though Washington state currently forbids the DOE to adopt floodplain management requirements that exceed FEMA’s minimums, except in specific local areas, and only after a lengthy period of study, negotiation, and public comment.^{117,118} Currently, the only standard above the NFIP minimum maintained by the state is a prohibition on most types of residential structures in the floodway.¹¹⁹

Flood Insurance

Flood insurance is available from agents dealing directly with FEMA, and from private insurance companies backed by FEMA, though 95% of the policies held in 2002 were with private companies.¹²⁰ The purchase of flood insurance is mandatory in a SFHA, but any resident of a participating NFIP community may purchase flood insurance. When complete FIRMs are available for a community, coverage limits are \$250,000 worth of coverage for residential units and \$100,000 for personal property.¹²¹ For non-residential buildings, coverage limits are \$500,000 for buildings and \$500,000 for personal property. For pre-FIRM buildings, flood

¹¹⁶ FEMA, NFIP Program Description, 15.

¹¹⁷ FEMA, NFIP Program Description, 20.

¹¹⁸ “Duties of the Department of Ecology,” Washington State Legislature, RCW 86.16.031.

¹¹⁹ “Additional Floodway Requirements,” Washington State Legislature, WAC 173-158-070.

¹²⁰ FEMA, NFIP Program Description, 22.

¹²¹ *Ibid.*, 25.

insurance is available at subsidized rates. Actuarial rates, or the rates an insurance company charges for coverage of a property based on the projected risk to that property, are charged for all insured structures built after 1974 or the completion of a FIRM, whichever came later.¹²²

NFIP Criticism and Reform

The NFIP is a troubled program. In addition to the criticism of the floodplain management minimum criteria as inadequate to protect habitat, the floodplain mapping program and flood insurance programs have also been the subject of criticism. Floodplain maps currently represent flooding hazards with lines designating which areas are hazardous and which are not. An area is either in or out of the 100 year flood. This binary representation of flood risk is misleading, since the floodplain maps represent statistical chances of risk. A 2004 study by Goodwin found that one in four flood losses were in an area outside of a mapped floodplain.¹²³ The term ‘100 year flood’ is also misleading, since it seems to indicate a flood that only happens once in 100 years, leading people to a false sense of security. In a review of the 100 year standard for maps, Carolan recommended communicating a vertical measure of flood risk instead of a horizontal measure.¹²⁴ A report by the National Academies recommended that FEMA change the way flood risks are represented on maps, by specifying what types of hazards are created by flooding, and relating flood risks by inundation depth to individual structures.¹²⁵

A review of the economics of the flood insurance sold through the NFIP by Michel-Kerjan concludes that the program is not financially self-supporting, due to the impacts of larger flood

¹²² Ibid., 26.

¹²³ Michael S. Carolan, “One step forward, two steps back: Flood management policy in the United States,” *Environmental Politics*, 16 (2007): 45.

¹²⁴ Carolan, “One Step Forward,” 45.

¹²⁵ “Mapping the Zone: Improving Flood Map Accuracy,” National Academies of Sciences, 2009, accessed March 11, 2013, http://dels-old.nas.edu/dels/rpt_briefs/improving_flood_maps_final.pdf, 4.

events, such as Hurricane Katrina in New Orleans in 2005.¹²⁶ Not all properties at risk of flooding carry flood insurance, and pre-FIRM properties are given subsidized rates, which reduces the fiscal health of the insurance program. Burby cites four studies showing that only about 20% of properties required to carry flood insurance actually do so.¹²⁷ Market penetration for flood insurance is only 26%. In 2000, 4.4 million properties were insured, covering \$568 billion of assets with premiums of \$1.7 billion.¹²⁸ However, the payouts for Hurricane Katrina alone were \$16.1 billion, and the NFIP has been in debt to the US Treasury since that event.¹²⁹

Providing insurance to build in a hazardous area creates a moral hazard by removing some portion of risk from the investment. NWF points out that over 700 homes in Puget Sound have been repeatedly rebuilt after flood damage, which is allowed under the NFIP.¹³⁰ One of the central issues in this debate is whether the NFIP creates a moral hazard by encouraging development in the floodplain. This question has been answered to varying degrees with various methods of proof during the creation of the biop. In the 2004 case requiring the consultation for the biop, the court cited FEMA and congressional documents to demonstrate that the NFIP encouraged development in floodplain.¹³¹ In the 1994 case the NWF filed on behalf of Key Deer in Florida, the court declared it moot, but pointed to testimony from people involved in development in Florida.¹³² A review by Evatt of 35 studies of the effect of insurance available under the NFIP on development concluded that there is insufficient evidence to say that the NFIP

¹²⁶ E. Michel-Kerjan, "Catastrophe Economics: The National Flood Insurance Program," *The Journal of Economic Perspectives*, 24 (2005): 176.

¹²⁷ Raymond Burby, "Flood Insurance and Floodplain Management: the US experience," *Environmental Hazards* 3 (2001): 118.

¹²⁸ Ibid.

¹²⁹ Michel-Kerjan, "Catastrophic Economics," 176.

¹³⁰ "Protecting Puget Sound Floodplains," National Wildlife Federation, accessed March 11, 2013, http://online.nwf.org/site/DocServer/FP1pager_5.3.10_EM-Dan_rc3_EM.pdf?docID=13461.

¹³¹ NWF v FEMA, 1157-1158.

¹³² Key Deer vs Stickney.

encourages growth in floodplains.¹³³ The difficulty of proving causation between the NFIP and development is exacerbated by a number of confounding factors. Development in floodplains certainly has continued after the program began in 1968, but may be attributed also to investment in infrastructure in floodplains and a population shift to areas with greater risk of coastal and inland flooding that began before 1968.¹³⁴ Additionally, communities experiencing high growth are more likely to sign up for the NFIP, which is designed to regulate new development, not control existing development, creating a selection bias of enrolled communities.¹³⁵ Some data indicate that floodplain development was less likely to be hampered by regulations in high-amenity coastal areas than in lower-income areas.¹³⁶

FEMA has been gathering information and public input on how to address many of these issues with the NFIP for over a decade, as part of “Rethinking the NFIP”.¹³⁷ The reform process was formalized in 2009 with a stakeholder Listening Session as Phase I. Phase II was the formation of the NFIP Reform Working Group in 2010, which developed guiding principles and evaluation criteria for potential alternatives to the NFIP. By June 2011, this group had identified and evaluated policy alternatives to the NFIP, and is currently in the process of creating a consensus recommendation for a new approach to flood insurance in the US.

¹³³ Dixie Ship Evatt, “Does the National Flood Insurance Program drive floodplain development?,” *Journal of Insurance Regulation*, 18 (2000): 497.

¹³⁴ Evatt, “Does the NFIP drive floodplain development?,” 506.

¹³⁵ Raymond Burby and Steven French, “Coping with Floods: The Land Use Management Paradox,” *American Planning Association Journal* July(1981): 291.

¹³⁶ Evatt, “Does the NFIP drive floodplain development?,” 507.

¹³⁷ Federal Emergency Management Agency, “Rethinking the NFIP,” accessed March 11, 2013, http://www.floods.org/ace-files/documentlibrary/FEMA/FEMA_Rethinking_NFIP.pdf.

Local Government Regulation of Floodplains

Thirty-nine counties, 200 cities and towns, and two tribal reservations participate in the NFIP in Washington.¹³⁸ Local governments also are the main bodies implementing the NFIP, due to their control over land use regulations. Ninety percent of local governments with floodplain lands in their jurisdiction participate in the NFIP.¹³⁹ The majority of NFIP participating communities that have urban growth boundaries designated under the Growth Management Act (GMA) include floodplain land in those boundaries.¹⁴⁰

Local governments have land use control over their jurisdictions, as well as the responsibility of complying with Washington's GMA and Shoreline Management Act (SMA). The GMA, adopted in 1991, requires jurisdictions with a population of fifty thousand or above and a growth rate above 17% for the last ten years, or with a growth rate above 20% in the past ten years, to prepare comprehensive land use plans.¹⁴¹ Among the required elements of the comprehensive land use plan is the designation of critical areas. Critical areas are defined as areas including fish and wildlife habitat conservation areas, frequently flooded areas, aquifer recharge areas, geologically hazardous area, and wetlands.¹⁴² Since 1995, communities have been required to protect the function and values of critical areas using "Best available science".¹⁴³

The SMA, enacted in 1971, requires local governments to create Shoreline Master Programs (SMP) guiding development and land use along shorelines of state significance, marine waters,

¹³⁸ NMFS, Biological Opinion, 6.

¹³⁹ Puget Sound Partnership. "Floodplain Management: A Synthesis of Issues Affecting Recovery of Puget Sound," July 2010, accessed August 25, 2012, http://www.psp.wa.gov/vitalsigns/documents/Floodplain_Management_Report%20Judge%20Final-July%202010.pdf, 9.

¹⁴⁰ NMFS, Biological Opinion, 4.

¹⁴¹ Puget Sound Partnership, "Floodplain Management," A-6.

¹⁴² Puget Sound Partnership, "Floodplain Management," A-5.

¹⁴³ Municipal Research and Services Center of Washington, "Critical Areas," accessed March 11, 2013, <http://www.mrsc.org/subjects/environment/criticalpg.aspx>.

rivers, some larger streams and lakes, reservoirs, and certain wetlands and river deltas, and extends landward 200 ft. from these water bodies.¹⁴⁴ Many communities in the region are almost due to update their SMPs for the first time since the 1970s.^{145,146} SMP are held to a “no net loss” standard of shoreline function.¹⁴⁷ “No net loss” standards are in contrast to “no adverse impact” standards of environmental management set forth in RPA 3, Option 2.¹⁴⁸ Under “no net loss”, habitat area may be damaged or lost as long as those losses are mitigated, for example by providing habitat in a constructed wetland elsewhere. “No adverse impact” (NAI) standards were developed by the Association of State Floodplain Managers (ASFPM). Under NAI, no actions in the floodplain are taken that would adversely impact the rights of other property owners both in and out of the floodplain, including actions that would increase flood peaks, cause erosion or sedimentation, or damage habitat.¹⁴⁹ NAI standards may include mitigation, but they are considered to be more stringent than “no net loss” standards.

The responsibilities, goals, and requirements of the GMA critical areas, SMPs, and NFIP may overlap, but communities are responsible to different organizations for maintaining and updating these programs through different processes and on different timeframes.

¹⁴⁴ Puget Sound Partnership, “Floodplain Management,” A-6.

¹⁴⁵ Ibid., A-7.

¹⁴⁶ “Shoreline Management Programs (SMPs): Comprehensive Updates,” Washington State Department of Ecology, accessed March 11, 2013, <http://www.ecy.wa.gov/programs/sea/shorelines/smp/status.html>.

¹⁴⁷ Puget Sound Partnership, “Floodplain Management,” A-7.

¹⁴⁸ NMFS, Biological Opinion, 183.

¹⁴⁹ “Association of State Floodplain Managers NAI- No Adverse Impact Floodplain Management,” Association of State Floodplain Managers, accessed March 11, 2013, <http://www.floods.org/index.asp?menuID=349&fir>.

Washington State Regulation of the Floodplains

Washington has been regulating development in the floodplains since 1935, when Flood Control Zones were designated and construction permits in them were put under state control.¹⁵⁰ In 1969, the state legislature prohibited the construction of residential structures in floodways.¹⁵¹ After floodplains were mapped through the NFIP in the 1970s and 1980s, Washington began to rely on these maps instead of the designated Flood Control zones.¹⁵² When the state Department of Ecology, which administered the state floodplain management program, was authorized to establish minimum floodplain management rules, their regulations exceeded the FEMA NFIP minimum standards by prohibiting development in coastal high hazard areas, and requiring buildings to be elevated to a foot above the mapped BFE, or level of a 100-year flood event.¹⁵³ By 1989, however, the legislature pushed back against these development restrictions, and stripped the DOE of the power to create state floodplain management standards that exceeded the minimum federal standards found in the NFIP.¹⁵⁴ These restrictions remain in effect.^{155,156} Local governments could set more stringent standards, however, and under state law were still required to prohibit the new construction, substantial improvement, or reconstruction of residences built in the floodway.¹⁵⁷ In 1999, the legislature again loosened the rules to make the restrictions on residential properties in the floodway not apply to certain existing farmhouses or other structures, depending on an assessment by the DOE.¹⁵⁸ The state also distributes funding for planning and

¹⁵⁰ Washington State Department of Ecology, "Floodplain Management in the State of Washington: A Status Report as of February 2004," Publication #04-06-016, March 2004, accessed March 11, 2013, <https://fortress.wa.gov/ecy/publications/publications/0406016.pdf>, 1.

¹⁵¹ Ibid.

¹⁵² Ibid., 2.

¹⁵³ Ibid.

¹⁵⁴ Ibid.

¹⁵⁵ Shorin Interview.

¹⁵⁶ NWF Interview.

¹⁵⁷ Department of Ecology, "Floodplain Management," 3.

¹⁵⁸ Ibid.

projects dealing with flood hazards called the Flood Control Assistance Account Program (FCAAP).¹⁵⁹

The DOE also implements Section 401 of the federal Clean Water Act, giving it the ability to regulate actions in floodplain wetlands.¹⁶⁰ It also approves local Shoreline Master Programs, which gives it the ability to influence local government implementation of the Shoreline Management Act, which has some regulatory control of floodplains.¹⁶¹

Besides the DOE, there are many other state agencies that deal with floodplain regulations, and the changes in approach socially and politically are changing which departments are involved with floodplain management.¹⁶² The Division of Emergency Management offers funding and technical assistance for mitigation and recovery of disasters, including flooding.¹⁶³ The Department of Fish and Wildlife offers permits for work that effects stream flows through the State Hydraulic Code, and assists the DOE in protecting floodplain, riparian, and wetland areas.^{164,165} The Community, Trade, and Economic Development Local Government Division administers the Growth Management Act, including the Critical Areas Ordinances which designate the Fish and Wildlife Habitat Conservation Areas.¹⁶⁶ The Washington State Department of Transportation (WSDOT) has technical and financial resources for mapping and modeling of floodplains.¹⁶⁷

¹⁵⁹ Ibid.

¹⁶⁰ Puget Sound Partnership, "Floodplain Management," 9.

¹⁶¹ Ibid.

¹⁶² Department of Ecology, "Floodplain Management," 5.

¹⁶³ Ibid.

¹⁶⁴ Puget Sound Partnership, "Floodplain Management," 9.

¹⁶⁵ Department of Ecology, "Floodplain Management," 5.

¹⁶⁶ Ibid., 6.

¹⁶⁷ Ibid.

The DOE is the State Coordinating Agency for the NFIP. In this capacity, DOE assists FEMA with the State Support Services Element of the Community Assistance Program. DOE assists with the CAC and CAV for the NFIP. In 2004, DOE had performed CAVs in 42 communities, while FEMA performed eight.¹⁶⁸ In the five-year cycle ending in 2004, almost every community with a detailed flood study had received a CAV.¹⁶⁹ Washington also assists FEMA with its map modernization effort.¹⁷⁰

Salmon in Puget Sound

The biop covers the populations and critical habitat of four Pacific salmon species, the Puget Sound Chinook (*Oncorhynchus tshawytscha*), Puget Sound Steelhead (*O. mykiss*), Hood Canal Summer Run chum (*O. keta*), and Lake Ozette Sockeye (*O. nerka*), as well as the Southern Resident Killer Whales (*Orcinus orca*). Those four listed salmonids are the only ones residing in the action area considered by this biop.¹⁷¹ Pacific salmon (genus *Oncorhynchus*) are a distinct species from Atlantic salmon (*Salmo salar*), and are mostly anadromous fish, which grow to maturity in marine waters, but spawn in freshwater.¹⁷²

A diagram of the salmon lifecycle is shown in Figure 2.4. Mature salmon preparing to spawn stop feeding and swim up river to return to the place of their birth.

¹⁶⁸ Ibid., 8.

¹⁶⁹ Puget Sound Partnership, "Floodplain Management," 8.

¹⁷⁰ Ibid.

¹⁷¹ NMFS, Biological Opinion, 22.

¹⁷² Taylor, *Making Salmon*, 5.

Salmon eggs incubate in their mothers for about two months and are laid on a secure rocky substrate. Alevin, the newly-hatched salmon, hide while they consume the nutrients from those eggs' sacs.¹⁷³ At four to six weeks old, the alevin reach the fry stage, and, depending on the species, begin migrating to the ocean or to other freshwater streams and lakes during their juvenile years. Chinook and

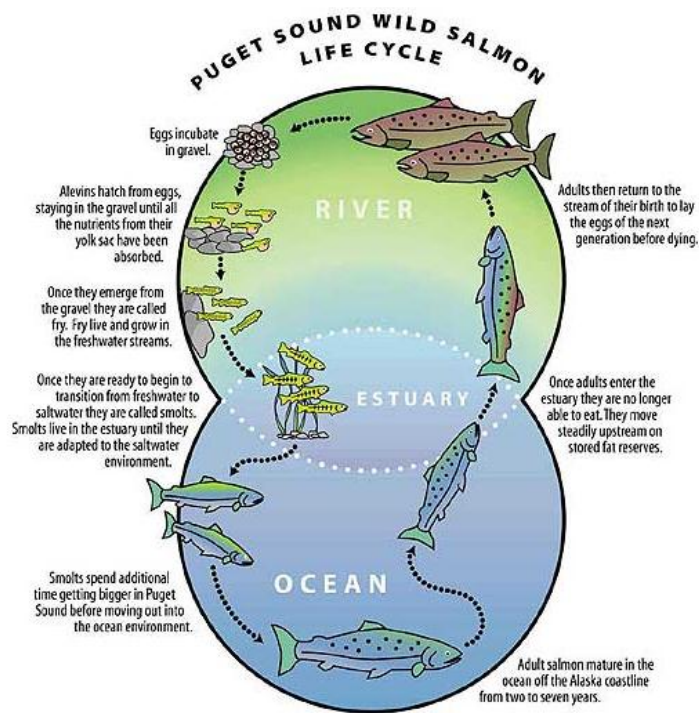


Figure 1.4: Salmon Lifecycle

Source: GIS and Visual Communication Unit, King County Department of Natural Resources

steelhead rely on floodplains during juvenile life stages.¹⁷⁴ Chum salmon spawn in floodplains.¹⁷⁵ Sockeye do not rely greatly on floodplains.¹⁷⁶

When salmon begin migrating to the ocean, they undergo the physical changes of smoltification to allow them to survive in salt water, including the development of scales and altered blood chemistry.¹⁷⁷ Some species of salmon remain in freshwater their entire lives. Salmon leave

¹⁷³ Taylor, *Making Salmon*, 5.

¹⁷⁴ NMFS, Biological Opinion, 22.

¹⁷⁵ Ibid.

¹⁷⁶ Ibid.

¹⁷⁷ Taylor, *Making Salmon*, 5.

feeding grounds and live off body fat reserves to swim upriver to their birthplaces to spawn. The physical toll of this journey causes almost all salmon to die after spawning once.¹⁷⁸

Although salmon life cycles depend on surviving rigorous migrations from rivers to the ocean then back into rivers to spawn, salmon require a specific set of habitat conditions to survive each segment of the life cycle. Attributes necessary for salmon habitat include appropriate water quality, appropriate water velocity, temperature, gravel or cobble substrate appropriate for spawning, presence of zooplankton, aquatic invertebrates or smaller fish for food, water quantity and connectivity to allow foraging and migration, and natural cover such as shade, large woody debris, vegetation, rocks, beaver dams, side channels, and undercut bank for shelter from predation.^{179,180} Cold water with little suspended sediment is necessary for salmon of all developmental stages.¹⁸¹ Estuarine areas are necessary to change form in migration from fresh to saltwater.¹⁸² Salmon require different types of habitat area with different food during different life stages. Floods connect main river channels to wetland areas which contain these functions, and floodplains also offer many of these habitat conditions, including shelter from predation and food sources.¹⁸³ Complex river systems, with wetlands, estuaries, oxbows, and off-channel areas have more of these habitat areas. The designated critical habitat areas of Hood Canal Chum, Puget Sound Chinook, and Lake Ozette Sockeye are shown in Figure 2.5.

¹⁷⁸ Taylor, *Making Salmon*, 6.

¹⁷⁹ NMFS, Biological Opinion, 24.

¹⁸⁰ *Ibid.*, 45.

¹⁸¹ *Ibid.*, 24.

¹⁸² *Ibid.*, 45.

¹⁸³ *Ibid.*, 55, 100.

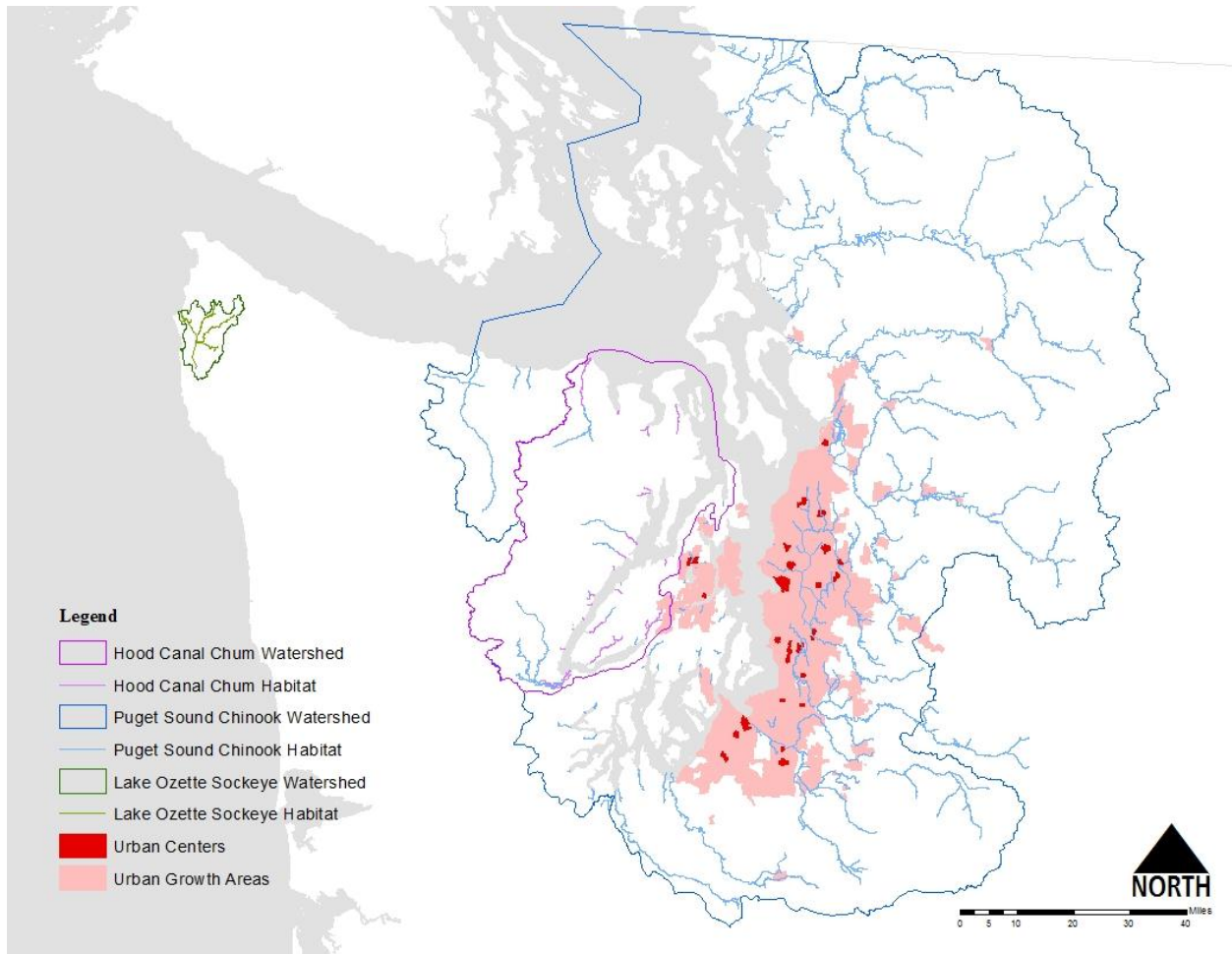


Figure 1.5: Designated Critical Habitat of Threatened Salmon Species

Source: Map by author.

The biop uses the criteria of a Viable Salmonid Population (VSP) to determine the level of risk of extinction of a species. VSP have a negligible risk of extinction, as judged by whether they contain multiple, geographically spread populations, some large and productive populations, some connections between populations, and populations with a diverse life history and phenotype.¹⁸⁴ These conditions would allow VSPs to survive catastrophic events while maintaining genetic diversity.

¹⁸⁴ Ibid., 24.

In 2005, critical habitat areas for Puget Sound Chinook, Hood Canal Summer Run chum, and Lake Ozette Sockeye were designated.¹⁸⁵ Around Puget Sound, water resources are managed in watershed units called Water Resource Inventory Areas (WRIAs). A map of WRIAs is shown in Figure 2.6. Basins in each WRIAs with this critical habitat included were ranked by the amount of support they provide to listed salmon species by Critical Habitat Area Review Teams.¹⁸⁶ These teams evaluated the quality and quantity of available habitat, and the location of the area and significance of the local population in relation to each evolutionarily significant unit (ESU), or genetically different fish population, then ranked WRIAs into three tiers.¹⁸⁷ WRIAs with poor quality habitat could be marked as important conservation areas if they had features, however degraded, important to the survival of significant populations.¹⁸⁸ Critical habitat for Puget Sound Steelhead still has not been designated, though it has been proposed.¹⁸⁹

¹⁸⁵ Ibid., 46.

¹⁸⁶ Ibid., 22.

¹⁸⁷ Ibid.

¹⁸⁸ Ibid.

¹⁸⁹ “Fisheries Data: Critical Habitat,” NOAA Fisheries, accessed March 11, 2013, <http://www.nmfs.noaa.gov/gis/data/critical.htm>.

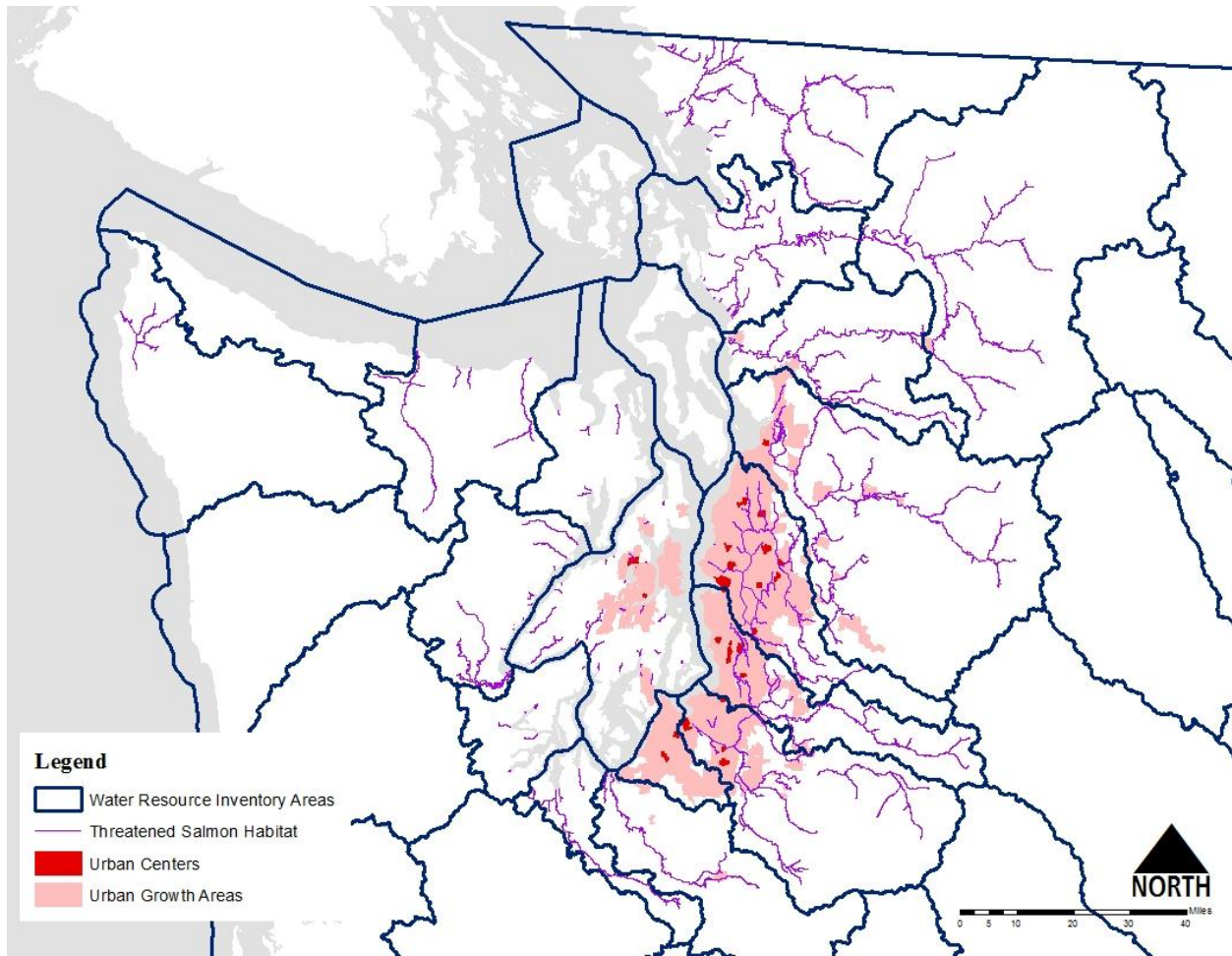


Figure 1.6: Water Resource Inventory Areas

Source: Map by author.

These designations concluded that all critical habitat designated for these species have been degraded by loss of shoreline habitat, floodplain and off-channel habitat, estuarine habitat, quality, and competition with invasive species.¹⁹⁰ The factors influencing Puget Sound Chinook salmon are attributed to effects of development, both urban and agricultural, on their habitat. Changes include altered hydrological flow regime, increased sedimentation, increased water temperatures, streambed instability, the loss of estuaries and large woody debris, and blockage of

¹⁹⁰ NMFS, Biological Opinion, 51.

fish migration by dams or other structures.¹⁹¹ Chum salmon are faced with both harvest and habitat loss, which is also the main problem for steelhead populations.^{192,193}

Of the rated Water Resource Inventory Areas (WRIAs), 71% had generally poor floodplain conditions, on a scale of good-good/fair-fair-fair/poor-poor.¹⁹⁴ Only 12% had good ratings.¹⁹⁵ All of the areas that rated good or fair were 65% forested basins.¹⁹⁶ Less than 10% of the historic wetland area in the lowland Puget Sound remain intact, and historic channelization of rivers for navigation and flood control contributed to this loss of habitat area and connections to habitat area.^{197,198} Other river alterations for flood control, including diking, dredging, hardening river banks, construction of dams, and clearing of logs also contributed to loss of habitat area.¹⁹⁹

The Southern Resident Killer Whale (SRKW) is a species of whale that eats salmon, among other things.²⁰⁰ SRKWs will not be discussed in detail in this research, though they were also determined to be jeopardized, and to have their existing habitat adversely modified, by the NFIP in this biop.²⁰¹ Development in the Puget Sound region affects their food sources. Studies have shown that SRKWs prefer Chinook salmon as a food source, though they will also eat chum and other species of salmon.²⁰² Several studies have shown that salmon consists of over 90% of the SRKW diet during spring, summer, and fall.²⁰³

¹⁹¹ Ibid., 27.

¹⁹² Ibid., 28.

¹⁹³ Ibid., 30.

¹⁹⁴ Ibid., 58.

¹⁹⁵ Ibid.

¹⁹⁶ Ibid.

¹⁹⁷ Ibid., 59.

¹⁹⁸ Ibid.

¹⁹⁹ Ibid.

²⁰⁰ Ibid., 37.

²⁰¹ Ibid., 149.

²⁰² Ibid., 37.

²⁰³ Ibid.

Salmon have been a dietary and cultural staple in the Puget Sound region since Native American tribes settled the region. Salmon were fished and traded, and were an important part of the cultural life for tribal communities.²⁰⁴ When tribes signed the 1854 and 1855 Stevens-Palmer treaties with the US Government in what would become Washington and Oregon, they retained the rights to fish at “all usual and accustomed places.”²⁰⁵ Native Americans and settlers clashed over these fishing rights for over a century, as native fishing was blamed for dwindling catches, and tribe members were arrested at fish-ins in the 1960s and 1970s.^{206,207} After a police raid of a fish-in in 1970, the federal government filed a case against the state of Washington alleging that the limitations on tribal fishing were not in the interests of conservation, and did not allow tribal entities to a fair and equitable share of fish.²⁰⁸ Judge Boldt ruled in favor of the tribes, and determined that a fair and equitable share of the fish stocks, as required under the treaty rights of these tribes, was half of the fish catch not necessary for spawning.²⁰⁹ This ruling allowed some tribal entities to regulate their own fishing, and required state agencies to coordinate with tribal governments in monitoring fishing in the state. The ruling was upheld by the Supreme Court in 1979.²¹⁰ Decline of salmon species in Washington makes it more difficult for the state to meet these treaty obligations.

After species of salmon were listed as threatened in 1999, NMFS began development of salmon recovery plans (SRP), as required under the ESA. In Puget Sound, the Shared Strategy program

²⁰⁴ Taylor, *Making Salmon*, 24-25.

²⁰⁵ Fronda Woods, “Who’s In Charge of Fishing,” *Oregon Historical Quarterly*, 106 (2005): 412.

²⁰⁶ Lynda Mapes, “Tribes: Hard-won fishing rights here worthless without fish,” *Seattle Times*, January 5, 2013, accessed March 11, 2013, http://seattletimes.com/html/othersports/2020068220_fish06m.html.

²⁰⁷ Coll Thrush, *Native Seattle: Histories from the Crossing Over Place* (Seattle: University of Washington Press, 2007), 189-190.

²⁰⁸ Woods, “Who’s in Charge of Fishing?,” 427.

²⁰⁹ Thrush, *Native Seattle*, 190.

²¹⁰ Walt Crowley and David Wilma, “Federal Judge George Boldt issues historic ruling affirming Native American treaty fishing rights on February 12, 1974,” *Historylink.org* Essay 5282, February 23, 2003, http://www.historylink.org/index.cfm?DisplayPage=output.cfm&File_Id=5282.

was created, which relied on bottom-up development of salmon management and recovery plans based around WRIAs.²¹¹ Private citizens, local governments, policy makers, tribes, state agencies, federal agencies, and technical experts were included in the drafting of these documents, which set out specific restoration projects and measureable recovery goals. These SRPs, currently available for Puget Sound Chinook, Hood Canal Summer Run Chum, and Lake Ozette Sockeye, were finalized in 2007 as NMFS's official SRPs.²¹² The Puget Sound Partnership (PSP), a regional government body, now oversees the funding, monitoring and implementation of these SRPs. While the SRPs include floodplain management criteria and floodplain restoration projects as part of the necessary work for recovery of the listed species, none of the documents engaged the NFIP as a crucial regulator of development in floodplains.²¹³ In the biop, the negative effects of NFIP-regulated development on specific SRP efforts are described in detail.²¹⁴

In Puget Sound, there are already multiple layers of regulation surrounding floodplain management and endangered species habitat. In a few instances, such as the SRPs, these regulatory efforts overlap, but the biop was the first federal effort to mitigate the impacts of the NFIP on salmon in the region.

²¹¹ "Puget Sound Chinook Recovery Plan," NOAA Fisheries, accessed March 11, 2013, http://www.nwr.noaa.gov/protected_species/salmon_steelhead/recovery_planning_and_implementation/puget_sound/puget_sound_chinook_recovery_plan.html.

²¹² "Salmon Recovery in Puget Sound," Puget Sound Partnership, accessed March 11, 2013, http://www.psp.wa.gov/SR_status.php.

²¹³ Shorin Interview.

²¹⁴ NMFS, Biological Opinion, 130.

Theoretical Frameworks

Implementation

The effectiveness of a regulation depends on the success of an implementation program designed for it. Implementation includes the design of a program to implement a policy as well as the actual way that policy is put into action.²¹⁵ In this biop process, multiple implementation plans were created. The RPA elements in the biop included directions and a timeframe for how they were to be implemented. FEMA created 3 implementation options to satisfy the requirements of the RPA elements. Each of 122 communities also had to determine their own process for implementation as well. Two of the options created by FEMA, the model ordinance of door 1 and the permit-by-permit approval of door 3, simplified the community implementation design. Implementation of Door 2, however, which required communities to show how their existing regulations met the requirements of the biop through FEMA's checklist, and to potentially adopt new regulations, became a unique process in each community that selected it.

The search for a useful implementation framework yielded an embarrassment of riches. Studies yielded numerous variables for consideration.²¹⁶ Since this research attempts to explain how these implementation programs were designed and how they are operate now that the compliance deadline has passed, several basic frameworks have been selected for their explanatory power, and their lack of reliance on multiple datasets. More recent implementation theory work has focused on larger sets of data gathered over a period of time.²¹⁷ Despite the potential data available from 122 communities attempting to implement the same regulation, these methods are not practical due to the limited amount of actual data collected by FEMA on how these programs

²¹⁵ Lawrence J. O'Toole, "Research on Policy Implementation: Assessment and Prospects," *Journal of Public Administration Research and Theory* 10 (2000): 266.

²¹⁶ O'Toole, "Research on Policy Implementation," 268.

²¹⁷ Jill Schofield, "Time for a revival? Public policy implementation: a review of the literature and an agenda for future research," *International Journal of Management Reviews* 3 (2001): 249-250.

are being implemented in each jurisdiction, in the short timespan since each community has been required to be in compliance.

Top Down or Bottom Up?

‘Top-down’ ideas of implementation see implementation as following from a centrally determined policy, and have been criticized for not considering the ‘pre-legislative phase of policy making’, adhering to a rationalist model of government, and seeing bureaucrats as subverting the primary or ‘true’ policy goal.²¹⁸ ‘Bottom up’ implementation research focuses on local implementation, differentiates the policy from the problem which it addresses, and have been critiqued for their dependence on the norms of the researcher pursuing them, and the complexity of the issues they can reveal, making comparisons between them difficult.²¹⁹ Bottom-up methods have also been criticized for neglecting the importance of central policy makers as actors in the process.²²⁰ Schofield notes the difficulty of gathering data on the motivations of actors, especially elected officials, or determining the key players among the elected officials and civil servants dealing with an issue, at any level of policy implementation.²²¹ The structure delivering the implementation can make a difference in the design and success of the process.²²² Bureaucratic discretion, especially at the ‘street-level’, can play a large role when a ‘top-down’ or central policy directive is not well-defined.²²³

²¹⁸ Schofield, “Public Policy Implementation,” 250-251.

²¹⁹ *Ibid.*, 251.

²²⁰ *Ibid.*

²²¹ *Ibid.*

²²² *Ibid.*, 252.

²²³ *Ibid.*, 256.

Implementation in Bardach's Terms

In addition to the insight offered by the 'top-down' and 'bottom-up' distinctions in implementation processes, Eugene Bardach created a typology of the interactions involved in an implementation process. He describes four types of detrimental games that occur in implementation processes, including diversion of resources games, deflecting goals games, dilemmas of administration games, and dissipation of energy games. These games are summarized in Table 1.1. Bardach compares the creation of an implementation program to the assembly of a machine. Parts may be reused or newly-fashioned and may be assembled by multiple groups of people.²²⁴ He claims that the politics of implementation processes are typically defensive politics, and involve maneuvering to avoid 'responsibility, scrutiny, and blame.'²²⁵

Table 1.1: Bardach's Implementation Games

Type of Game	Variations
Diversion of Resources	Easy Money Budget Easy Life Pork Barrel
Deflecting Goals	Piling On Up for Grabs Keeping the Peace
Dilemmas of Administration	Tokenism Massive Resistance Social Entropy
Dissipation of Energy	Tenacity Territory Not Our Problem Odd Man Out Reputation

²²⁴ Eugene Bardach, *The Implementation Game: What Happens After a Bill Becomes a Law* (Boston: MIT Press, 1977), 36-37.

²²⁵ Bardach, *Implementation Game*, 37.

Diversion of Resource games include the Easy Money game, which involves the use of complex government policies and contracts that maximize the flow of money from government to private groups, a legal form of corruption.²²⁶ The Budget Game is based on the principle that it is in the interest of government agencies to move money quickly to retain their budget sizes, and justify higher budgets, even at the cost of programmatic objectives, which tends to give funding to projects that are ‘ready-to-go’, not necessarily the best.²²⁷ The Easy Life Game may be played by bureaucrats, who may wish to organize their work environments to suit themselves, given their power relative to the public in need of their services.²²⁸ The Pork Barrel game may be played by elected officials placing the interests of their constituents above the interests of the implementation plan overall.²²⁹

Deflecting Goals games happen when there is a weak consensus or opposition emerges after initial stages of implementation.²³⁰ The Piling On game happens when too many goals are added to the process, especially after an initial success.²³¹ This game can dissipate existing coalitions with differing goals.²³² The Up For Grabs game occurs when goals are ambiguous and programs are hijacked.²³³ Regulatory capture is also a function of the up for grabs game, when regulated industries or groups end up influencing the agency that regulates them.²³⁴ The Keeping the Peace game is a balancing act between differing extremist groups that make demands of an

²²⁶ Ibid., 69.

²²⁷ Ibid., 72.

²²⁸ Ibid., 76.

²²⁹ Ibid., 77.

²³⁰ Ibid., 85.

²³¹ Ibid.

²³² Ibid., 89.

²³³ Ibid., 90.

²³⁴ Ibid., 92.

implementation process, which is then watered down to appease, or at least not offend, both sides.²³⁵

Dilemmas of Administration games are played by or with central agencies responsible for implementation programs.²³⁶ The Tokenism game occurs when an agency appears to publically put together an implementation program, but in reality is only doing a small part of it.²³⁷ The Massive Resistance game is played by overwhelming the capacity to deal with non-compliance.²³⁸ The Social Entropy game is one where implementation is run down by general forces of incompetence, lack of coordination, and disparate kinds of control.²³⁹

The fourth set of games is the Dissipation of Energy games, linked by their tactics of defensive maneuvering and avoidance of responsibility, and resulting in delay.²⁴⁰ The Tenacity game is one that involves frustrating the program's process until one's own terms are met, which leads to delay and may kill the program.²⁴¹ The Territory game is played among groups with overlapping jurisdictions who want to preserve their own processes.²⁴² For implementation programs that will impose heavy workloads, get into controversial territory, or require expertise beyond the agency's capability, the Not-Our-Problem game is played.²⁴³ The Odd Man Out game involves participants trying to cut their losses in complicated processes where success depends on other participants fulfilling their own roles.²⁴⁴ The Reputation game is an intra-bureaucratic personality

²³⁵ Ibid., 93.

²³⁶ Ibid., 98.

²³⁷ Ibid., 98.

²³⁸ Ibid., 108.

²³⁹ Ibid., 125.

²⁴⁰ Ibid., 148.

²⁴¹ Ibid.

²⁴² Ibid., 151.

²⁴³ Ibid., 159.

²⁴⁴ Ibid., 163.

game, played by entirely human people with different personality types attempting to work together on a complicated issue.²⁴⁵

The implementation process created from the biop by FEMA and in both case studies will be examined in light of these theoretical frameworks for describing implementation. The ‘top-down’ and ‘bottom-up’ assessments, as well as the descriptions of Bardach’s games, will be used to analyze the informational and case study interviews. Bardach’s language of ‘games’ does not necessarily denote a zero-sum game, which may be won only at the expense of the other players; these games may be played without necessarily degrading outcomes for other players.

Regulation Design

As a national agency, FEMA has a responsibility to comply with the ESA in the implementation of the NFIP. The biological opinion created a set of regulatory standards that clarified what standards the NFIP, FEMA Region X, and local communities need to enact in order to be in compliance with the ESA, and has the effect of a required permitting process.²⁴⁶ The biological opinion is not a straightforward regulation, since it set forth standards to be implemented by other groups without providing specific regulatory language and without spelling out a specific administrative or legislative process for adoption. However, the biop does assemble the elements of a regulatory program applicable to Bardach’s typologies.

Bardach’s typology of implementation presupposes a defined regulation program, such as the biop.²⁴⁷ The strength and effectiveness of regulations may influence their implementation

²⁴⁵ Ibid., 168.

²⁴⁶ Shorin Interview.

²⁴⁷ Bardach, *Implementation Game*, 57.

processes, as ‘strong’ regulations will tend to a top-down implementation, and ‘weak’ regulations may be susceptible to bottom-up influence during their implementation. Qualities of the regulation design may influence what games are played in its implementation.

If the principles of drafting effective regulations were fully understood, governance would be a simpler process. However, there are some basic principles for judging the value and effectiveness of a regulation. The Organization for Economic Cooperation and Development (OECD) has a mission to promote policy design that enhances economic and social well-being, and has been studying policy and regulatory design since 1961.²⁴⁸ Regulation is a rule-making process that enforces policy statements. In 1995, the OECD defined “good regulation” principles, based on whether the regulations can

“(i) serve clearly identified policy goals, and be effective in achieving those goals; (ii) have a sound legal and empirical basis; (iii) produce benefits that justify costs, considering the distribution of effects across society and taking economic, environmental and social effects into account; (iv) minimise costs and market distortions; (v) promote innovation through market incentives and goal-based approaches; (vi) be clear, simple, and practical for users; (vii) be consistent with other regulations and policies; and (viii) be compatible as far as possible with competition, trade and investment-facilitating principles at domestic and international levels.”²⁴⁹

These principles are based on studies of regulatory policy in OECD member countries, and recommendations for reform made by the OECD Regulatory Reform group.²⁵⁰

The OECD offers a set of seven “Guiding Principles for Regulatory Quality and Performance”, shown in Table 1.2.²⁵¹ By reviewing the contents of the biop RPA, and the regulation changes in the FEMA implementation program, according to these seven principles, the expected strength and effectiveness of the biop regulations may be estimated. This particular set of principles may

²⁴⁸ “The Organisation for Economic Co-operation and Development (OECD),” Organisation for Economic Co-operation and Development, accessed March 11, 2013, <http://www.oecd.org/about/>.

²⁴⁹ “OECD Guiding Principles for Regulatory Quality and Performance,” Organisation for Economic Co-operation and Development, accessed March 11, 2013, <http://www.oecd.org/fr/reformereg/34976533.pdf>.

²⁵⁰ “Tools and Practices,” Organisation for Economic Co-operation and Development, accessed March 11, 2013, <http://www.oecd.org/gov/regulatorypolicy/toolsandpractices.htm>.

²⁵¹ “OECD Guiding Principles for Regulatory Quality and Performance”.

be a useful measure of effectiveness because they are broad, and address the spectrum of regulation design, including development, implementation, and review. While these principles focus on social and economic purposes, they do not preclude environmental purposes of regulation. They are useful principles for reviewing the regulatory design for the biop because, while the NMFS process had an environmental purpose, the biop also has social and economic consequences. Social and economic purposes may complement or impede the effective implementation of environmental regulation.

Table 1.2: OECD Guiding Principles for Regulatory Quality and Performance

1. Adopt at the political level broad programmes of regulatory reform that establish clear objectives and frameworks for implementation.
2. Assess impacts and review regulations systematically to ensure that they meet their intended objectives efficiently and effectively in a changing and complex economic and social environment.
3. Ensure that regulations, regulatory institutions charged with implementation, and regulatory processes are transparent and non-discriminatory.
4. Review and strengthen where necessary the scope, effectiveness and enforcement of competition policy.
5. Design economic regulations in all sectors to stimulate competition and efficiency, and eliminate them except where clear evidence demonstrates that they are the best way to serve broad public interests.
6. Eliminate unnecessary regulatory barriers to trade and investment through continued liberalisation and enhance the consideration and better integration of market openness throughout the regulatory process, thus strengthening economic efficiency and competitiveness.
7. Identify important linkages with other policy objectives and develop policies to achieve those objectives in ways that support reform.

Chapter Two Methodology

This thesis is a descriptive effort to illuminate a process in progress, to place it in the wider context of regulatory implementation efforts, and to provide suggestions for improving this and similar processes in the future. Data for this research was gathered from public documents and reports, academic literature, and interviews with key individuals in the development of the biological opinion and its implementation programs.

The primary documents studied were selected based on their relevance to the biological opinion, and included documents on other regional endangered species and floodplain management programs. Interviewed individuals also provided documents to review, so not all of the documents reviewed are directly available to the public. Academic studies on some of the fundamental issues at stake in this process were included to ground the primary research.

Interviews

The University of Washington Human Subjects Review Board reviewed and approved the interview contact procedures, consent forms, questions, and interview procedures. Based on the specific knowledge and stated institutional affiliations of the interview subjects, anonymity could not be assured in participation. Interview subjects were given a choice of participating as named or unnamed sources, and allowed to change that level of participation until two weeks before the final thesis was submitted. Interview subjects in both the informational interviews and case studies were given the questions in advance of the interview. They were allowed to refuse to answer submitted questions or follow-ups, to review interview transcripts and drafts of this research, and to redact information previously given. Questions were written broadly, to draw out the facts of the case as well as the goals and opinions of each group involved and each person

interviewed. Follow-up questions were asked based on the information elicited from the pre-drafted questions. All interviews took place in the offices or conference rooms of the organization or jurisdiction of the interview subjects, and lasted from one to one and a half hours. After the interviews, subjects were sent interview transcripts and drafts of the thesis for comment. Some of the interview subjects were contacted with follow-up questions via email.

For the informational interviews, individuals were selected for interviews based on their association with the instigation and development of the biological opinion and the implementation process. All subjects contacted about an informational interview agreed to participate in the research. The interview subject from the NWF declined to be listed as a named source. At NMFS, Bonnie Shorin, one of the authors of the biop from NMFS, was interviewed for her perspective. At FEMA, John Graves, the Senior NFIP Specialist for FEMA Region X and the person tasked with coordinating biop implementation for FEMA, participated in an interview.

The basic questions asked in each informational interview are listed in Table 3.1. The questions were designed to illuminate answers to the fundamental research questions in this thesis:

1. What were the intentions and goals of the groups formulating the 2008 biological opinion?
2. Has the biop implementation met these goals?
3. Why has the implementation of the biop met, or not met, the goals of the process participants?

Each interview question in Table 2.1 is intended to help answer at least one of these three questions, as indicated by the numbers following each question.

Table 2.1 Informational Interview Questions Referenced with Main Research Questions

What was your organization's involvement with the creation of the NMFS biological opinion? (1)
What was your personal involvement with the biological opinion? (1)
For NMFS: Did NMFS consider including any other sections in the biological opinion? Did NMFS consider including any other Reasonable and Prudent Alternatives in the biological opinion? (1, 3)
For NWF: Did NWF consider any other methods to change the National Flood Insurance Program besides a consultation and biological opinion under the Endangered Species Act? (1, 3)
For FEMA: Did FEMA consider any other compliance procedures than the three-door process to ensure that local jurisdictions implemented the biological opinion? Did FEMA consider the Reasonable and Prudent Alternatives reasonable and prudent? Did FEMA expect any other RPAs to be included in the biological opinion? (1, 3)
Is the biological opinion meeting its goals? (1, 2)
Does the program to implement the biological opinion designed by FEMA match the goals of the biological opinion? (2)
Does the final implementation by local jurisdictions match the goals of the biological opinion? (2)
Has your organization participated in other biological opinion cases? If so, how does that process compare to this process? (1 3)
Will the way this biological opinion has been implemented save fish habitat? (2)
Will the way this biological opinion has been implemented discourage development in floodplains in the National Flood Insurance Program? (2)
In hindsight, could the compliance process have been improved? If so, how? (3)

The case studies were chosen in an attempt to represent jurisdictional differences in planning resources and the nature of the floodplain management issues which most concerned communities. Floodplains in the City of Everett have suffered from high levels of urbanization, and members of the planning staff have been active in public discussions about the

implementation of the biop. I discussed floodplain issues and the biological opinion with members of the City of Everett staff prior to conducting this research. I also selected a larger jurisdiction with more floodplain area of higher habitat value. Snohomish County was contacted for an interview, but they did not agree to participate because of on-going compliance issues. Pierce County was then contacted for an interview, and agreed to participate. The basic interview questions for the case studies are listed in Table 2.2. As in the informational interviews, each interview question in Table 3.2 is intended to help answer at least one of these three main research questions, as indicated by the numbers following each question.

Table 2.2 Case Study Interview Questions Referenced with Main Research Questions

When did you first hear about the biological opinion? (1)
Is <place> in full compliance with the biological opinion? (2)
Describe the compliance process in <place>. (1, 2, 3)
Were any other implementation strategies considered? (1, 3)
How did <place> interact with NMFS and FEMA during the biological opinion implementation? (2, 3)
What was your involvement with the implementation of the biological opinion in <place>? (1)
Will these implementation measures save or improve fish habitat in <place>? (2)
Will these implementation measures limit floodplain development in <place>? (2)
In hindsight, could the compliance process have been improved? If so, how? (1, 2, 3)

Case studies have often been used in implementation theory to develop generalizable hypotheses.²⁵² The case study method was chosen because of a lack of a larger relevant data set, to illuminate potential variables in this process. When available, information from official

²⁵² O'Toole, "Research on Policy Implementation," 267.

documents, news stories, and third-party reports was included to provide a broader context for the two case studies in implementation by local jurisdictions.

Potential Sources of Bias and Error

Interviews of involved agency and local government staff may contain both personal and organizational biases. Individuals may not have been entirely forthcoming, or may have edited or sanitized their offered opinions. These biases may compromise the integrity of the data collected during interviews. In order to overcome the effects of these biases, the intentions of the study were completely disclosed, along with interview transcripts and drafts of the research. Interview subjects were explicitly told that they controlled what questions to answer, and to what extent they wished to participate in the interview process. Individuals consenting to be interviewed were given the option to participate confidentially or as named sources, in order to accommodate the potentially sensitive nature of the participants' current responsibilities in the process, and the ongoing litigation in the case. In addition to those trust-building measures, I had prior professional contact or referrals from professional contacts with the interview subjects, which may have aided in establishing confidence and trust. I have cross-referenced information from the interviews with published documents where available.

In 2011, I worked with the City of Everett on floodplain issues as a part of their Hazard Mitigation Plan update. I also attended conferences on the biological opinion and other floodplain management topics with almost all of the interviewees. This is a full disclosure of the past professional relationships between the researcher and interview subjects.

Chapter Three Results

Implementation Design

FEMA's initial response to the biological opinion came from their national headquarters, in an April 2009 letter from Michael Buckley, Acting Assistant Administrator of the Mitigation Directorate for FEMA in Washington, DC. The letter outlined which RPA elements FEMA would implement, though with some caveats in how: FEMA proposed developing a Habitat Conservation Plan (HCP) as an alternative to RPA 3.²⁵³ Sections of RPA 5 would not be implemented, since FEMA considered them to be outside of their agency authority. In lieu of the mitigation for development between the issuance and full compliance with the biop that NMFS has stipulated, FEMA offered to provide technical assistance on mitigation issues in RPA 6. In a second letter to NMFS in June 2009, Mark Carey, the Director of the Mitigation Division for FEMA Region X, clarified FEMA's planned implementation program, and included a timeline for compliance.²⁵⁴ This letter declined to create maps of future flooding conditions, and outlined what would become known as Doors 1 and 2 for compliance with RPA 3.²⁵⁵ Carey also listed levee guidelines of RPA 4 and RPA 5 as not implementable by FEMA, and offered only technical mitigation assistance on RPA 6.²⁵⁶ FEMA claimed that some reporting aspects of RPA 7 violated aspects of the Paperwork Reduction Act.²⁵⁷ These responses made it clear that FEMA did not intend to implement all aspects of the biop as published. Shorin at NMFS made it clear that piecemeal implementation was not an uncommon response to a biological opinion

²⁵³ Michael Buckley, Acting Assistant Administrator, FEMA Mitigation Directorate, to Barry Thom, Acting Regional Administrator, Northwest Regional Office NMFS, April 24, 2009.

²⁵⁴ Mark Carey, Director FEMA Region X Mitigation Division, to Steven Landino, Director, Washington State Habitat Division, NMFS, June 17, 2009.

²⁵⁵ *Ibid.*, 2.

²⁵⁶ *Ibid.*, 6-7.

²⁵⁷ *Ibid.*, 8.

consultation.²⁵⁸ Interviews with both NWF and FEMA indicated a tension between FEMA Region X and FEMA HQ in how the biop was to be implemented.^{259,260} FEMA indicated that FEMA HQ wanted to have the biop implemented by requiring each local government to comply with the ESA.²⁶¹ Graves at FEMA explained that part of this was because FEMA HQ did not want to create a separate set of rules for Puget Sound floodplains, in an effort to avoid regulatory takings claims in the region.²⁶²

The implementation program created by FEMA Region X, during and after these declarations of official intent by Buckley and Carey, assisted local governments in meeting the requirements of the biop in their own code by providing a model ordinance and technical assistance.²⁶³ FEMA Region X was concerned that the Higher Regulatory Standards document it had already drafted as an example of salmon-friendly floodplain management was not implementable in its current form, and redrafted it before giving it to a focus group of cities, counties, tribes for comment.²⁶⁴ FEMA Region X's main concern at this point was creating a program that local governments could implement successfully, and in providing technical assistance to make that process go smoothly.²⁶⁵ During the presentation of the draft model ordinance based on the Higher Regulatory Standards to the focus group, several communities expressed that they already had these requirements in place in existing codes, making wholesale adoption of the model ordinance an unnecessary, and unnecessarily limiting, process. This led to the development of Door 2, a checklist option that communities could use to show FEMA and NMFS exactly where the

²⁵⁸ Shorin Interview.

²⁵⁹ Ibid.

²⁶⁰ Graves Interview.

²⁶¹ Ibid.

²⁶² Ibid.

²⁶³ Ibid.

²⁶⁴ Graves Interview.

²⁶⁵ Ibid.

required ordinances were in their existing codes, to demonstrate they were in full compliance with the biop. In FEMA’s opinion, the compliance options that resulted from the focus group, including the model ordinance and checklist for the door 2 option, did not water down the requirements of the biop, it gave implementing communities more flexibility in addressing local floodplain issues.²⁶⁶

Once FEMA had determined what their compliance test was going to be, it was up to each of the 122 communities to determine their own individual implementation procedures. This second implementation process is discussed in the case study section. After the deadline for compliance passed, any community that had not been approved through Door 1 or Door 2 would be placed in Door 3, and would be required to meet the “No Adverse Impact” requirements of the biop and conduct a habitat assessment for each floodplain development permit in their jurisdiction.²⁶⁷

Each permit issued under Door 3 would be subject to review by FEMA and NMFS.

Table 3.1: Community Compliance Status as of December 2012

	Submitted	Approved
Door 1	5	5
Door 2	36	10
Door 3	81	81

²⁶⁶ Ibid.

²⁶⁷ FEMA Region X, “Compliance Options,” January 11, 2012, accessed March 11, 2013, <http://www.fema.gov/library/viewRecord.do?id=7038>, 1.

Table 3.2 Communities not yet approved (All applied through Door 2)

Bellingham	Burlington	Everett
Fife	Gig Harbor	Island County
Issaquah	Jefferson County	Kent
La Conner	Lacey	Langley
Marysville	Mountlake Terrace	North Bend
Pierce County	Redmond	Sammamish
Seattle	Sedro-Woodley	Skagit County
Snohomish County	Snoqualmie	South Prairie
Tacoma	Whatcom County	

Door 1: Model Ordinance

The Model Ordinance (MO) contained example regulatory language for floodplain management criteria that included the requirements of the NFIP, Washington state floodplain management laws, the requirements of the biological opinion, and suggested provisions to raise floodplain management standards beyond the minimum required by law. Many of the suggested provisions were actions eligible for CRS credits.²⁶⁸ Five communities have been approved under this door.

Door 2: Checklist

Since many communities already had portions of the required regulations in place to comply with the requirements of the biop, FEMA created a checklist with the requirements of the ESA as set forth in the biological opinion as well as the NFIP requirements.²⁶⁹ Only ten of the thirty-six communities that have applied for approval under this door have received notice that they are in compliance.²⁷⁰ Both case studies feature communities who have tried to design their own

²⁶⁸ FEMA Region X, “Floodplain Management and the Endangered Species Act: A Model Ordinance,” January 2012, http://www.fema.gov/pdf/about/regions/regionx/nfip_esa_faq/nfip_esa_model_ordinance_final.pdf, 2.

²⁶⁹ FEMA Region X, “Floodplain Management and the Endangered Species Act: Checklist for Programmatic Compliance,” January 2012, http://www.fema.gov/pdf/about/regions/regionx/nfip_esa_faq/nfip_eas_biological_opinion_checklist_final.pdf.

²⁷⁰ Graves Interview.

compliance program using this option. Neither community has been approved as compliant by FEMA.

Door 3: Permit by Permit

This option is currently the most-used implementation program, with 81 communities approved as complying with the biop under this door.²⁷¹ Communities who do not want to undertake Door 1 or Door 2 are required to demonstrate that each development in their floodplains complies through a habitat assessment showing ‘no net loss’ either in the short term, long term, or cumulatively, on salmon or salmon habitat.²⁷² Communities that have applied under Door 2 and have not yet been approved are currently operating under Door 3 restrictions.

Annual Reports

NMFS required FEMA to compile annual reports on specific portions of the RPA in the biop. FEMA was required to report on RPA 2, including on the results of mitigation for development that would initiate a map revision.²⁷³ Reporting was also required on the implementation of RPA 3, including tracking and reporting on development permits, the effectiveness of mitigation activities, and the status of each community in implementing the requirements of RPA 3.²⁷⁴ Reports on progress in levee vegetation standards were required in RPA 5, along with projects using money from FEMA programs to mitigate flood risk and benefit salmon.^{275,276} RPA 7 required reporting on the continuing progress of implementing the biop, and specified that changes to the RPA may be needed based on the results of these reports, depending on further

²⁷¹ Ibid.

²⁷² FEMA Region X, “Compliance Options,” 1.

²⁷³ NMFS, Biological Opinion, 152.

²⁷⁴ Ibid., 157.

²⁷⁵ Ibid., 160

²⁷⁶ Ibid., 161

consultation between NMFS and FEMA.²⁷⁷ In addition to RPA elements, FEMA was directed to report on incidental take from floodplain alteration, to determine if the NFIP was within the allowed incidental take guidelines in the biop.²⁷⁸ FEMA did not create any other mechanisms for monitoring compliance with the biop beyond these annual reports.

The 2009 Annual Report reports progress on all seven RPAs. The appendices for the report are not available on the website FEMA has set up with information about the biop compliance. The report mentions 567 permits issued in the floodplain in the Puget Sound Region during the annual reporting period, and says that only 12 of those contained an evaluation of the impacts on salmon habitat.²⁷⁹ It is not clear from the report what those impacts were, what the evaluations concluded, or whether mitigation was appropriate or performed. Both the 2009 and 2010 Annual Reports include a count of the number of floodplain structures removed using FEMA mitigation assistance funds, but are not specific about the habitat benefits of these projects. The 2010 Annual Report reports on all RPAs except RPA 1, which had been fulfilled by notifying communities of biop responsibilities in October 2008. This annual report had more details about planned workshops for communities attempting to comply with the biop. In the RPA 7 discussion, 280 floodplain development permits with 13 required habitat assessments were reported.²⁸⁰ No indication of the result of those assessments or mitigation strategies was included, though all the permits available were attached to the report as an appendix. FEMA did indicate that future reports would include an accounting of the amount of fill placed in

²⁷⁷ Ibid., 162

²⁷⁸ Ibid., 174

²⁷⁹ FEMA Region X, "2009 FEMA Region X Annual Report to NMFS," November 30, 2009, http://www.fema.gov/pdf/about/regions/regionx/2009_Annual_Report_to_NMFS.pdf, 11.

²⁸⁰ FEMA Region X, "2010 FEMA Region X Annual Report to NMFS," November 30, 2010, http://www.fema.gov/pdf/about/regions/regionx/2010_Annual_Report_to-NMFSwebFINAL.pdf, 6.

floodplains, as an indication of the rate of incidental take.²⁸¹ The information contained in the two available annual reports does not meet the reporting standards set out by NMFS in the biop.

NMFS requested some changes to the reports, which resulted in FEMA making minor alterations to the reporting form.²⁸² The Annual Report for 2011 is not yet complete, but will include data for the additional reporting standards requested by NMFS.²⁸³ The Annual Report for 2012 is not available as of March, 2013.

Response to FEMA's Implementation of the Biop

The implementation of the biological opinion was shaped by the RPAs included in the document, by the efforts of the FEMA, and by the efforts of each of the 122 local communities. The implementation program that FEMA designed was a departure from the process described by the NMFS in the RPAs. John Graves at FEMA felt this biop process and implementation program was different because it was programmatic instead of project-specific.²⁸⁴ Bonnie Shorin at NMFS felt that this implementation process did not fare better or worse than other biological opinion consultations, pointing out that there was often pushback on the RPAs of a biop. FEMA did plan to implement the biop, just not in the fashion that had been discussed in the consultation or intended by the RPAs.²⁸⁵ However, the Habitat Director for NMFS, Steve Landino, did express frustration at the reversals made by FEMA in implementing the biop to a Seattle Times reporter.²⁸⁶ The NWF found this biop implementation process to be different from other biological opinions their litigation had prompted. Instead of working from the RPAs provided by

²⁸¹ Ibid.

²⁸² Shorin Interview.

²⁸³ Federal Emergency Management Agency, "2011 FEMA Region X Annual Report to NMFS," December 21, 2011.

²⁸⁴ Graves Interview.

²⁸⁵ Shorin Interview.

²⁸⁶ Craig Welch, "Feds: New floodplain rules to go unenforced," Seattle Times, April 29, 2009, accessed March 11, 2013, http://seattletimes.com/html/localnews/2009134725_fema28m.html.

NMFS, which were written with the assumption that FEMA would use a rule-making process to change the NFIP, FEMA designed a different implementation process that would take place locally.²⁸⁷

The NWF and NMFS pointed out in interviews that FEMA did not develop full instructions on the compliance process quickly enough to be useful during the implementation.^{288,289} Everett expressed frustration about the amount of time review of their compliance document has taken.²⁹⁰ In a Seattle Times article from 2010 on the process, representatives from Auburn and Puyallup also expressed concern over the clarity of FEMA's guidance for compliance.²⁹¹ The Everett Herald reported on confusion over the requirements of the biop, as well as concern that the requirements would halt development in areas of the floodplain that were already developed, from officials in Everett and the City of Snohomish.²⁹²

The NWF has also objected to the MO on several grounds. NWF pointed out that at least one community adopted a draft version of the MO that did not contain all the requirements of the biop, but were approved as in compliance based on that draft.²⁹³ In addition, the MO does not specify a standard habitat assessment, does not adequately address cumulative impacts of floodplain development to salmon habitat, and does not contain directions on levee vegetation. The NWF also objects to the lack of monitoring and reporting required by the MO.²⁹⁴ Beyond

²⁸⁷ NWF Interview.

²⁸⁸ Ibid.

²⁸⁹ Shorin Interview.

²⁹⁰ Ervine, Gerry. Interview by author. In person. Everett, WA, September 11, 2012.

²⁹¹ Phuong Le, "FEMA drafts building rules that lessen harm to salmon," Seattle Times, August 7, 2010, accessed March 11, 2013, http://seattletimes.com/html/localnews/2012565686_floodinsurance08m.html.

²⁹² Debra Smith, "New rules to protect fish are clear as mud, cities say," The Herald, April 3, 2011, accessed March 11, 2013, <http://www.heraldnet.com/article/20110403/NEWS01/704039942>.

²⁹³ NWF Interview.

²⁹⁴ Ibid.

the annual reports of implementation progress and compiling permits from FEMA, no monitoring or reporting was required by NMFS in the biop, either, however.

Door 3, through which 81 communities have been approved, is also the set of requirements that currently apply to the 26 communities that have submitted applications under Door 2, but have not been approved. The NWF maintains that Door 3 certification and continuing compliance are not adequately monitored.²⁹⁵ While floodplain development permits issued in Door 3 communities are collected in the FEMA reporting process, NWF points out that permits have listed harm to threatened or endangered species, and have been approved.²⁹⁶ A brief in support of the second lawsuit's motion for injunction by Jan Hasselman of Earthjustice documented permits jurisdictions approved through all three doors that lacked documentation of habitat assessments.²⁹⁷

A July 2011 report on the implementation of the biop, funded by the NWF and the Washington Department of Commerce, was published by Kramer Consulting.²⁹⁸ The report discussed the efforts of five communities, including the City of Everett, to use the Door 2 checklist to comply with the biop. The report concluded that the biop recommendations were not viable for communities with degraded floodplain functions, such as Everett's floodplains, which have been industrial zones for over a century. The Kramer report recommended tailoring biop regulations to the level of floodplain function in a community.²⁹⁹ At the same meeting, a tribal perspective on the biop was offered by James Weber, who pointed out that whether or not the biop would

²⁹⁵ Ibid.

²⁹⁶ Ibid.

²⁹⁷ Jan Hasselman, "Declaration of Jan Hasselman in support of plaintiff's motion for summary judgement," Case No. 2:11-cv-02044-RSM), (W.D. Washington), October 5, 2012.

²⁹⁸ Kramer Consulting, Inc., "Floodplain Technical Assistance Project: Issues and Strategies Paper," July 2011, <http://www.gordonderr.com/files/Publications/FloodplainTechAssistance%20Recommendations%207.6.11.pdf>.

²⁹⁹ "Legal CE Course: Impacts of FEMA Floodplain Mapping: Regulatory Changes and Implications for Local Jurisdictions and Property Owners," accessed March 11, 2013, <http://www.cledirectory.com/impacts-of-fema-floodplain-mapping-seattle-washington-cle.html>.

protect salmon habitat, it would not restore salmon habitat, and that the continuing loss of salmon population and habitat represented a violation of treaty rights with native communities.³⁰⁰

In December 2011, the NWF filed a second lawsuit against FEMA, and requested an injunction against the NFIP in the Puget Sound, since it did not feel that FEMA had adequately complied with the biop.³⁰¹ Their motion for the injunction, based on the premise that the second lawsuit would be successful and that FEMA would not be able to prove that their implementation program, altered from the original RPA, would pose no jeopardy to the listed species, was denied. The court ruled that the NWF did not demonstrate that jeopardy would result from the changes to the NFIP made by FEMA in Puget Sound, and could not demonstrate irreparable harm done to the listed species in the absence of an injunction, but did not comment on the merits of the case, which continues.³⁰² In this second lawsuit, sixteen cities, including Arlington, Auburn, Burlington, Everett, Federal Way, Kent, Lake Forest Park, Mount Vernon, North Bend, Orting, Port Angeles, Puyallup, Renton, Snoqualmie, Sultan, and Tukwila, joined FEMA as intervenor-defendants in the lawsuit. This litigation is ongoing.

Theory of Good Regulation

Based on the OECD principles in Table 1.2, the RPAs outlined in the biop do not meet the requirements for regulatory quality and performance. As implemented in the program designed by FEMA, they meet even fewer of them. Principle 1 requires clear objectives and frameworks

³⁰⁰ The Seminar Group, "Impacts of FEMA Floodplain Mapping," February 1, 2012, accessed March 11, 2013, <http://www.theseinargroup.net/brochures/12.FLDWA%20Brochure%20ni.pdf>.

³⁰¹ Molly Lawrence, "National Wildlife Federation Files New Suit Against FEMA-Seeking Injunction Halting the Sale of NFIP Flood Insurance in the Puget Sound Region," December 15, 2011, accessed March 11, 2013, <http://www.northwestlandmatters.com/development/national-wildlife-federation-files-new-suit-against-fema---seeking-injunction-halting-the-sale-of-nf/>.

³⁰² Paul Weiland, "Federal Court Declines to Halt Issuance of Flood Insurance in Puget Sound," April 19, 2012, accessed March 11, 2013, <http://www.endangeredspecieslawandpolicy.com/2012/04/articles/court-decisions/federal-court-declines-to-halt-issuance-of-flood-insurance-in-puget-sound/>.

for implementation. The RPAs have a clear objective in protecting threatened salmon, but not a clear framework for implementation by local governments. The implementation program design by FEMA was intended to clarify the framework of implementation, but local governments expressed confusion about the implementation program. Principle 2 describes assessment of regulations. NMFS outlined reporting requirements. FEMA follows some of those requirements, but NMFS has not clarified the reporting and assessment standards, or asked for improved monitoring of biop compliance from FEMA. Principle 3 requires that implementation and regulations be transparent. The lack of public availability of portions of the 2009, and the full 2011, Annual Reports, as well as the concerns about inconsistency and lack of clarity from Pierce County and other implementing communities indicate this principle has not been met. Principles 4-5 address competition policies, and are not applicable to this biop. Principle 6 addresses regulatory barriers to trade. The second lawsuit includes a group of local communities implementing the biop, including the City of Everett, who argue that attempts to strengthen the biop by the NWF would limit economic development in the floodplain. Principle 7 suggests that policy objectives be linked with complementary regulations, where possible. Despite the NMFS attempt to include additional programs with similar goals in the RPA, including levee standards that ACOE has more control over, and funding sources available to FEMA for other hazard mitigation programs, the biop was limited in its ability to link complementary regulations. FEMA has resisted the inclusion of either of those programs in the biop implementation, though it reports which hazard mitigation grants may improve salmon habitat. Attempts to address NFIP criteria through state floodplain management legislation changes, or to include levee standards and NFIP programs in SRP programs, would meet Principle 7, but are beyond the scope of the biop process begun by NWF's 2003 lawsuit.

Principles 1, 2, and 3 are the most important in determining if a regulation will be clear and enforceable. The biop does not appear to have satisfied any of these principles.

Theory of Implementation

This implementation process can be described as both top-down and bottom-up at multiple levels. The initial implementation design set by the NMFS was a top-down set of rules, created by a federal agency, with terms imposed on FEMA and the NFIP participating communities. However, it was instigated by a lawsuit filed by a non-governmental third party, making the impetus for the process ‘bottom-up’. The implementation programs designed by FEMA were designed to meet the criteria of the top-down biop, but FEMA not only changed the implementation program presented in the biop, it also created an implementation program that relied on local discretion in creating acceptable regulations. Each community ultimately also had to decide what their own implementation process was going to look like. Given the changes made between the drafting of the RPAs, the implementation program designed by FEMA, and the local implementation processes indicated that the ‘top-down’ directions from NMFS were not specific enough to firmly constrain the options available to local governments in implementing the biop. The three options for compliance, including only one where a specific MO was adopted, given by FEMA, indicate a shift from a top-down to a bottom-up implementation process after the biop was issued.

As described by other participants in the implementation process, several groups showed behavior that can be characterized by games described by Bardach. NWF described FEMA actions that are consistent with the Tokenism game: FEMA completed portions of their promised compliance programs, but have not finished reviewing compliance applications over a year after

the deadline.³⁰³ The “Not my Job” game characterizes how both NMFS and the NWF felt that FEMA was acting with regard to levee vegetation standards.^{304,305} As it was described in the Graves interview, FEMA also appeared to play a Keeping the Peace Game in the creation of their three door implementation options, while balancing the environmental concerns of the biop and the input from local governments.³⁰⁶ The various governments responsible for the final implementation of these rules could also leave this process susceptible to a Social Entropy game. It is comforting that none of these games are from the diversion of resources typology. However, no resources beyond technical assistance were distributed to aid communities in complying with the biop requirements. The games noted in these interviews are summarized in Table 3.3.

Table 3.3: Bardach’s Games Observed from Informational Interviews

Participant	Category	Game
FEMA	Dilemmas of Administration Dissipation of Energy Deflecting Goals	Tokenism Not my Job Keeping the Peace
Local Governments	Dilemmas of Administration	Social Entropy

Potential Drawbacks of Implementation Frameworks

First generation studies of implementation, such Bardach, placed the responsibility for success or failure of a policy in the hands of the legislative direction and bureaucratic compliance with the process.³⁰⁷ Selection of these models will downplay the role of public pressure in implementation in favor of local government pressure, though local governments may be influenced by fear of public pressure. This process has been informed more by the potential for public pressure or opposition than the actual presence of such opposition. The NWF, NMFS, and

³⁰³ NWF Interview.

³⁰⁴ Ibid.

³⁰⁵ Shorin Interview.

³⁰⁶ Graves Interview.

³⁰⁷ Schofield, “Public Policy Implementation,” 249.

FEMA all expressed concern over potential takings claims over changes to floodplain management regulations.^{308,309,310} In this process, the only actual public comment period was during FEMA's preparation and publication of their 3 door approach. Since Everett used an administrative process to implement the changes, no public comment period was required. No public comment period has been required for Pierce County's compliance process either, though if changes are made to CMZ ordinances, one may be.

Case Studies

Both communities profiled in the case study have applied through Door 2, the checklist option. This compliance option provided the most amount of leeway for how communities met the requirements of the biop. As floodplain managers in one community pointed out though, the final requirements for compliance through Door 2 are basically the same as the requirements for compliance through Door 3, which are also the same final requirements for Door 1: all permits issued in the designated area are reviewed.³¹¹ Everett is waiting for a response from FEMA on their application packet, and Pierce County is waiting to discuss FEMA's latest reply to their application for a CAV in late 2012.

While the case studies focus on communities working to get through the same door, the City of Everett and Pierce County have very different sets of planning constraints. The City of Everett is an urban area with a small section of floodplain in the delta of one river, whose biop compliance has been coordinated by Planning and Community Development staff. The staff member who

³⁰⁸ NWF Interview.

³⁰⁹ Shorin Interview.

³¹⁰ Graves Interview.

³¹¹ Dixon, Dennis and Hans Hunger. Interview by author. In person. Tacoma, WA, October 5, 2012.

has been most involved in dealing with biop compliance has other primary duties. Support from state agencies and county and city scientific staff was available to him. In Pierce County floodplain managers dealing with the biop compliance are responsible for multiple river floodplains in unincorporated, and less urbanized, areas. These two County staff members have other responsibilities, but floodplain issues are a large part of their duties. They are both engineers and certified floodplain managers (CFM).

City of Everett

Everett is within the Municipal Urban Growth Boundary designated by Snohomish County under the GMA, and has a population of over 103,000.^{312,313} Median household income in 2011 was over \$46,000.³¹⁴ Everett's main employment sectors are manufacturing, finance/insurance/real estate/services, government, and retail, and it is a 'job center' for the population of Snohomish County.^{315,316}

The City of Everett is located mostly on a peninsula of high ground surrounded by steep bluffs to the west, north, and east of the city. The Snohomish River, which is tidally influenced back to an area on the east of Everett, approaches Everett from the southeast and flows around the north of the peninsula through a floodplain area, as shown in Figure 4.1. The river feeds Jetty Island with sediment. This estuarine wetland has been diked, drained, channelized, and dredged for

³¹² City of Everett, "2025 Comprehensive Plan," accessed March 11, 2013, http://www.everettwa.org/Get_PDF.aspx?PDFID=932, 8.

³¹³ Bureau of the Census, 2010 Demographic Profile Data, Profile of General Population and Housing Characteristics: 2010, Everett City, Washington, DP-1, <http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk>, accessed March 11, 2013.

³¹⁴ American Community Survey, Median Income In The Past 12 Months (In 2011 Inflation-Adjusted Dollars), Everett City, Washington, S1903.

³¹⁵ City of Everett, "2025 Comprehensive Plan," 13.

³¹⁶ *Ibid.*, 12.

agriculture and navigation since the late 1800s.^{317,318} Much of the city's industry has been placed on its shorelines for the past 100 years, including sawmills, paper manufacturing, and a regional port facility. Much of the habitat value of Everett's floodplains was destroyed by these facilities decades ago, but federal and state laws, and local clean-up efforts financed by the Port and other private developers, have led to the cleanup of the river and Port Gardner.³¹⁹

³¹⁷ City of Everett, "Snohomish Estuary and Wetland Integration Plan," April 1997, accessed March 11, 2013, http://www.everettwa.org/cityhall/upload_directory/SEWIP%201997.pdf, 1-6.

³¹⁸ Ervine Interview.

³¹⁹ Ervine Interview.

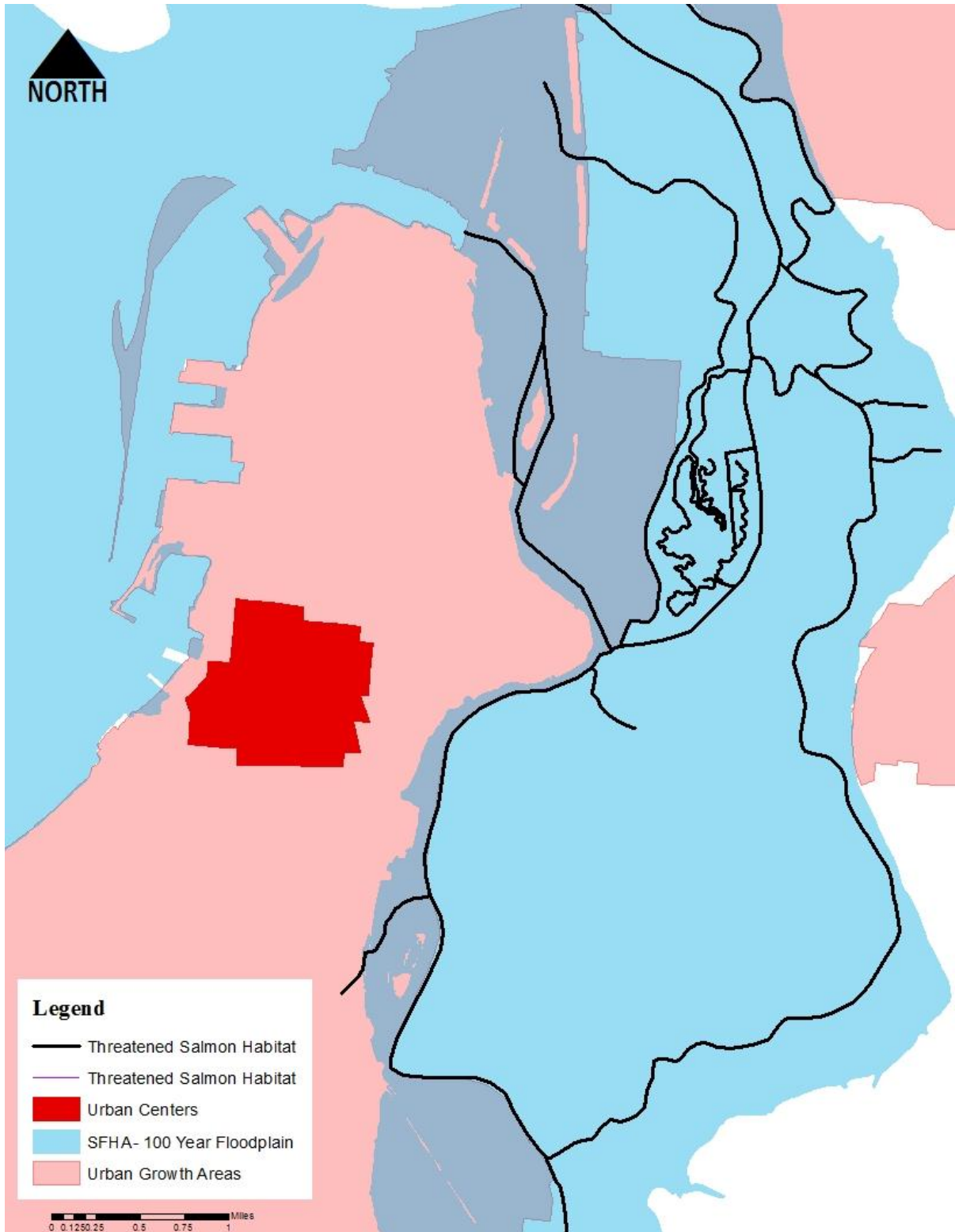


Figure 3.1: Floodplains in the City of Everett

Source: Map by author

The development of a regulatory framework for the environmental protection of estuary and wetland areas around Everett was begun before Chinook salmon and Bull trout were even listed as threatened species in 1999. In 1993, the City of Everett combined Environmental Protection Agency, Washington State DOE, the Port of Everett, and city funds to create the Snohomish Estuary Wetland Integration Program (SEWIP), which inventoried wetland areas in Snohomish and integrated federal, state, and local development permitting processes in wetlands.³²⁰ A main purpose of this document, completed in 1997, was to identify where development might still occur in the studied areas, and where restoration or mitigation projects associated with development would have the greatest impact.³²¹ The minimum management goal set for the Snohomish River estuary was ‘no net loss’, with an additional goal of enhancement and restoration of the estuary where possible.³²²

The SEWIP identified seven salmon species that used the Snohomish estuary near Everett for migration, development of juveniles, and as a refuge and feeding area.³²³ When Puget Sound Chinook were listed as threatened in 1999, the SEWIP was updated with a salmon overlay, in an effort to comply with the city’s ESA Section 4(d) responsibilities. The Salmon Overlay, published in 2001, inventoried anadromous fish habitat in order to determine location and quality, and to set priorities for enhancement or restoration projects.³²⁴ The management goals of this document included protection of existing undeveloped salmon habitat, and a net gain in habitat area, function, and value.³²⁵

³²⁰ City of Everett, “Snohomish Estuary Wetland Integration Plan,” 1.

³²¹ *Ibid.*, 2.

³²² *Ibid.*, 5-1.

³²³ *Ibid.*, 3-9.

³²⁴ City of Everett, “Salmon Overlay to the Snohomish Estuary Wetland Integration Plan,” March 12, 2001, accessed March 11, 2013, http://www.everettwa.org/cityhall/upload_directory/SEWIP%20Salmon%20Overlay.pdf, 2.

³²⁵ City of Everett, “Salmon Overlay,” 123.

In 2000, the Everett Planning and Community Development office issued Planning Director Interpretation (PDI) 2-2000 on the listing of Chinook salmon and Bull Trout as threatened species. PDI 2-2000 created new administrative rules for the review of activities that would affect either species. EMC 19.37, the City of Everett's environmentally sensitive areas regulation, already required evaluation of the effects of development proposals on or adjacent to the habitat of threatened or endangered species.³²⁶ The PDI made it clear that any development proposal on located within 200 feet of the water bodies, including rivers, streams, and the Snohomish River estuary, as well as shorelines and wetlands, should conduct a biological assessment to determine the impacts of the development on the listed fish and their habitat, evaluate mitigation measures, and propose a Habitat Management Plan if impacts would be unmitigated.³²⁷ The city used the more stringent 200 foot buffer of the Shoreline Management Act.³²⁸ In addition, the City reserved the right to require habitat enhancement in developments on disturbed riparian areas.³²⁹

The City of Everett became involved in the implementation process of the biop as participants in the initial focus group that FEMA put together on the draft model ordinance. Gerry Ervine, a Land Use Manager and member of the Everett Planning and Community Development department, attended those meetings. His initial impression of the proposed ordinance was that it would halt development and redevelopment of Everett's waterfront entirely, which is the city's primary planning concern.³³⁰ Some of these areas are brownfield sites, and redevelopment money may fund their clean-up. Along with several other members of the focus group created

³²⁶ Paul A. Roberts, "Planning Director Interpretation: Interim Procedures, Endangered Species Act (ESA) Listing for Chinook Salmon and Bull Trout," PDI 2-2000, November 28, 2000, accessed March 11, 2013, http://www.everettwa.org/cityhall/upload_directory/Shoreline%20Master%20Program/AppendixA5.pdf, 1.

³²⁷ *Ibid.*, 3-4.

³²⁸ *Ibid.*, 2.

³²⁹ *Ibid.*, 5.

³³⁰ Ervine Interview

early in the implementation process by FEMA, he pushed to get another option for compliance on the table, which resulted in the creation of Door 2.^{331,332}

The City of Everett considered several options for implementation of the biop requirements. The Model Ordinance, as modified by the focus group, was considered, but rejected as being too limiting for the economic development and redevelopment of the city shorelines, which is the city's main priority.³³³ The development of ordinances to submit to Everett's City Council was also considered, but with the resources of the SEWIP and the Salmon Overlay, Everett decided to use an administrative procedure to implement the biop. A new PDI was developed to create and administrative regulation that would satisfy the requirements of the biop.

The new PDI 2011-1 was published July 20, 2011, and specifies that if it conflicts with the PDI 2-2000 requirements, the more stringent standard prevails.³³⁴ It requires development permits, including permits to remove vegetation or alter the site, within the SFHA and the protected area to show the 100 year flood elevation, the floodway boundary, and the protected area boundary on the site plan. The applicant must also provide a biological assessment of the area, analyze the impacts of the development of listed species and their habitat, prepared as directed by the guidance FEMA issued for floodplain habitat assessment. Development in the protected area and conservation measures would not be allowed to adversely affect water quality, quantity, flood volume or velocity, spawning substrate, or refugia.³³⁵ Compensation for flood storage and fish habitat function must be provided for impacts outside the protected area, and indirect effects must be mitigated. The standard of 'no net adverse effect' is used within the 100 year floodplain

³³¹ Ibid.

³³² Graves Interview.

³³³ Ervine Interview.

³³⁴ Allan Giffen, "City of Everett Planning Director Interpretation No. 2011-1," July 21, 2011, 4.

³³⁵ Ibid., 4.

and avoidance and conservation measures are stipulated for the protected area.³³⁶ LID methods are required for all projects in the 100 year floodplain, and development proposals are encouraged to protect habitat both on and offsite. This implementation plan was submitted under Door 2 to FEMA on July 22, 2011.³³⁷ To this date, it has not been approved or denied by FEMA. Ervine estimated that even though the City had avoided going through the legislature to approve new ordinances to implement the biop, about 600-800 hours of work from the Legal and Planning departments had been required to prepare materials for the implementation of these regulations in Everett. Without the previous preparation of the SEWIP and the Salmon Overlay that are the basis for their compliance solution, it would probably have taken Everett much more time to devise a solution.

While he pointed out that FEMA and NMFS had been available for meetings and had taken suggestions during the process, especially during the focus group set up by FEMA, the main impression Ervine expressed was one of frustration at the time the process took, the initial lack of options offered by FEMA for compliance, the delay in finding out whether Everett's implementation plan was acceptable, and the relatively small increase in protections for fish and floodplain land in Everett gained by the process.³³⁸ FEMA has not commented on their proposal since it was submitted in 2011.³³⁹ Ervine suggested that the process could have been improved if funds had been made available to offset the costs of staff time and hiring consultants to deal with compliance.

³³⁶ Ibid., 5.

³³⁷ Ervine Interview.

³³⁸ Ibid.

³³⁹ Ibid.

It is not clear if FEMA and NMFS will consider the no net adverse effect standard adequate to meet the no adverse effect standards set forth in the biop, though Ervine was confident that the standards of the PDI met the requirements of the biop. Though the NFIP includes areas influenced by tidal flow, Everett makes the argument that since much of their mapped floodplain is more influenced by tidal flows than flood flows, the compensatory storage requirements of the biop do not apply in those places.³⁴⁰ Everett also contends that since the Snohomish River has been heavily modified, the city cannot designate a channel migration zone, which effects their designation of a protected area.³⁴¹

The City of Everett has joined with several other cities to challenge the NWF as defendant-intervenors in NWF's second lawsuit for a preliminary injunction against the NFIP.³⁴² Their brief filed in the case points out that the GMA and SMP plans each city manages have a 'no net loss' standard for fish habitat, and those have not been challenged by the NWF for failing to adequately protect fish.³⁴³ The cities argue that the NWF should not be granted a preliminary injunction because their lawsuit is not likely to succeed on the merits, since it will not be able to prove that development permits issued since the biop have led to 'harm' or 'take' under ESA regulations. The brief also contends that an injunction against the issuance of new floodplain development permits is not narrowly tailored, and would harm local communities by prohibiting development necessary in the 'current economy', as well as development permits for projects that would benefit fish.³⁴⁴

³⁴⁰ Ibid.

³⁴¹ Allan Giffen, "Planning Director Initiative 2011-1," 3.

³⁴² Debra Smith, "Everett joining other cities to fight lawsuit seeking limits on shoreline development," The Herald, January 26, 2012, accessed March 11, 2013, <http://www.heraldnet.com/article/20120126/NEWS01/701269929>.

³⁴³ NWF v FEMA et al., "Cities' Response in Opposition to Plaintiff's Motion for a preliminary Injunction," Case 2:11-cv-02044-RSM (W.D. Washington), 8.

³⁴⁴ Ibid., 38.

Implementation Theories

The City of Everett's participation as defendants in the second lawsuit might be construed as a tenacity game, though Everett is not attempting to subvert compliance with the biop. In fact the lack of response to their compliance package may indicate a game of tokenism on the part of FEMA. In order to fulfill their goal of keeping land available for economic development, the City of Everett appears prepared to play a tenacity game with NWF by participating in the second lawsuit.

Pierce County

The unincorporated section of Pierce County, which is the subject of this case study, has a population of 366,738.³⁴⁵ Major rivers, including the Nisqually, Puyallup, Carbon, and White, flow from Mt. Rainier in the southwest to Puget Sound in the northeast. Figure 3.2 shows the locations of the 1987 maps of 100-year floodplains in relation to endangered salmon habitat and urbanized areas of Pierce County.

³⁴⁵ Dixon and Hunger Interview.

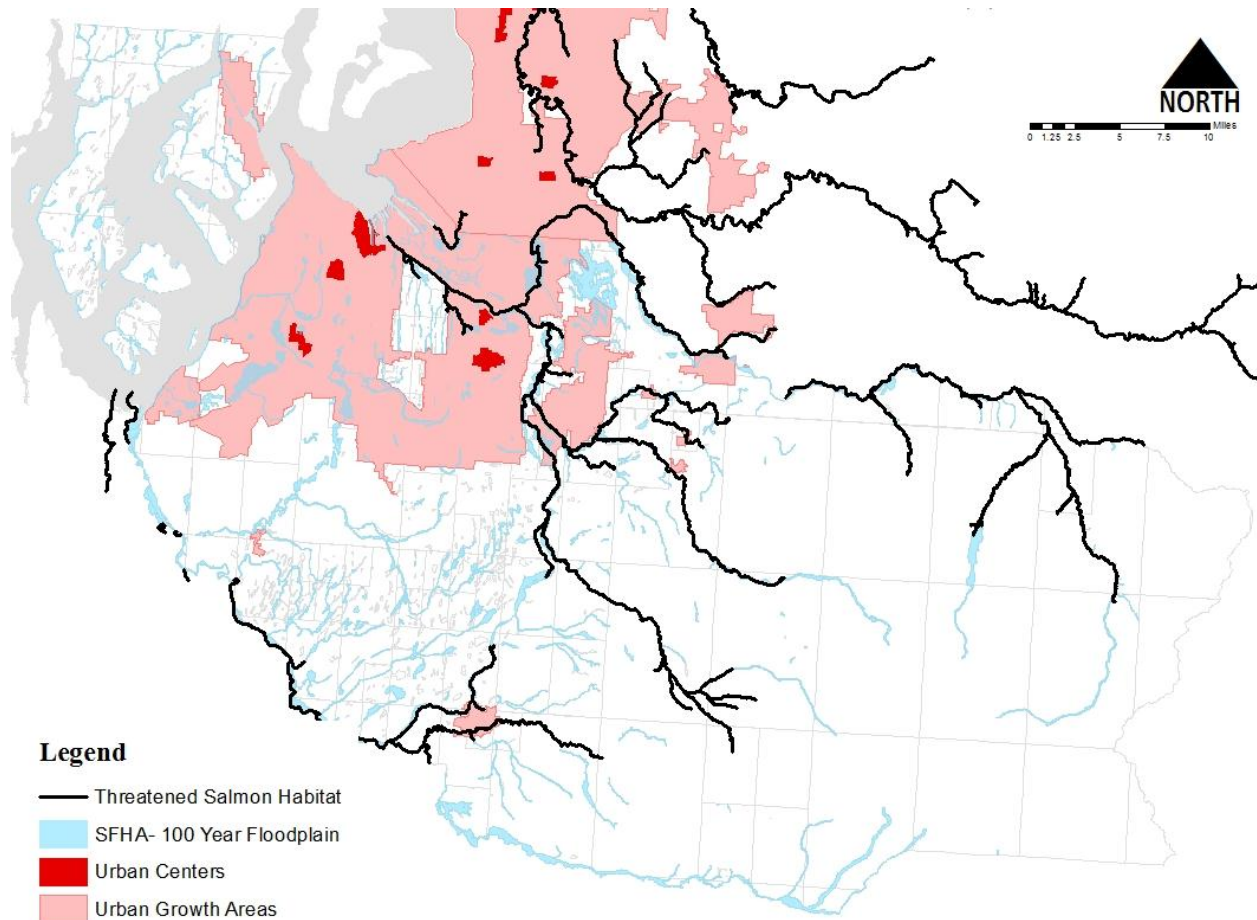


Figure 3.2: Floodplains in Pierce County

Source: Map by author

The biological opinion cites Pierce County as having exemplary floodplain management regulations.³⁴⁶ Current Pierce County regulations are set in the critical area code, which is Title 18E of the county code.³⁴⁷ Pierce has been undergoing a mapping update with FEMA since 1999, and in 2005, new draft maps were issued for the county. The existing maps are from 1987, and have been digitized. The adoption of the new maps has been delayed for seven years, most recently due to issues in mapping unaccredited levees. Pierce County has been attempting to

³⁴⁶ NMFS, Biological Opinion, 15, 172.

³⁴⁷ Pierce County, “Development Regulations – Critical Areas,” Title 18E, accessed March 11, 2013, <http://www.co.pierce.wa.us/DocumentCenter/View/1160>.

regulate to the 2005 draft maps by consulting both sets of maps for floodplain regulation, and using LOMC to correct the 1987 maps when possible.³⁴⁸

The two men primarily responsible for floodplain management regulation and biop compliance in Pierce County are Hans Hunger and Dennis Dixon from Pierce County Surface Water Management department. Hunger is a registered Professional Engineer (PE), and Dixon is a Civil Engineer. Both men are CFM. Pierce County's Door 2 compliance package has not been approved, and the floodplain management staff had been planning to continue discussing the submission during their 2012 CAV. Their compliance plan consists of a change to administrative procedures that increases reporting standards for floodplain development permits. Additional changes may be made to county ordinances on development in the CMZ, but Hunger and Dixon want to make sure that FEMA will approve the ordinance wording as compliant before they begin the political process of changing county regulations.

Adoption of the model ordinance was not considered seriously, since it was based in large part on existing floodplain management codes in Pierce and King Counties, and because, as Dixon pointed out, the Model Ordinance is not written as a local regulation, and does not take into account Pierce County's review processes.

Hunger and Dixon agreed that their working relationships with FEMA and NMFS were strong throughout the process of creating and implementing the biop, though they were occasionally frustrated with aspects of the process. Both expressed concern at the lack of clarity, consistency, and transparency from both agencies on the issues of interpretation raised by the biop itself, and the implementation and review processes. Hunger described an issue with getting NMFS to

³⁴⁸ Dixon and Hunger Interview.

decide that the FEMA Model ordinance would meet the biop requirements, due to a delay in forming a cohesive agency response. Neither feel that the biop had a significant impact on how Pierce County dealt with endangered species habitat, though both agreed that the biop set a minimum bar that made it easier to convince county officials to not backtrack on the county's progressive floodplain management policies.

Hunger expressed concern that it was not clear that agency reviewers of compliance packages were not operating by the same standards, and that one community may be judged compliant with regulations that another reviewer would not consider compliant. He suggested that compliance processes in each community, including the language used in regulations approved as compliant, be collected and made publicly available, to make it easier to determine what standards each community was meeting, and whether unapproved communities had adequate regulations in their submissions.

Dixon suggested that the RPAs may have been improved in clarity if groups issuing permits -- cities or counties -- had been involved in their drafting, to determine if the included standards and language could be enforced. Since FEMA does not actually issue permits in the floodplain, their guidance on RPAs was not sufficient to ensure that local communities could implement the included standards successfully.

Both men also pointed out that the only data actually collected by FEMA for biop compliance, the permits for floodplain development, did not give a clear picture of fish habitat loss, though for different reasons that the NWF identified in their second lawsuit. Permits are issued at many points in the development process, and looking at a year's worth of permits will not give an adequate picture of actual development, since some permits are preliminary, and some are

retroactive. The lack of consequences for non-compliance was also identified as an issue in the process.

Implementation Theories

The implementation process chosen by Pierce County does not exhibit aspects of Bardach's deflecting goals games, though the County is delaying their response to the biop until the CAV from FEMA and the DOE, in order to maximize use of their time and effort in complying with this biop. Until they get approval from FEMA on their proposed CMZ regulation changes, they are attempting to not play Dissipation of Energy games. The biop does aid them in a Keeping the Peace game, however, as it sets a minimum bar for their floodplain management criteria that are under scrutiny by officials wishing to allow more development in the county.

Chapter Four Discussion

Implementation of the 2008 biological opinion is an on-going process. Since it is not complete, it is premature to conclude that it has not been implemented according to its intentions, especially for the City of Everett and Pierce County, whose implementation strategies remain in limbo.

This thesis set out to answer several basic questions: What were the intentions and goals of the groups formulating the 2008 biological opinion? Has the biop implementation met these goals?

Why has the implementation of the biop met, or not met, the goals of the process participants?

Though the process is incomplete, the collected research allows preliminary answers to be given for each of these questions.

Through the lawsuit, the NWF intended to change floodplain management rules on the national level with a goal of protecting threatened species -- in this case, salmon. Neither of these goals has been fully met, though the national dialogue on floodplain management has been shifted and the NWF believes that the biop could protect some fish habitat. By filing an injunction and a second lawsuit against FEMA, the NWF made it clear that they do not believe that the implementation of the biop has met their intentions.

The intention of NMFS was to enforce the ESA, and to protect threatened salmon through a biological opinion process. Shorin believes this process has not gone more poorly than other biological opinion implementations, but agrees that the implementation of the biop is incomplete, not completely monitored, and that the requirements of the biop are not being enforced everywhere.

FEMA intended to maintain the integrity of the NFIP, and to create an implementation program that would be useful to local communities. Graves believes that FEMA has accomplished both of

those goals in this implementation process. FEMA has made it clear that they will not carry out some portions of the RPA, since the agency considers these activities to be outside their jurisdiction.

The City of Everett's goal was to preserve their ability to develop economically in the floodplain. It is not clear if this process will allow for that, but the City has joined defendants in the second lawsuit to continue to pursue it. Pierce County intended to create a consistent flood risk reduction regulation to implement the biop that would be acceptable to citizens and local politicians. Since their compliance package has not been approved, it is not clear if they will meet their goal.

With respect to the reasons why the biop implementation process had met each participant's goals, the conclusions are less straightforward. Despite the previous description of thwarted intent, every interview subject thought that the biop and implementation process had great potential, and not just for curbing the habitat loss for listed species. The NWF was pleased with the protections outlined in the biop itself. NMFS was able to outline protection for species that was missing in the SRPs. While Pierce County already had strong protections for threatened species in floodplains, Hunger appreciated that the biop gave them political cover to continue those protections, by raising the bar across the region. FEMA recognized that the prescriptions of the RPAs of the biop would also help make floodplains safer, since goals of habitat preservation and floodplain storage preservation align.

Interviewees identified several confounding factors when asked if this biop implementation was a success. The NWF pointed out that the housing bust in 2008 limited development more than NFIP restrictions. NMFS discussed state LID restrictions that were already changing the way communities regulate development affecting sensitive habitat. The City of Everett and Pierce

County pointed out that they already had extensive plans to restore salmon habitat and protect threatened species in place before the biop. The biop itself pointed out that with climate change, temperatures of streams have risen, adversely affecting cold water habitat necessary for salmon lifecycles.³⁴⁹ All these factors make it more difficult why the biop implementation has met, or not met its goals, and will complicate further discussion of ways to improve biop implementation.

Concerns with the biop were directed at both the original document, and the implementation of it. The NWF, NMFS, and Pierce County expressed frustration at delays in FEMA's creation of an implementation program. The City of Everett and Pierce County, as well as the NWF and NMFS, were concerned by a lack of clarity and consistency from FEMA during the implementation process, and Pierce County saw a lack of clarity and consistency from NMFS, as well. Some groups not involved in the creation of the biop pointed out that it did not go far enough to solve the salmon issue, by not requiring restoration. The Kramer report, and some local communities, objected that the biop prescribed solutions that urbanized communities could not implement. FEMA protested the RPA on levees, since it considered levee certification standards to be out of its agency jurisdiction.

Despite these concerns, the biop should not be judged for what it was not capable of accomplishing. A biological opinion is the result of a consultation process between one of the wildlife services and the federal agency responsible for the action that triggered the consultation process. And a biological opinion is not retroactive; it recommends action to stop future harm, but it does not repair harm already done to a species. Similarly, changes to the NFIP do not mandate changes to existing development, only to new or substantially improved structures in

³⁴⁹ NMF., Biological Opinion, 60.

the floodplain. When the NWF sued FEMA to cause a consultation, it narrowed the possible range of actions to meet their goals of changing floodplain management practices and reducing harm to threatened species to a consultation process conducted between FEMA and NMFS. Other groups whose policies impact the NFIP, including the ACOE are, by the nature of the option chosen by NWF, not an active part of this process. Other possible and more complete remedies for the loss of salmon, like the partnering of the SRPs and the NFIP outside of the consultation process, were never a simple remedy. The success of the lawsuit could make them even less likely, since the efforts of compliance with the biop may make it more difficult financially and politically to do additional work aligning their SRP and NFIP programs.

The NWF may continue to limit possible outcomes of the biop with additional court actions, since the threat of continuing lawsuits has made local communities nervous about implementation of the biop. One community contacted for an interview for this research declined, citing concern for the ongoing litigation. Litigation also dissipates the time and energy of federal and local staff dealing with these issues. However, the NWF choice of litigation is understandable given their goals of catalyzing change nationwide, and in conjunction with other lawsuits they have filed in other states. When the lack of enforcement of biological opinions is taken into account, additional lawsuits with requests for program injunctions seem to create a method for compelling compliance not otherwise available to those outside- or inside- the process of consultation. Additionally, the finding in the 2008 biological opinion of jeopardy to threatened species in the current implementation of the NFIP makes the need for NFIP change clear, as it has been placed squarely on the wrong side of the ESA, the nation's most powerful environmental protection law.

Recommendations

These recommendations are based on information collected in the interviews and the current state of the implementation of the biological opinion. The underlying assumption of all of these proposals is that the preservation of threatened or endangered species' populations and habitat are an important goal of each of the involved groups.

First, biological opinions should be written to include specific, measureable outcomes that take into account potentially confounding factors and to require consistent reporting. The consultation process should include monitoring and enforcement provisions by the concerned Service, be it the FWS or the NMFS. In this particular case, annual reports were required, but the content of these reports was not specified, and the information provided in them by the attachment of permits is not a useful measure of compliance. Shorin suggested that if the reporting requirements had included compilations of data including the parcels where fill had been placed, the amount of that fill, lost flood storage, the character of landscape prior to development, and the flood frequency at the location of fill, the annual reports would be more useful.³⁵⁰ Given the asynchronous nature of permitting, compilations of reports based on issued permits should also indicate the current stage of development of the project, and whether fill will be used at a later date in the development process, if it is known. The specific type of information requested should be based on the particular threats to the listed species at issue in each biological opinion. In local communities that lack baseline measures of habitat value, or adequate floodplain maps, information on changes during development will be more difficult to obtain. Increased technical assistance and, especially, funding for habitat studies and floodplain studies may be the only solution for that issue.

³⁵⁰ Shorin interview.

Second, involving local governments in drafting regulations which they will eventually be required to implement could make those regulations clearer and more enforceable. The nature of local land use regulation can be mysterious to those with broader regulatory concerns. The translation of federal regulations to local conditions does not just involve realistic adaptation to local conditions. It must also be worded correctly to fit in existing codes, which may already have similar (or contradictory) provisions, and it must be clear to have a chance of being enforced. FEMA, since it requires local governments to oversee NFIP programs, has more experience of assisting local governments to adopt regulations than NMFS. It was clear from interviews with NWF and NMFS that their goals were not as sensitive to the pressures of local governance as FEMA's were. The NWF has national aspirations for regulatory change. By working with a local government to create a readily adoptable set of model floodplain management regulations, the group may gain a greater understanding of the on-the-ground reality of the program they are trying to change, and find it easier to work with local communities in the future.

Third, local communities, the state government, and federal agencies could all create opportunities to link regulatory programs that reinforce each other, such as threatened salmon habitat protection and floodplain preservation and restoration programs. Local communities and NMFS did not include the NFIP in their floodplain management criteria in the SRPs. The DOE has not taken the opportunity to work with the state legislature to raise floodplain management criteria in locations with designated habitat for threatened and endangered species. FEMA had not incorporated threatened and endangered species protection into the CRS program credits. The landscape of floodplain regulations is complicated and overlapping in the Puget Sound

region. Increased cooperation would limit the need for environmental remedy by lawsuit, and allow involved groups more control over the design of a regulation. There is a relationship between flood risk reduction, threatened salmon population and habitat protection, and preservation of other values, and using available methods to address these issues simultaneously will bring broad benefits. In the 2011 Annual Report to NMFS, FEMA reported that it has joined the Puget Sound Federal Caucus, a group of Federal Agencies that coordinate with each other and the Puget Sound Partnership on environmental issues, which is a promising sign.³⁵¹

Fourth, many of the frustrations about lack of clarity and consistency in this process could have been avoided by timely and transparent methods of communication with the public and local jurisdictions by NMFS and FEMA. While FEMA felt that its public involvement and information dissemination process was adequate, other groups involved did not. Standards for approval in the compliance process were not clear, communities waiting approval expressed frustration at not having any way to know if their package were adequate or not, and concern that other communities did not have to meet the same standards to which they were held.

Finally, the lack of clear success in this biological opinion implementation process should serve as a warning of the limits of a biological opinion. It should not detract from the advantages of seeking a consultation on ESA issues. These consultation proceedings open up lines of communication between agencies with different jurisdictions. The findings of a biological opinion on the projected effect of an action on a listed species establish the validity of the action in relation to the ESA. The drafting of RPAs creates a federally-approved minimum bar for

³⁵¹ Federal Emergency Management Agency, "2011 FEMA Region X Annual Report to NMFS," December 21, 2011, 11.

preservation of listed species, which, even if not fully implemented as intended, may serve as support for regulations in other jurisdictions.

The fundamental issue in this process was the preservation of threatened fish populations and habitat. The 2008 biological opinion will not restore the habitat lost over the past decades in Puget Sound. It may help prevent future floodplain habitat loss, but it is not yet complete, and the process has not been monitored to provide data that would measure its impacts on salmon or their habitat. As this process continues- in changes to the NFIP at a national level, and challenges to NFIP programs in other regions of the county- more opportunities to find the cobenefits in flood risk mitigation goals and threatened species protection will be found, at every level of government.

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