

Overview of the Washington State Hatchery System and Production Workshop #1

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Workshop Schedule

- Workshop #1 – Overview of Hatchery System and Production
- Workshop #2 – Risks and Benefits of Hatchery Production
- Workshop #3 – SRKW Management and Population Dynamics
- Workshop #4 – Ecological Interactions



Outline

- Brief History of Hatcheries
- Historical Production
- Orca Task Force Report
- Production Increases – SRKW
- Master Plan





History of Hatcheries

Before Hatcheries...

Prior to 1900, abundance
legendary

Important protein

- Tribes
- The Region
- Internationally

First dramatic collapse
evident just prior to turn of
century

- Over-fishing
- Land and water use practices



Early Role for Hatcheries

Declines in salmon runs prompted call for action

Hatcheries identified as a tool to increase runs



Public Works Initiatives of the 1930's

Multiple State facilities constructed

- Bellingham
- Issaquah
- Minter Creek

USFWS facilities constructed

- Carson
- Entiat



Mitigation Hatcheries

Columbia River

- Mitchell Act – 1938, 1946
- Federal Hydro Projects
- Local/County Hydro Projects

Puget Sound

- Local/County Hydro Projects
- Altered Waterways and Blockages
- Lost Habitat
- Toxic Spills





Hatcheries Today

Hatchery Programs – Dual Role

Conservation

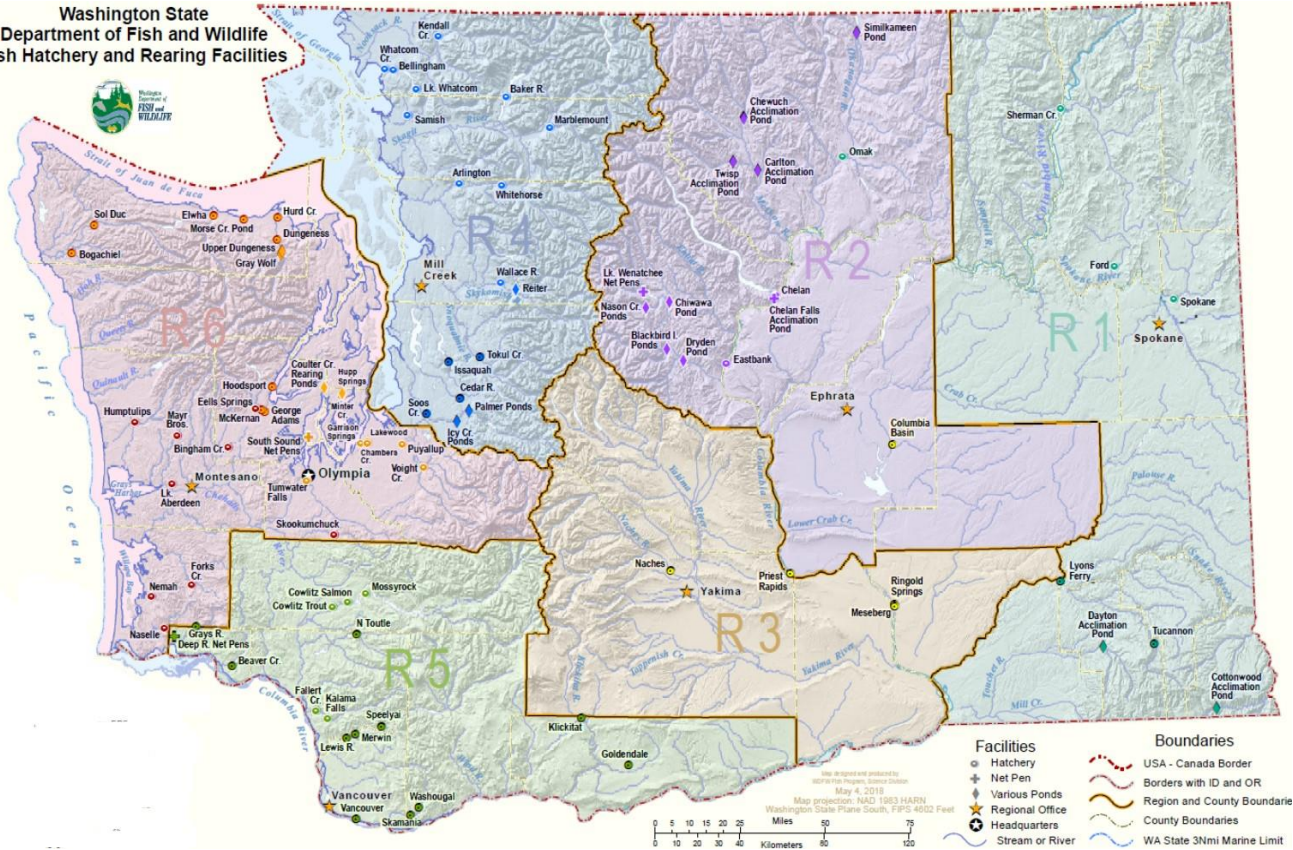


Harvest



WA HATCHERY INFRASTRUCTURE

Washington State
Department of Fish and Wildlife
Fish Hatchery and Rearing Facilities



80 Hatchery Facilities

- 46 – state funded
- 17 – federal funded
- 17 – local funded

Fish Species Raised

- 90% salmon and steelhead
- 10% trout and other game fish



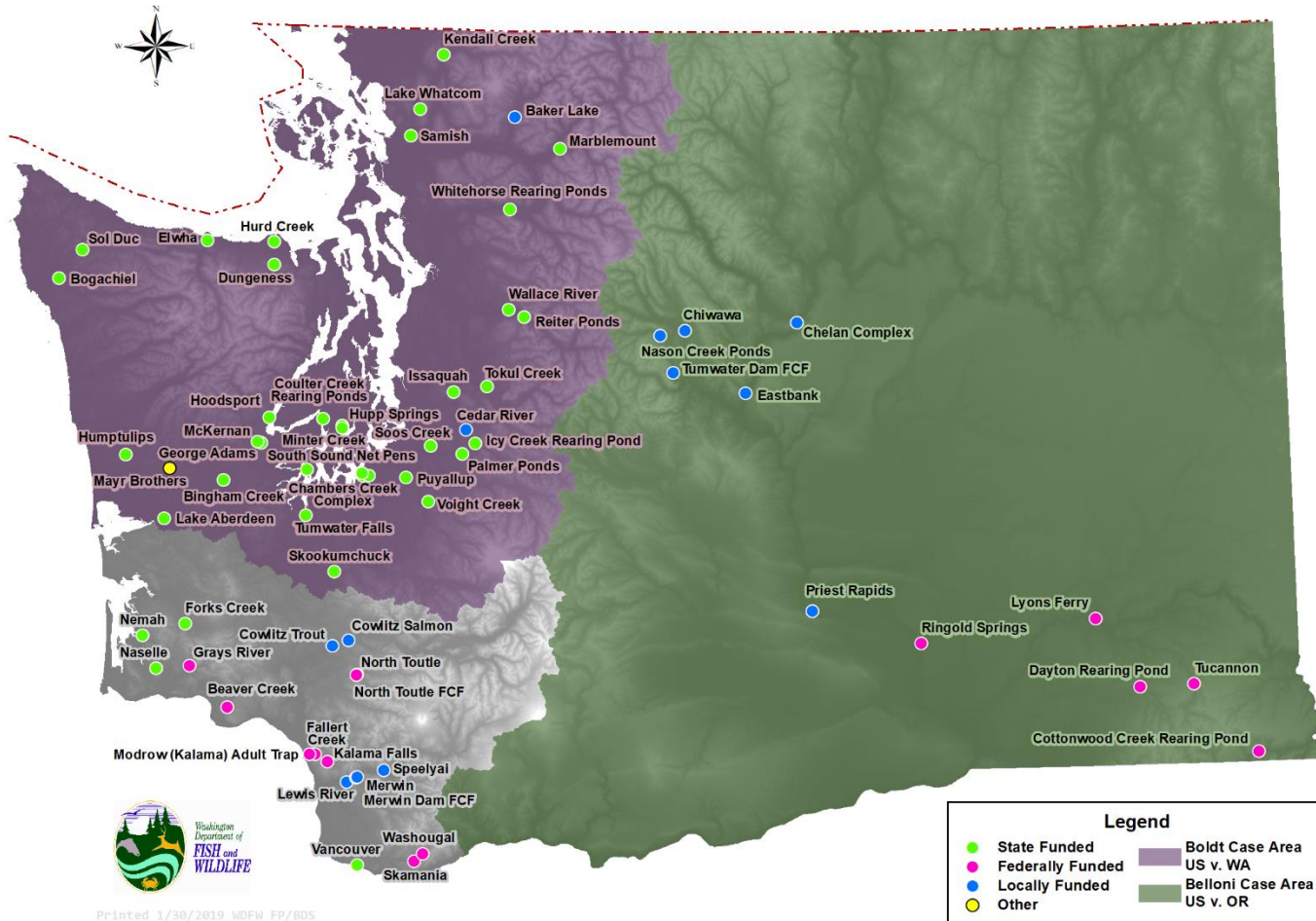
State-Tribal Legal Foundation

Series of court cases in Columbia River and Puget Sound related to fishery management

- Belloni decision – 1969, “fair share.” Became known as *US v. Oregon*. Parties manage under a 10 year management agreement signed in 2018.
- Boldt decision – 1974, “equal shares,” i.e., 50/50 sharing. Remains an active case today known as *US v. Washington*. Many management agreements and consent decrees exist in the case, some directly bearing on hatchery management issues.



Washington Department of Fish and Wildlife State - Tribal Salmon Management Agreement



Cooperative Management

Based on principles of government-to-government relationships.

US v. Washington's 1985 PS Salmon Management Plan

"No modifications may be made to the equilibrium brood document without prior agreement of the affected parties."

US v. Washington's 1986 Hood Canal Management Plan

"In no case will the loss of production in Hood Canal be disproportionate to the overall cutback in the aggregate of the WDFW, USFWS, and tribal facilities."

US v. Oregon; series of agreements for the Columbia River (2018 – 27 US v Oregon Mgmt. Agreement).



Examples of Additional Regulatory Requirements for WDFW Hatcheries

ENTITY	JURISDICTION/REGULATORY ROLE
Pacific Salmon Commission	Reporting and notification requirements on marking, tagging, and hatchery releases.
NOAA	Endangered Species Act (anadromous species), Magnuson-Stevens Act
USFWS	Endangered Species Act (non-anadromous species)
Ecology	Clean Water Act (NPDES), Water Use Permitting



HATCHERY ECONOMICS

Salmon and steelhead fisheries have an average annual economic impact of \$796 million

(Pacific Salmon Commission, annual avg from years 2012-15)

Trout and warmwater fisheries generate approximately \$350 million to the state economy

(WDFW/ DOR data)

Combined recreational and commercial fisheries in WA account for over \$8 billion in sales and support over 65,000 jobs

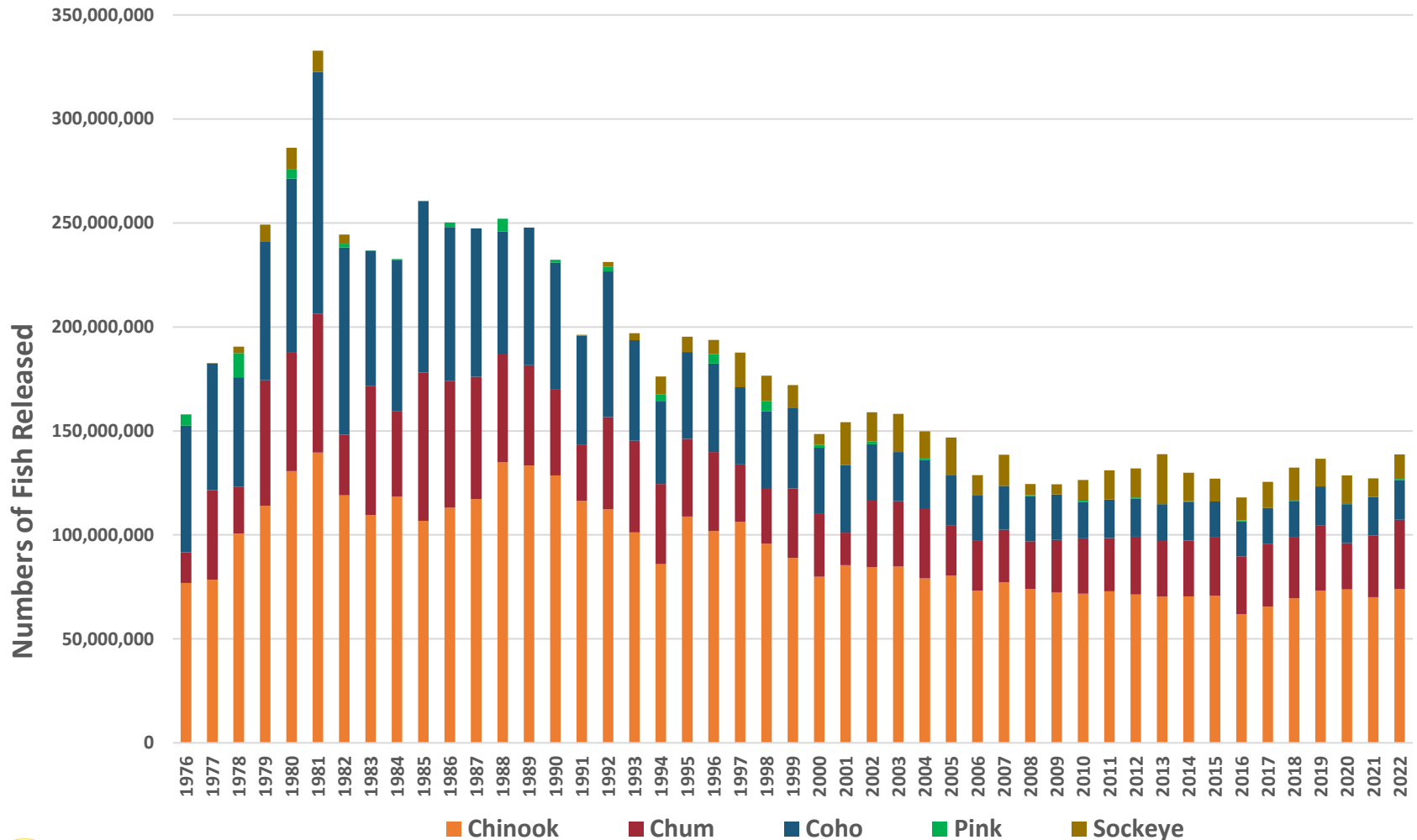
(National Marine Fisheries Service report from 2014)





Historical Production Levels

Production Levels – All Species



HATCHERY RELEASES OVER TIME

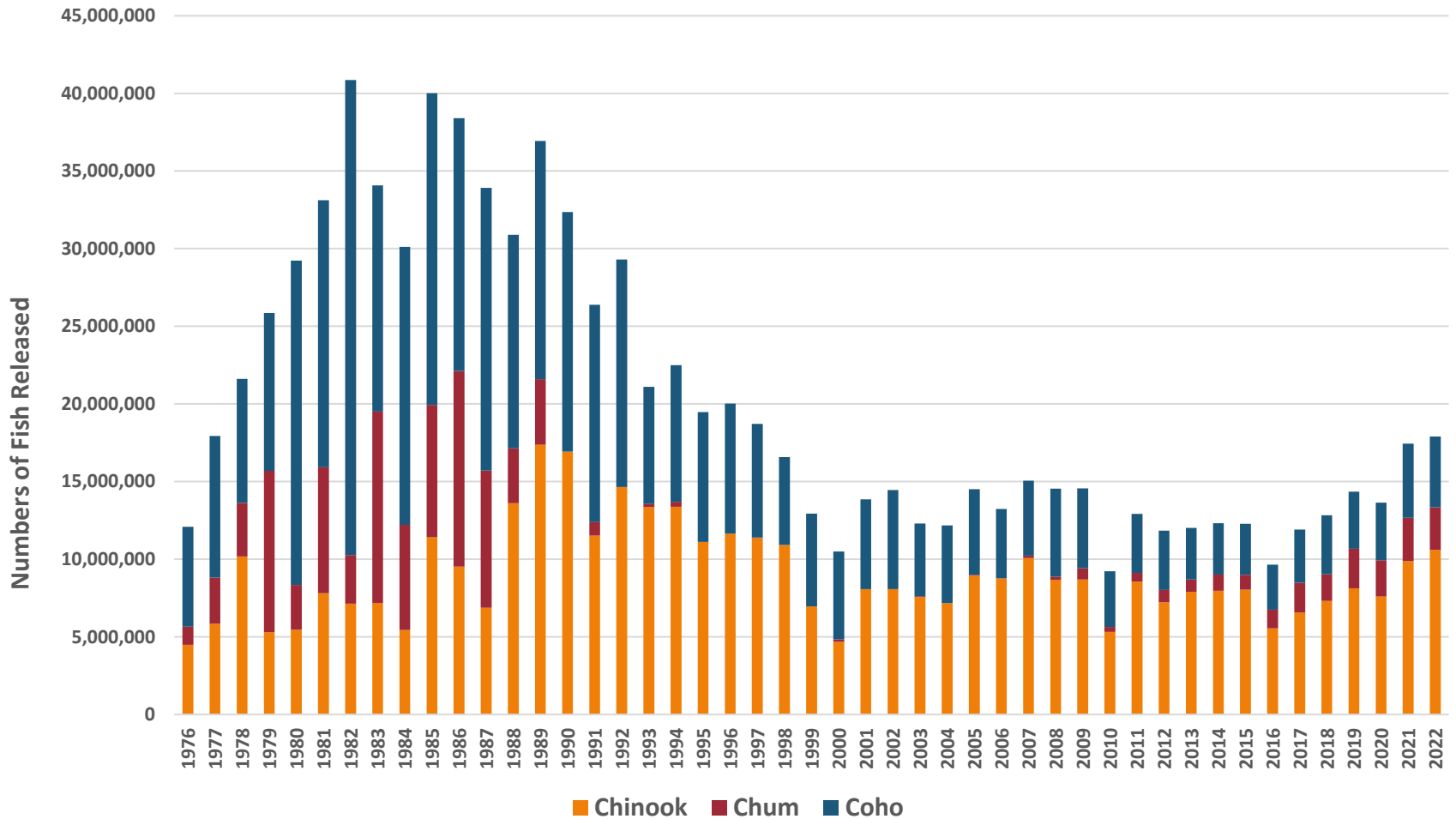
Production has decreased due to various factors:



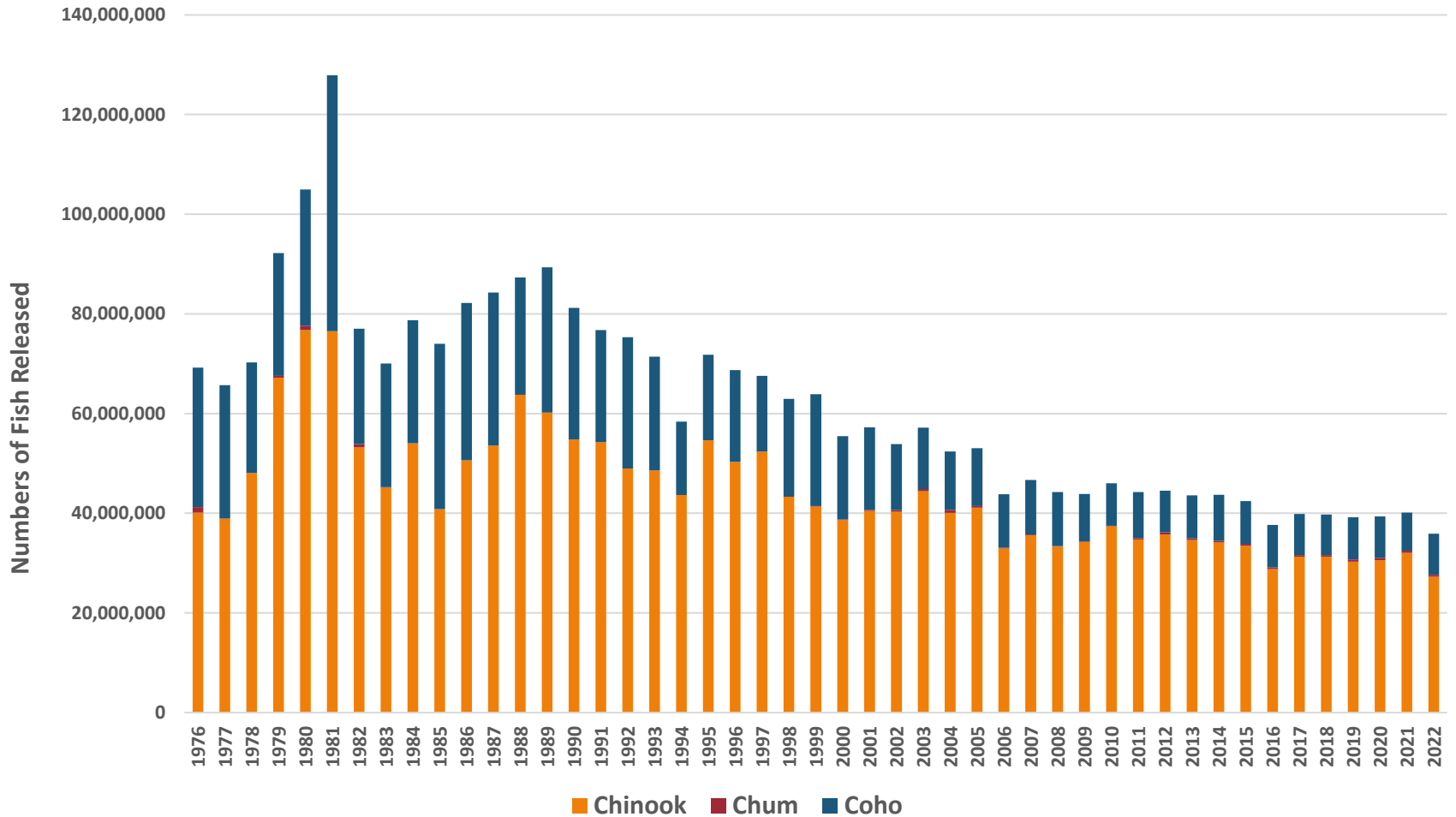
- ESA listings in 1990's
- Hatchery reform
- Mass marking
- General fund cuts of 2009
- Mitchell Act (federal) funding declines and associated facility closures
- Changes in size at release (release studies)



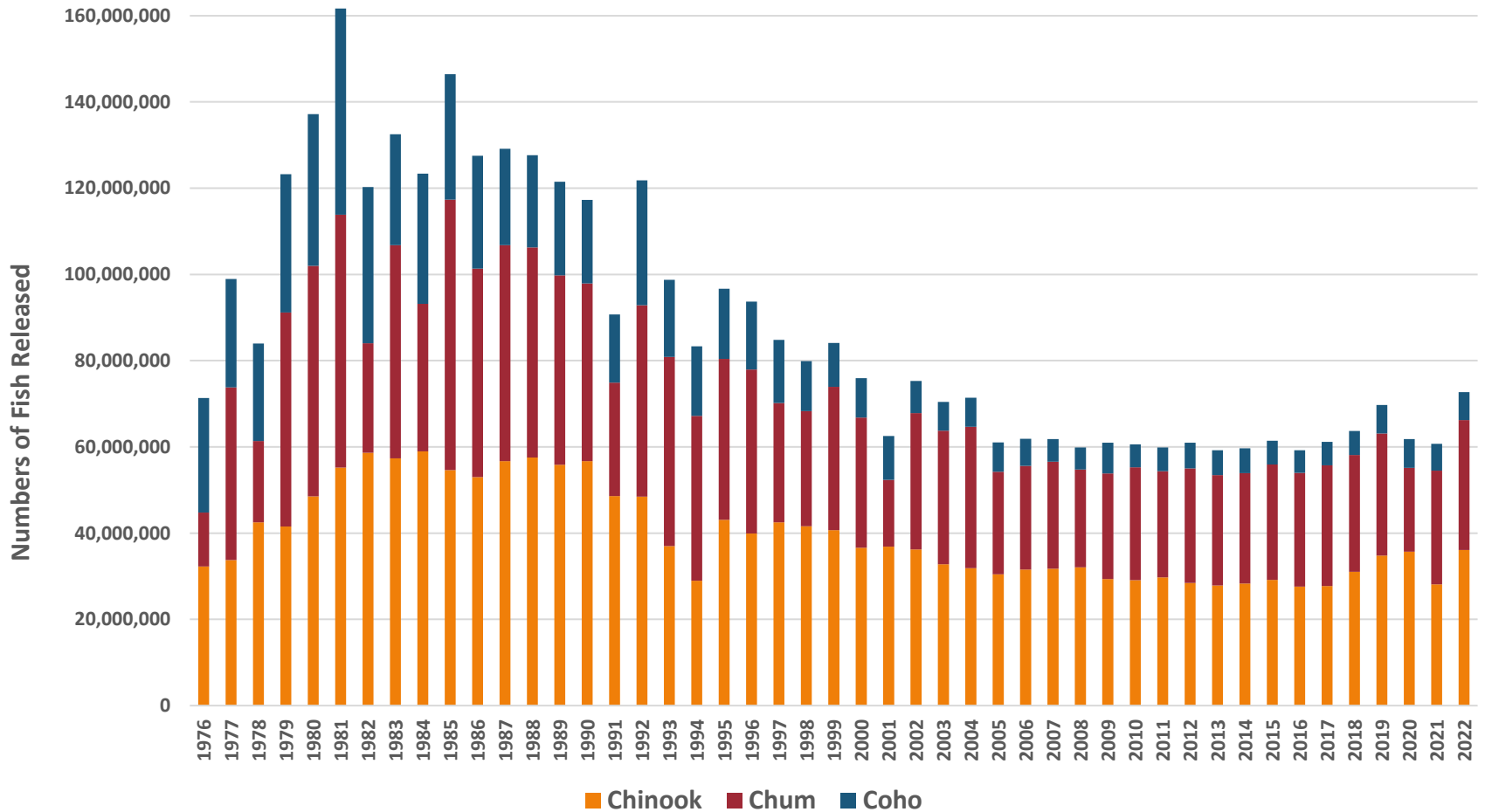
Coastal Production 1976-2022



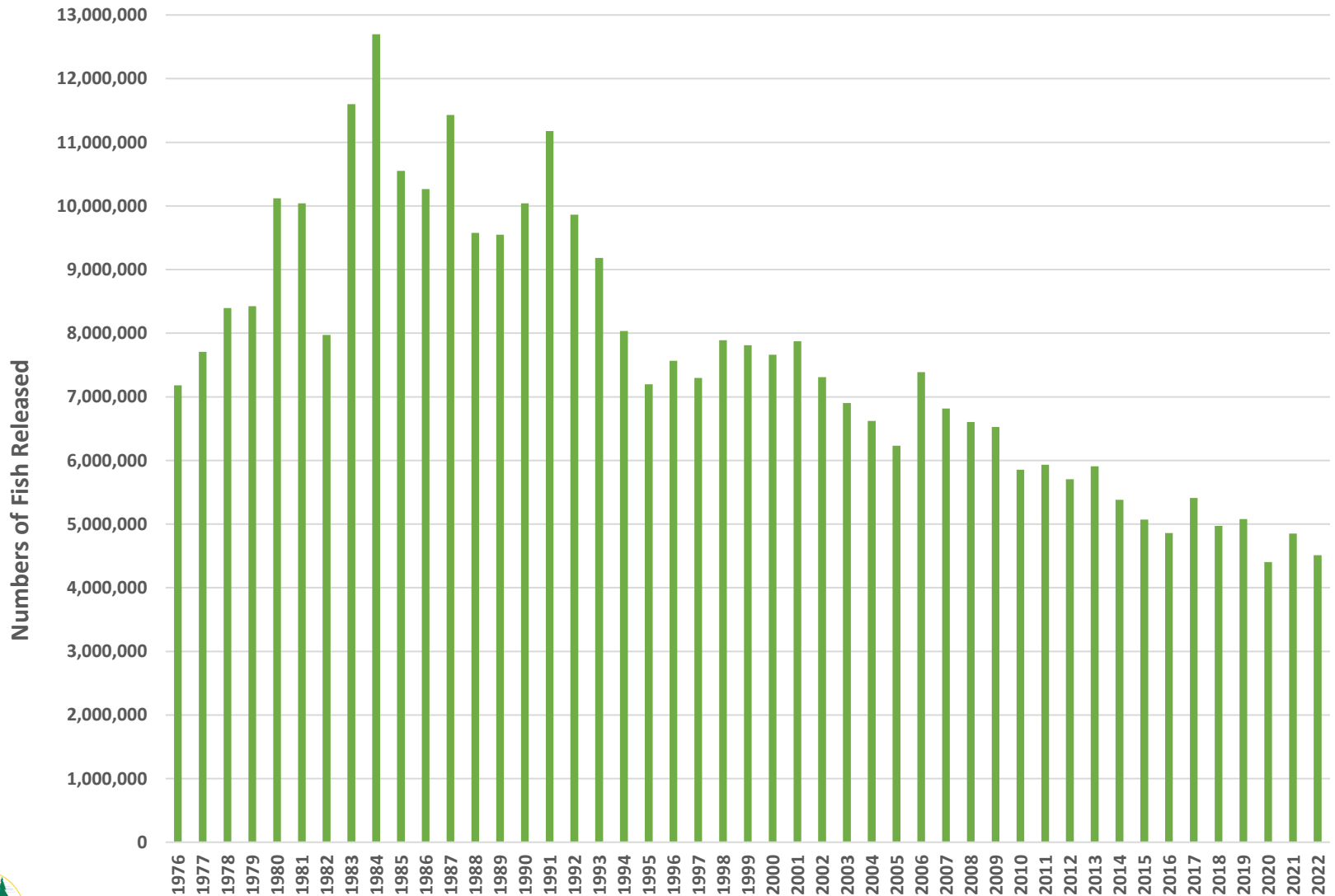
Columbia River 1976-2022



Puget Sound Production 1976-2022



Steelhead Production 1976-2022





Orca Task Force Recommendations

Governor's Orca Task Force

Recommendation #6: Significantly increase hatchery production and programs to benefit SRKWs consistent with sustainable fisheries and stock management, available habitat, recovery plans, and the ESA to be done in concert with increased habitat protection and restoration measures.

Consult with tribal co-managers, NOAA and USFWS when appropriate

In 2018, WDFW Commission adopted policy statement to support an increase of 50 million smolts for additional SRKW prey and fisheries benefits



Governor's Orca Task Force Report

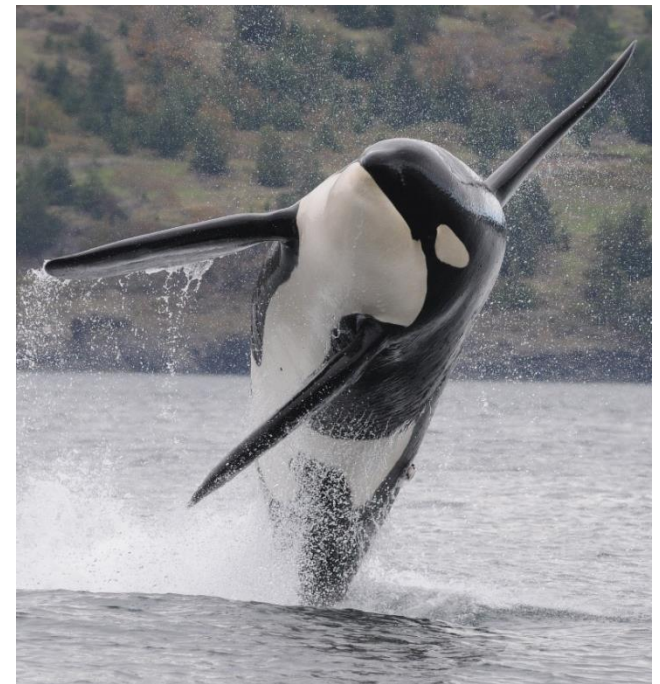
Recommendation # 6 (cont'd)

Hatchery pilot studies to increase marine survival rates and to potentially increase size and age of returns

Improved habitat for survival of both hatchery and wild stocks

Increased funding for operational, infrastructure, management and monitoring costs associated with increased production

Conduct ongoing adaptive management, five-year comprehensive reviews and the science to support sustained increase in production



Release Timing Studies

There has been a decline in smolt to adult survival (SAR%) since the 1980's.

Since the 1990's the release window for hatchery fish has become condensed to a few weeks in May and June.

- Concerns about density-dependent effects and predation
- Loss of diversity in release timing may result in more variable survival



Release Timing Studies

Studies are being conducted for 5 hatcheries

- Garrison Springs (Fall Chinook)
- Minter Creek (Fall Chinook)
- Hoodsport (Fall Chinook)
- Gorst Creek (Fall Chinook)
- Marblemount (Spring Chinook)
 - Tulalip Tribe has an on-going study at Bernie Gobin and Wallace River hatcheries (Summer Chinook)
 - Long Live the Kings has a study at Glenwood Springs Hatchery (Fall Chinook)





Southern Resident Orca Prey Production

SOUTHERN RESIDENT KILLER WHALE PRIORITY CHINOOK STOCKS REPORT

NOAA Fisheries West Coast Region
and
Washington Department of Fish and Wildlife

June 22, 2018



Priority Chinook Stocks Findings

Factor 1 – Observed Part of SRKW Diet

Factor 2 – Consumed During Reduced Body Condition or Diversified SRKW Diet

Factor 3 – Degree of Spatial and Temporal Overlap



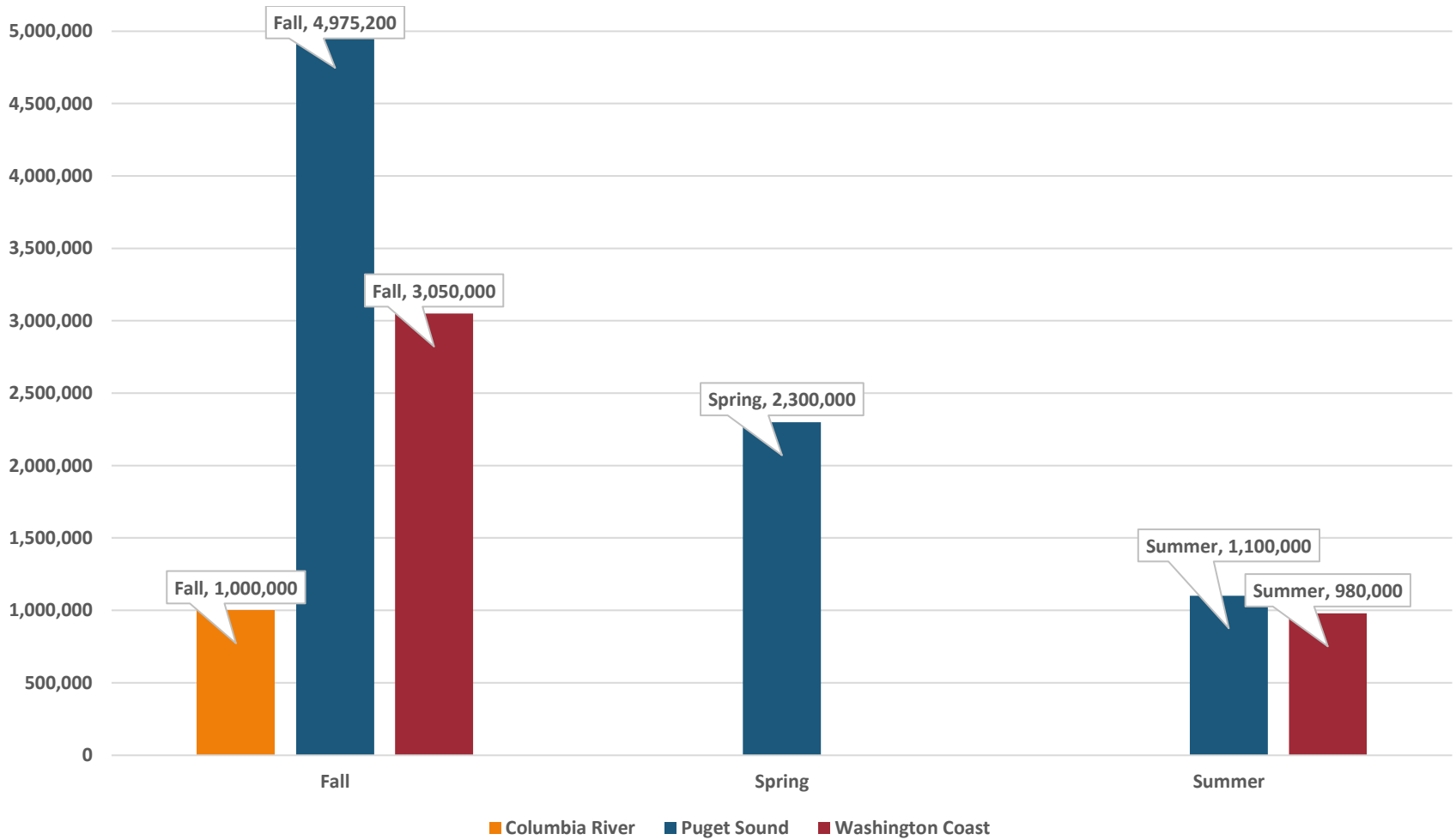
Priority Stocks

Priority Chinook Stocks Using Conceptual Model

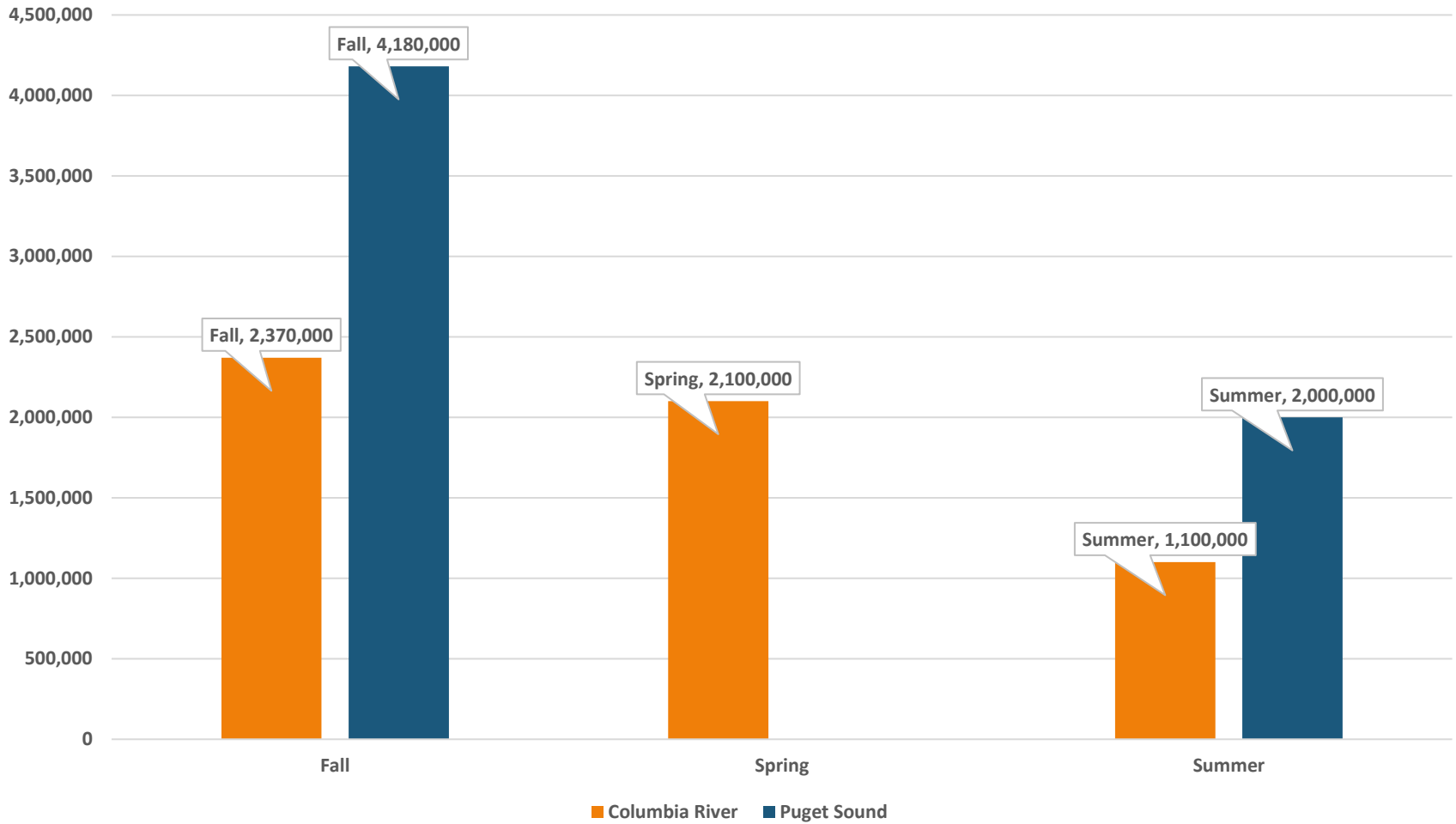
ESU / Stock Group	Run Type	Rivers or Stocks in Group	Diet Contribution Score (0,1)	Killer Whale Reduced Body Condition or Diverse Diet Score (0,1)	Spatio-Temporal Overlap Score (0 - 3)	Total Score (sum of factors)
			Avg. Factor 1 (see note)	Avg. Factor 2 (see note)	Avg. Factor 3	
Northern Puget Sound	Fall	Nooksack, Elwha, Dungeness, Skagit, Stillaguamish, Snohomish	1	1	3.00	5.00
Southern Puget Sound	Fall	Nisqually, Puyallup, Green, Duwamish, Deschutes, Hood Canal systems	1	1	3.00	5.00
Lower Columbia	Fall	Fall Tules and Fall Brights (Cowlitz, Kalama, Clackamas, Lewis, others)	1	1	2.63	4.63
Strait of Georgia	Fall	Lower Strait (Cowichan, Nanaimo), Upper Strait (Klinaklini, Wakeman, others), Fraser (Harrison)	1	1	2.63	4.63
Upper Columbia & Snake Fall	Fall	Upriver Brights	1	1	2.25	4.25
Fraser	Spring	Spring 1.3 (upper Pitt, Birkenhead; Mid & Upper Fraser; North and South Thompson) and Spring 1.2 (Lower Thompson, Louis Creek, Bessette Creek)	1	1	2.25	4.25
Lower Columbia	Spring	Lewis, Cowlitz, Kalama, Big White Salmon	1	1	2.25	4.25
Middle Columbia	Fall	Fall Brights	1	1	2.06	4.06
Snake River	Spring-Summer	Snake, Salmon, Clearwater	1	1	1.88	3.88
Northern Puget Sound	Spring	Nooksack, Elwha, Dungeness, Skagit (Stillaguamish, Snohomish)	1	1	1.88	3.88
Washington Coast	Spring	Hoh, Queets, Quillayute, Grays Harbor	1	1	1.69	3.69
Washington Coast	Fall	Hoh, Queets, Quillayute, Grays Harbor	1	1	1.69	3.69
Central Valley	Spring	Sacramento and tributaries	1	1	1.50	3.50
Middle & Upper Columbia Spring	Spring	Columbia, Yakima, Wenatchee, Methow, Okanagan	1	1	1.31	3.31
Middle & Upper Columbia Summers	Summer		1	1	1.31	3.31



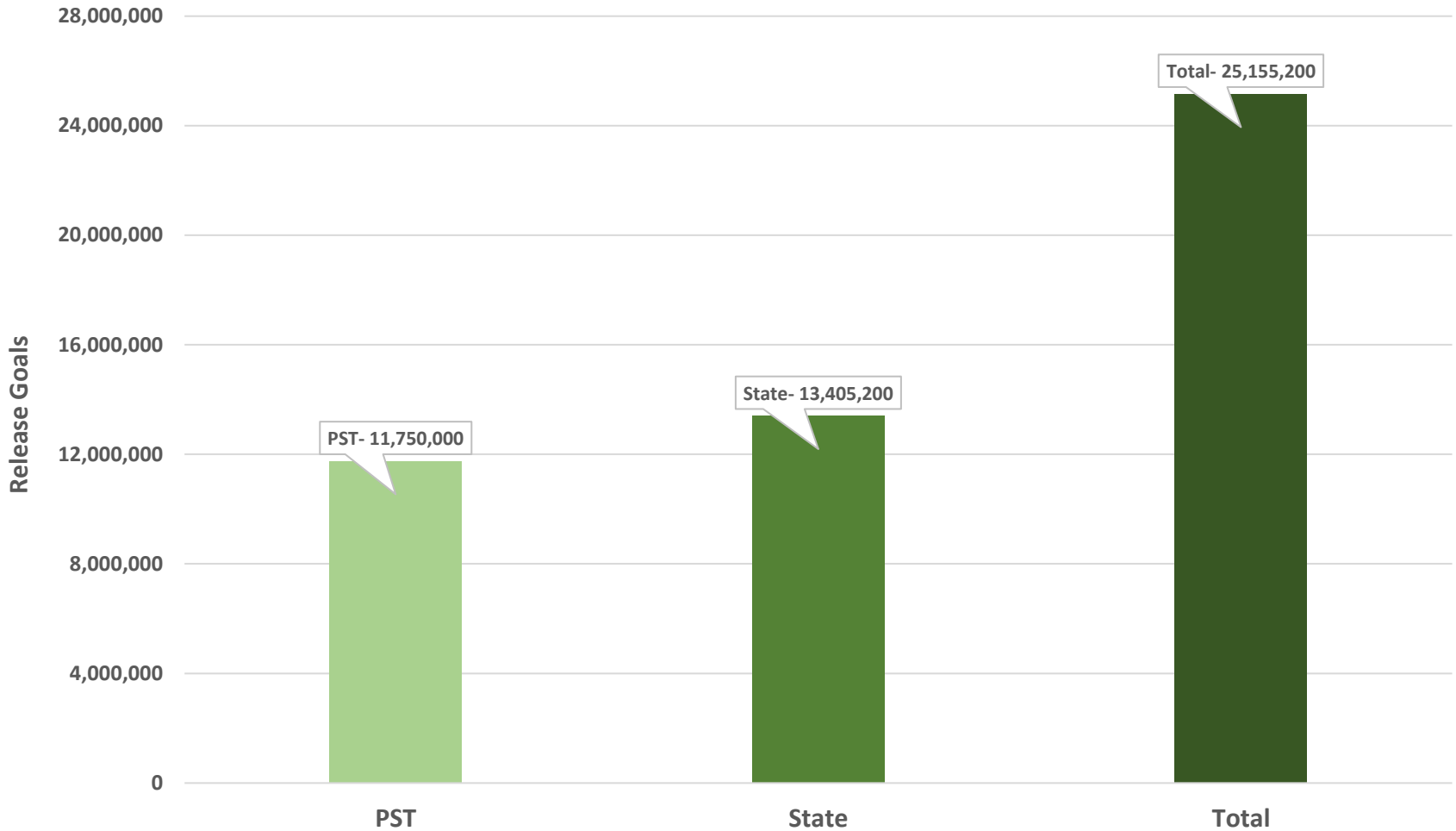
Planned State Funded SRKW Chinook (WDFW, Co-managers 2023 broodyear)



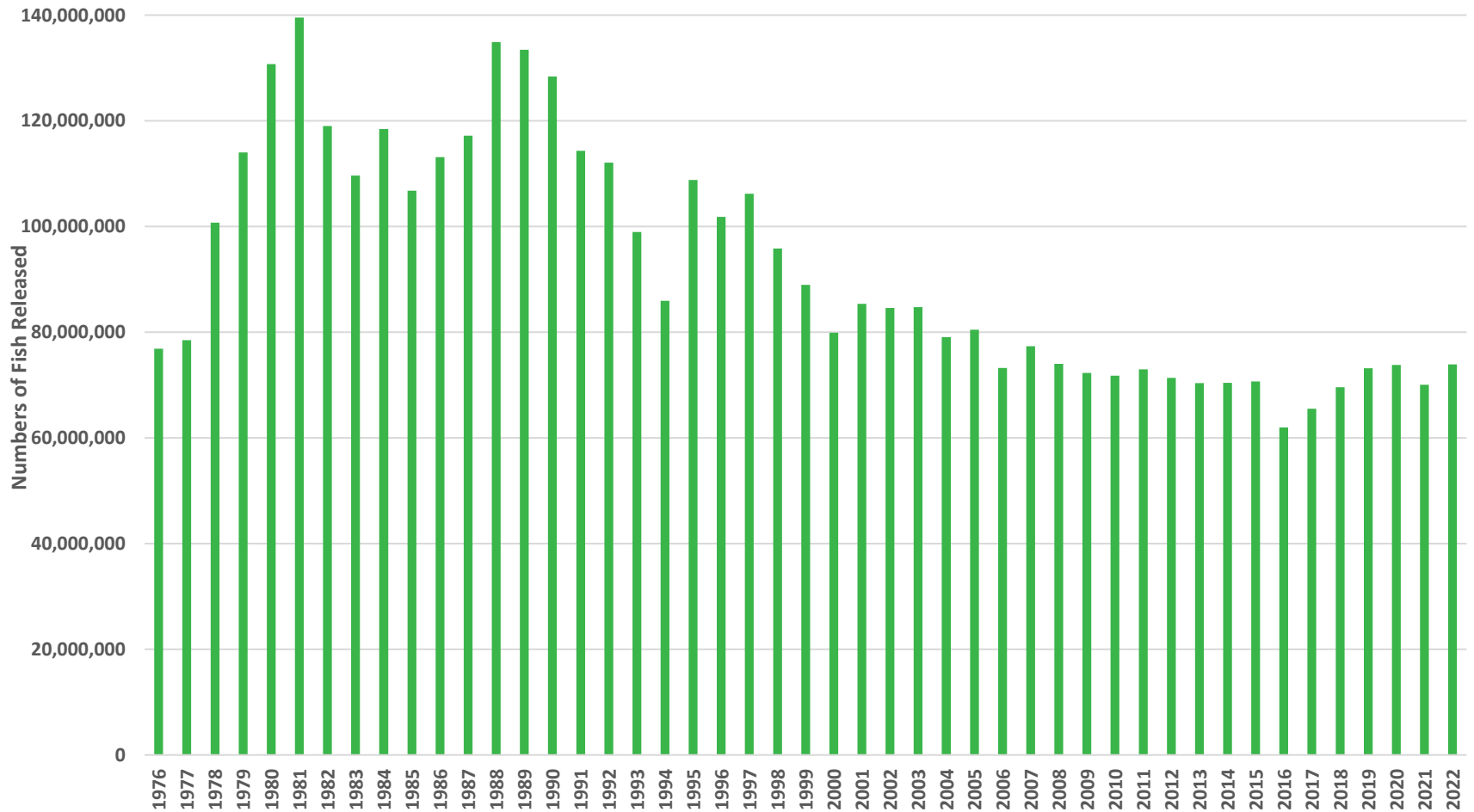
Planned PST Funded SRKW Chinook 2023 Broodyear



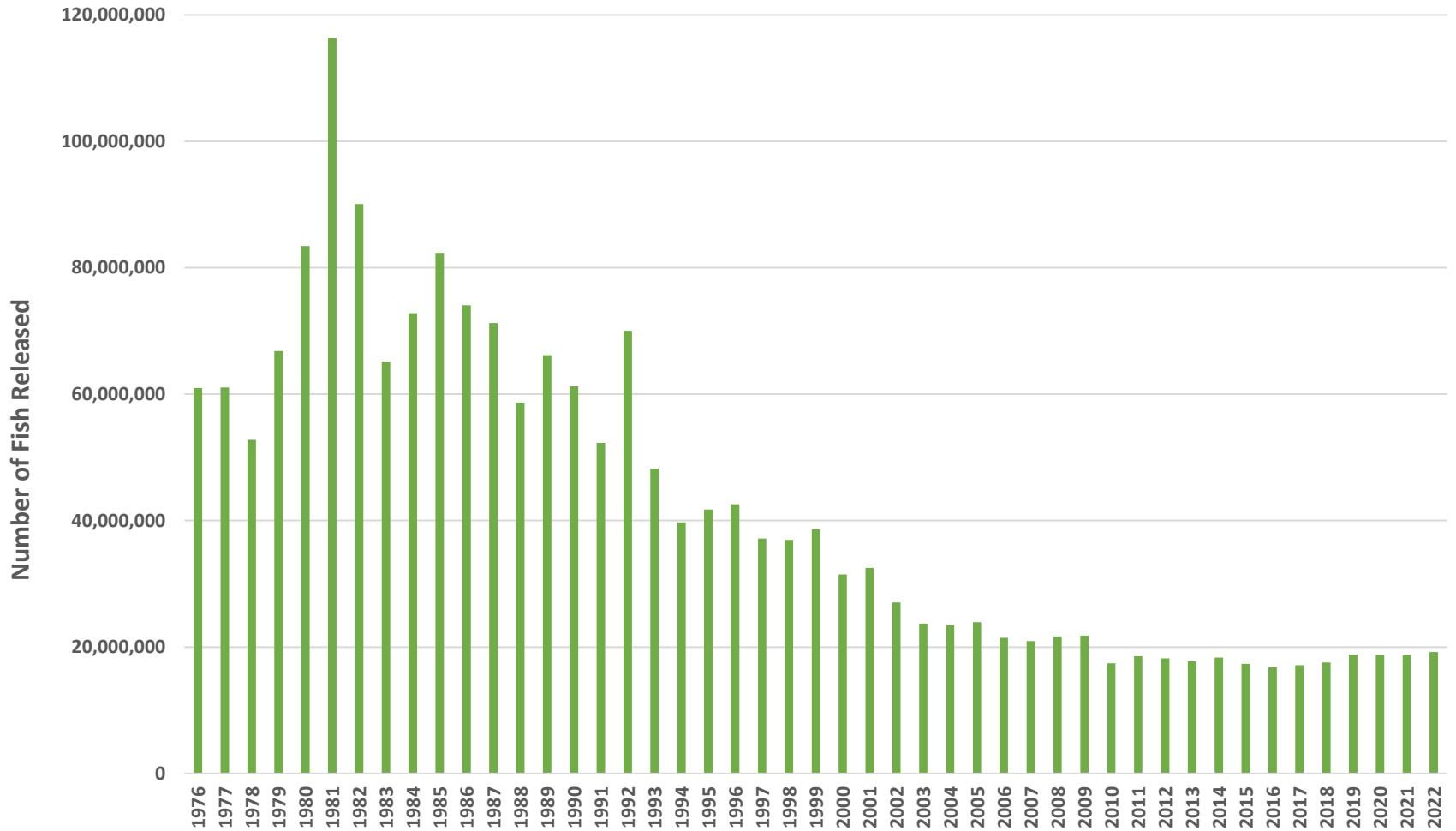
Overall Proposed Increases - CK



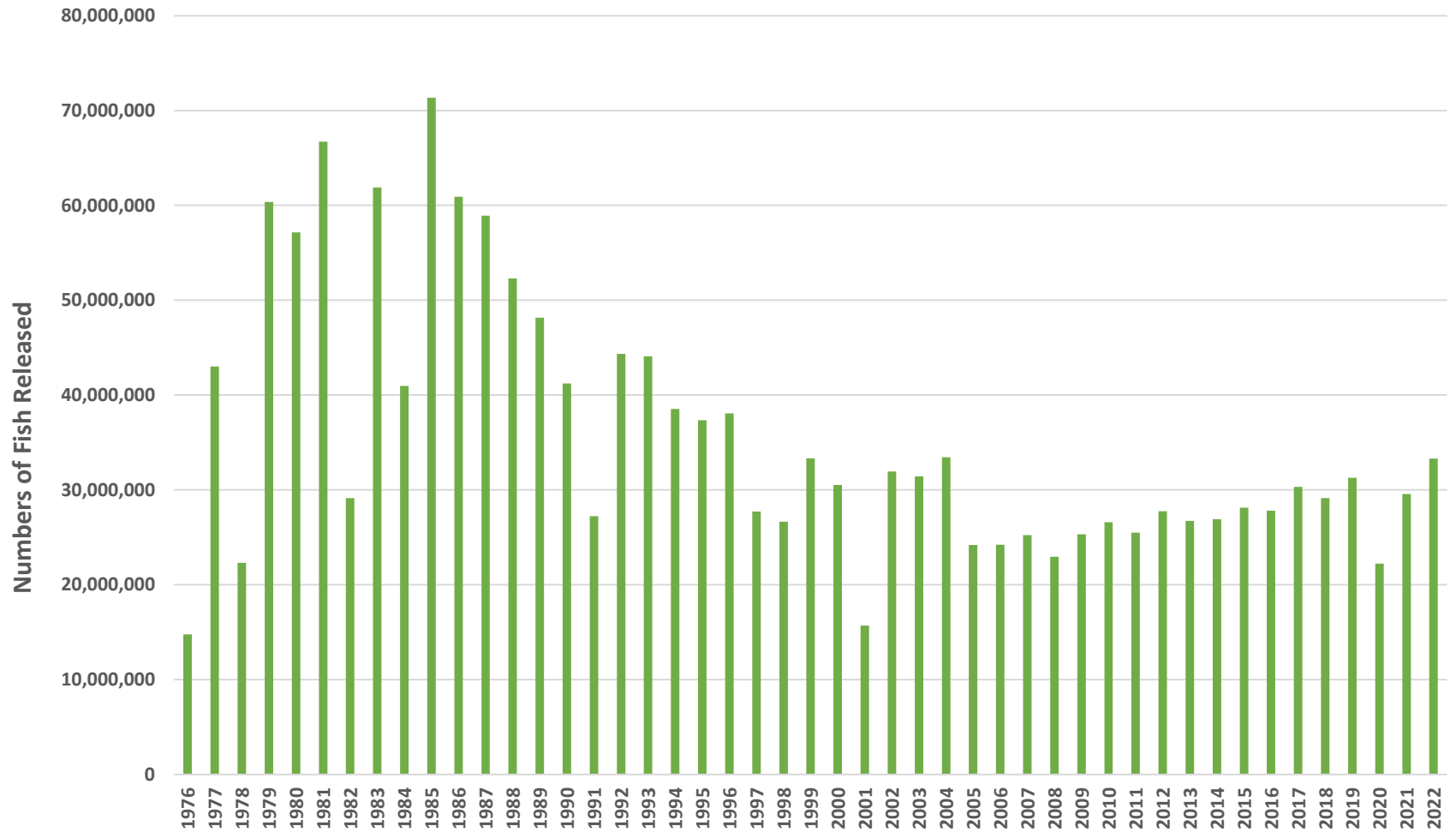
Chinook Production 1976-2022



Coho Production 1976-2022



Chum Production 1976-2022





SRKW Master Plan (Living Document)

SRKW Master Plan (Living Document)

Fiscal Year 2021 Proviso funding appropriation – \$500,000

Tasks

- Assess and prioritize hatchery improvements
- Develop plan to reach production goals in recommendation #6 of the Orca Task Force Report
- Prioritization given for a new Hatchery on the Cowlitz River
- Prioritized capital projects
- Short timeline for completion (6 months)
- Next steps



Current Schedule for Master Plan Projects

Projects	Increase	21-23	23-25	25-27	27-29	29-31	31-33	33-35	35-37	37-39	39-41	41-43	43-45	45-47	Grand Total	Region
Moving Forward																
*SRKW - New Cowlitz River Hatchery	6,600,000	300,000													300,000	Columbia
*SRKW - Kendall Creek Hatchery Modifications	700,000	4,317,000														Puget Sound
*SRKW - Sol Duc Hatchery Modifications	1,000,000	200,000	1,186,000	8,508,000											9,894,000	Coastal
SRKW Masterplan Phase 2			250,000												250,000	
SRKW Palmer Ponds Expansion	600,000		950,000	3,842,000											4,792,000	Puget Sound
SRKW Samish Hatchery Expansion	1,000,000		1,910,000	11,061,000												Puget Sound
Beaver Creek Hatchery Renovation/Expansion	2,000,000	135,000	2,696,000	15,862,000	13,010,000										31,703,000	Columbia
SRKW Lyons Ferry Hatchery Expansion	2,000,000				241,000		2,502,000	2,502,000							5,245,000	Columbia
															-	
Under Review																
*SRKW - Voights Creek Hatchery Expansion	1,000,000	3,551,000														Puget Sound
SRKW Hupp Springs Hatchery Expansion	650,000					93,000		1,238,000				8,184,000			9,515,000	Puget Sound
SRKW Humptulips Hatchery Renovation	2,000,000							149,000		1,746,000		13,122,000			15,017,000	Coastal
SRKW Coulter Creek Hatchery Expansion	500,000									710,000		3,393,000			4,103,000	Puget Sound
SRKW Whitehorse Hatchery Expansion	1,000,000											102,000	1,326,000	9,018,000	10,446,000	Puget Sound
Not Moving Forward																
SRKW Puyallup Hatchery Expansion	575,000			959,000	5,026,000										5,985,000	Puget Sound
SRKW Naselle Hatchery Expansion	2,000,000					129,000	1,487,000	10,338,000							11,954,000	Coastal
SRKW Nemah Hatchery Expansion	1,000,000					92,000		1,215,000		7,749,000					9,056,000	Coastal
SRKW Bogachiel Hatchery Expansion	2,000,000										160,000	1,844,000	7,051,000	7,051,000	16,106,000	Coastal
SRKW McKernan Hatchery Expansion	500,000							811,000	4,052,000						4,863,000	Puget Sound
SRKW Elwha Hatchery Expansion	2,000,000					121,000	1,445,000	9,624,000							11,190,000	Puget Sound
Current Production Maxed Out for ESA Coverage																
SRKW Wallace River Hatchery Expansion	1,000,000					89,000		1,201,000	7,835,000						9,125,000	Puget Sound
SRKW Marblemount Hatchery Expansion	2,000,000					121,000	1,457,000	4,933,000	4,933,000						11,444,000	Puget Sound
SRKW Dungeness Hatchery Expansion	1,000,000										250,000	2,618,000	11,063,000	11,063,000	24,994,000	Puget Sound
Total Production:	30,125,000															
Biennial Totals:		8,503,000	6,992,000	40,232,000	18,277,000	645,000	6,891,000	32,011,000	16,820,000	10,205,000	21,818,000	9,181,000	27,132,000	18,114,000	216,821,000	





Upcoming Workshop # 2

Risks and Benefits of Hatchery Production

Detailed discussion of hatchery production risks and benefits related to SRKW population dynamics

- Major reviews relevant to potential risks and benefits of increased production
- Risks and protections identified in Commission's 2018 Prey Initiative
- Additional reviews and findings on proposed hatchery production increases
- Marine mammal and fish experts assessments of risks and benefits of increased hatchery production



Questions?

