PugetSoundPartnership
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Action Agenda
Agenda Item #2

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Proposed Action: Briefing on action area profiles and priorities

Summary:
The legislation that created the Partnership established seven geographic action areas around the Sound to address problems specific to those areas as they relate to the ecosystem as a whole. In each action area, we are attempting to answer, "What do we need to do to move from where we are today toward a healthy Puget Sound?" The answer to this question is specific to each action area, and is based on the geographic and social makeup of the action area and the unique challenges it faces.

Over the past ten months, the Partnership has worked with regional scientists, policy experts, and concerned citizens in each action area to develop tailored solutions to their unique problems. We hosted community meetings to discuss the status of Puget Sound's health and understand key issues in each action area. We met to talk about action area threats and attempted to prioritize the most important, as well as tie those key threats to local actions. These discussions with the public have been supplemented by hard work by action area Regional Liaisons, Ecosystem Coordination Board representatives, and Leadership Council members who have been working with core members of their action area to refine priorities and provide more detail to the discussion. Partnership Salmon Liaisons have added key information on salmon recovery strategies, we've included information from a current inventory of Puget Sound activities, and we've looked to the Topic Forum papers for insight into discussions of each of the Partnership's goals.

We have synthesized this input into priority actions for inclusion in the action area profiles. These eight tables reflect the unique assets and challenges of each action area, as well as the unique actions the area should focus on to move toward recovery. The priority actions provide guidance for local jurisdictions in planning, and provide flexibility to allow locals to identify the most effective means of implementation. In most cases, the priorities affirm and support activities already underway in each action area. The Partnership has placed special emphasis in areas that may be particularly important for the Sound as a whole. It is important to view the profiles in relation to the overall Action Agenda as well as one another as they are intended to nest under the sound wide priorities.

The tables are not an exhaustive list of all threats or actions possible in an action area, but instead attempt to highlight key issues and provide a prioritized list of actions. The tables do not reflect overarching needs that every action area has identified as important such as the need for financial and technical assistance with compliance and enforcement, additional monitoring, regional funding and the rescue tug. The actions that need to be addressed regionally are in the main body of the Action Agenda.

These priority action tables are currently under review in each action area, and we expect to incorporate many of their changes and suggestions before release of the draft Action Agenda.

Action Area Priorities– Strait of Juan de Fuca Action Area

Ecosystem benefits provided by Action Area	Local pressures to ecosystem benefits (key threats are bold)	Priority Action Area Strategies

• Exchange of fresh and marine waters helps Puget Sound from becoming stagnant
• Migration corridor for fish, bird and marine mammal species along nearshore.
• Rare and unique upland species of birds, plants, and animals.
• Functioning pristine high elevation habitat (Olympic National Park)
• Forest lands: Timber and pulp production, soil & water retention in uplands, cultural resource for basketry, carving.
• Agricultural production with an extended growing season
• Shellfish production
• Recreation and tourism, especially Olympic National Park, Dungeness National Wildlife Refuge, Olympic Discovery Trail, numerous local parks and beaches, and community events throughout the Strait from Neah Bay to Fort Worden.
• Rainshadow effect draws retirement communities
• Marine vessel passage, shipping and marine trades
	Habitat Alteration
	• **Blocked habitat**: Over 70 miles of mainstem and tributaries are blocked; 95% of historic Chinook habitat blocked by Elwha dam system
	• Nearshore alterations: 14% shoreline armored, stretching from Point Wilson to Elwha; 1439 overwater structures; 1.8 miles of railroad along marine shoreline
	• **Loss of working farms and forests through conversion**
	• Loss of estuary habitat and pocket estuaries
	• Disruption of river processes through dikes, riparian development, and vegetation removal; historic land divisions enables development in sensitive habitat areas.
	
	Pollution
	• **Toxics and nutrients:** Port Angeles Harbor contamination, including Rayonier Mill site contamination; CSO events (69 in 2007)
	• **Contamination at Warmhouse Beach Open Dump site threatens water, health**
	• **High fecal coliform levels in lower Dungeness River, and Dungeness and Discovery Bays have resulted in shellfish closures**
	
	Surface/Groundwater Impacts
	• **Water shortages for people and instream uses**
	  ○ WRIA 17: low summer flows
	  ○ WRIA 18 & 19: low summer flows, extreme high flows
	  ○ Neah Bay has critical shortages
	  ○ Instream flows not yet established
	• **Major alteration of flows in Elwha and Dungeness Rivers**
	
	Invasive Species
	• Japanese knotweed, reed canary grass, and butterfly bush infestations along riparian corridors
	
	Artificial propagation
	• Not identified
	
	Harvest
	• Strait salmon runs are heavily impacted by Canadian harvest
	
	Localized climate change impact
	• Sea level rise: loss of tidal flats, complete loss of Dungeness Spit, loss of 58% of estuarine and ocean beaches
	
	Other
	• Increase in population by 2030: 8% in Clallam County (more than 5,000 people) and 33% in Jefferson County (more than 8,500 people) (numbers being verified)
	• Harmful algae blooms: seasonal or occasional shellfish bed closures from paralytic shellfish poisoning and amnesic shellfish poisoning
		A: Work together as a system on priority actions
		• Coordinate planning and implementation: Start with shorelines, land use, and water supply planning
		• Coordinate protection and restoration actions identified in major plans. Start with Salmon Recovery, water supply, and marine nearshore plans
		• Coordinate the Port Angeles Harbor and Rayonier cleanup actions
		
		B: Protect Intact Ecosystem Processes, Structures and Functions
		• Establish and maintain instream flows for WRIAs 17, 18, and 19
		• Implement 2514 plans for WRIAs 17, 18, and 19
		• Maintain working forest, agricultural and shelllfish lands
		• Complete Critical Area Ordinance update (City of Sequim)
		• Complete SMP updates (Clallam County, Port Angeles, Sequim, Jefferson County)
		
		C: Restore Ecosystem Processes, Structures and Functions
		• Complete Elwha River System Restoration Project
		• Implement Salmon Recovery three-year workplans for WRIAs 17, 18, 19
		• Implement existing Marine Resource Plans
		• Implement Forest Practices Habitat Conservation Plans
		• Implement Road Maintenance & Abandonment Plans
		• Implement Conservation District Work Plans
		• Implement Dungeness River management plans
		• Restore instream flows in the Dungeness and other flow limited basins
		
		D. Reduce Sources of Water Pollution
		• Implement existing TMDL and other water quality plans in Dungeness and Discovery Bays
		• Clean up and restore Port Angeles Harbor and waterfront a coordinated way
		• Close and remediate the Makah Tribe Warmhouse Beach Open Dump and develop a solid waste transfer and reuse facility
		• Update and implement Stormwater Management Plans and Codes (Clallam County, City of Sequim)
		• Implement Carlsborg Urban Growth Area Wastewater Treatment and Water Reuse strategy
		• Implement Sequim-Dungeness and East Jefferson Clean Water District Strategies
		• Implement NPDES permits

Action Area Priorities– North Central Action Area

Ecosystem benefits provided by Action Area	Local pressures to ecosystem benefits (key threats are bold)	Priority Action Area Strategies

• Nearshore habitat serves as salmon refugia for several salmon populations
• Shellfish production
• Recreation: Boating, state parks, shoreline access
• Water-oriented communities
• Accommodate significant amount of future population growth
• WSF maintenance facility at Eagle Harbor (Bainbridge)
• Commerce, military, and marine transportation hub
• Homeland security – Key port Naval Undersea Warfare Center, Puget Sound Naval Shipyard
• Regional leadership in water quality improvements via "pollution identification and control"
	Habitat Alteration
	• **Conversion of working farms and forest for urban and suburban uses**
	• 12% impervious surface
	• **Nearshore alterations:** 49% shoreline armored, especially in south part of action area and Bainbridge Island; 291 piers and docks, 108 boat ramps on Bainbridge Island
	
	Pollution
	• Bacteria contamination from human and animal waste, CSO events and urban stormwater
	  o threatened and closed shellfish growing areas
	  o 7 local streams closed for human contact
	• Poor flushing leads to low dissolved oxygen in bays
	• Groundwater contamination resulting from Eagle Harbor superfund site
	• Hundreds of acres of contaminated sediments, especially at Sinclair and Dyes inlets, Liberty Bay, and Eagle Harbor attributed to naval and industrial activities
	
	Surface/Groundwater Impacts
	• **Limited water availability for people and instream uses**: streamflows dependent on precipitation and groundwater; 80% of drinking water comes from groundwater WRIA 15: Low summer flows, winter flash flows
	
	Invasive Species
	• Spartina, non-native tunicates (?)
	
	Artificial propagation
	• High proportion of hatchery salmon in marine and fresh waters have unknown impacts on wild salmon
	
	Harvest
	• Not specifically identified
	
	Localized climate change impact
	• Sea level rise: Loss of beach land by 2050, converted to tidal flats
	
	Population/Other
	• Population growth 43% in 20 years (+100,000 people) *need to verify*
		A: Work together as a system on priority actions
		• Continue to improve Kitsap County and Bainbridge Island salmon recovery coordination for implementation
		• Continue coordination among West Sound Watersheds
		• Integrate nearshore and marine efforts (e.g., Shoreline Master Program updates) with watershed recovery efforts (e.g., Critical Areas Ordinance updates, Salmon Recovery Plan).
		
		B: Protect Intact Ecosystem Processes, Structures and Functions
		• Implement Vision 2040 plan and coordinate growth planning with transportation
		• Protect remaining intact nearshore habitat
		• Manage lands and runoff to ensure plentiful and clean groundwater recharge
		• Complete Shoreline Master Program updates (Gig Harbor, Bremerton, Kitsap County)
		• Complete Critical Area Ordinance updates (Port Orchard)
		
		C: Restore Ecosystem Processes, Structures and Functions
		• Implement Salmon Recovery three-year workplans
		• Complete Chico Creek restoration
		
		D. Reduce Sources of Water Pollution
		• Continue and expand preventive approaches to stormwater management
		  o Continue and expand pollution identification and control (PIC) program
		  o Use and increase site-appropriate LID techniques to manage for future planned growth
		• Reduce bacteria contamination in shellfish growing areas and streams
		• Implement water conservation and reclaimed water development and use
		• Implement NPDES permits
		• Control sources of pollution that affect contaminated sediment sites
		• Focus education and outreach activities to reduce pollution from live-aboards, boating and water-based activities

Action Area Priorities – Hood Canal Action Area

Ecosystem benefits provided by Action Area	Local pressures to ecosystem benefits (key threats are bold)	Priority Action Area Strategies
• Skokomish River is largest salmon producing river in West Sound • Unique summer chum salmon species spawns only in Hood Canal and Eastern Strait of Juan de Fuca • Forest lands: Timber production, soil & water retention in uplands, wildlife habitat • Internationally renowned shellfish from Quilcene, Dabob, Hama Hama; also prawn and Dungeness crab harvest • Recreation: boating, sailing, water skiing, diving, camping, hunting, Olympia National Park • Fishing: sport fishing, commercial fishing, tribal fishing and shellfishing including salmon, geoduck, crab, oysters, clams, and shrimp • Vacation residences • Hood Canal Bridge provides transportation linkage between Kitsap and Olympic Peninsulas • Water and/or power supply for City of Bremerton, Lilliwaup, Port Townsend, City of Tacoma • US Navy Submarine Base at Bangor • Skokomish Tribal reservation • Port Gamble S'Klallam Tribal Reservation	**Habitat Alteration** • Blocked habitat: particularly habitat in North Fork of Skokomish blocked by Cushman dam • Alteration of Skokomish River form and function from structures such as Hwy 106, Hwy 101, and the diking network throughout the valley • Loss of estuary habitat and pocket estuaries • **Loss of flood storage capacity:** altered flow regimes in Skokomish River; flood plain disconnection and alteration of tributaries and flood channel network within the Skokomish Valley • Loss of working farms and forests through conversion and habitat modifications • **Disruption of marine shoreline processes:** 59 miles of roads and extensive homes, bulkheads and shoreline armoring including altered sediment supply and freshwater inputs **Pollution** • **Pollutant loading leads to low dissolved oxygen (dead zones) & shellfish closures – Sources:** inadequate/failing septic systems,,nutirent loading from land use and development, logging practices, salmon carcasses • Mill site in Port Gamble Bay **Surface/Groundwater Impacts** • Limited water availability for people and instream uses o WRIA 16 and 17: low summer flows, extreme high flows **Invasive Species** • Tunicates, Japanese knotweed, reed canary grass, Hosweed, yellow flag iris, purple loosestrife **Artificial Propagation** • High salmon hatchery production has potentially negative impacts on wild salmon; Legacy broodstock management issues resulting from out-of-basin fish **Localized climate change impacts** • Sea level rise: loss of estuarine beaches **Other** • Harmful algal blooms and biotoxins: seasonal or occasional shellfish bed closures • Increase in population by 2030: 12% in Kitsap, Mason and Jefferson counties (more than 36,000 people)	**A: Work together as a system on priority actions** • Work collaboratively to develop and implement actions to respond the dissolved oxygen problem in Hood Canal. Hood Canal Coordinating Council and Hood Canal Dissolved Oxygen Program in particular should integrate efforts. • Improve coordination and collaboration of existing watershed groups to improve implementation efficiency and effectiveness. • Integrate and prioritize existing capital project lists for habitat and water quality. Find efficiencies between the two major efforts and integrate into local programs such as Shoreline Master Plan Programs. **B: Protect Intact Ecosystem Processes, Structures and Functions** • Protect working forests throughout the Hood Canal watershed, particularly on the Tahuya Peninsula • Complete Shoreline Master Program updates for Mason, Jefferson, Kitsap Counties • Complete Critical Areas Ordinances updates for Mason, Kitsap and Jefferson Counties • Develop water resources management plans *Checking on this one* • Continue development and implementation of watershed management plans *checking on this* **C: Restore Ecosystem Processes, Structures and Functions** • Implement salmon recovery plans including Hood Canal Summer Chum, Skokomish Chinook, and Hood Canal Chinook • Complete Skokomish Delta Estuarine Restoration Project • Decommission, stabilize, and maintain USFS and private logging roads. **D. Reduce Sources of Water Pollution** • Repair or replace poorly functioning/failed onsite systems: north and south shores of Hood Canal, Union to Belfair and Belfair to Point Ayres; Adopt DOH On Site System Management Program • Complete planned sewer projects (Belfair, Skokomish/Potlach/Hoodsport, Paradise Bay, Dosewallips State park, Brinnon public facilities) • Implement shellfish district plans (East Jefferson County Shellfish District) • Update & implement Stormwater Management Plans and Codes (Mason, Jefferson, Kitsap) • Implement Skokomish River TMDL [*Checking on this need*] **E. Other** • Continue to monitor and make public aware of harmful algal blooms events

Action Area Priorities– South Sound Action Area

Ecosystem benefits provided by Action Area	Local pressures to ecosystem benefits (key threats are bold)	Priority Action Area Strategies
• Nisqually River is largest undeveloped delta in Puget Sound, important for salmon and wildlife; largest National Wildlife Refuge in Puget Sound • Nursery area for multiple Chinook populations • Areas of intact shoreline • Unique prairie habitat with endemic species • Some forest lands • Nationally renowned shellfish; one of the largest shellfish producing areas in state • Recreation: clamming, crabbing, Mt. Rainier National Park, kayaking, boating • Numerous commercial and residential centers • Center of government • Hydropower for City of Centralia and City of Tacoma • Regional leadership in reclaiming municipal wastewater • Ports of Olympia and Shelton • Homeland security: Fort Lewis & McCord Air Force Base	**Habitat Alteration** • **Nearshore alterations:** 40% shoreline armored; __ miles of BNSF rail along eastern shoreline, Loss of riparian and estuary habitat, some intertidal alterations • **Blocked habitat: dams on Deschutes and Nisqually Rivers; fill for I-5 on Nisqually**. • Loss of prairie habitat through land conversion • Loss of hydrologic function from existing and expanding impervious surface **Pollution** • **Industrial pollution in bays and contaminated sediments**: Oakland Bay, Chambers Bay, Budd Inlet • **Pollutant loading leads to low dissolved oxygen**: Budd Inlet, Case Inlet, Carr Inlet • **Bacteria and pathogens from human and animal waste** • Poor air quality due to particulate pollution (wood smoke, diesel emissions, etc.) **Surface/Groundwater Impacts** • Low flows in WRIA 12; flow issues in WRIA 13 **Invasive Species** • *Need to identify* **Artificial propagation** • Potential ecosystem impacts related to some aquaculture practices • High proportion of hatchery salmon in South Sound nearshore and marine waters have unknown impacts on wild salmon **Harvest** • *Need to identify* **Localized climate change impact** • Sea level rise: Significant loss of estuarine beaches potentially sooner than other areas of Puget Sound; inundation of tidal flats; flooding at downtown Olympia **Population/Other** • Conflicting use values of marine shorelines • Increase in population by 2030: 33%; more than 310,000 people, in Thurston, Pierce, Mason counties	**A: Work together as a system on priority actions** • Continue recent collaborative work in watershed coordination • Integrate nearshore and marine efforts (e.g., Shoreline Master Program) with watershed recovery efforts (e.g., Critical Areas Ordinances, Salmon Recovery Plan). • Improve efficiency in implementing numerous water quality plans **B: Protect Intact Ecosystem Processes, Structures and Functions** • Protect undeveloped shoreline • Complete and implement Shoreline Master Program updates • Complete and implement Critical Area Ordinances (Thurston County) • Develop and implement conservation and recovery plans for prairie dependent species **C: Restore Ecosystem Processes, Structures and Functions** • Complete restoration of Nisqually estuary • Restore shorelines where feasible • Implement Salmon Recovery three-year workplans (WRIAs 10/12, 11, 13/14, 15) **D. Reduce Sources of Water Pollution** • Proactively avoid water pollution threats to protect shellfish growing areas, especially western South Puget Sound • Clean up industrial pollution in Budd Inlet, Oakland Bay, and Chambers Bay • Implement Watershed Action, Shelllfish Protection District, and other water pollution cleanup plans in a coordinated way • Address poorly functioning/failed onsite systems throughout South Puget Sound; prioritize areas with shellfish production, low dissolved oxygen, and high nutrient and pathogen loading • Continue and expand LOTT Alliance water reuse facilities • Implement NPDES permits • Continue and expand preventive approaches to stormwater management **E. Other** • Reopen key shellfish producing areas in North Bay, Oakland Bay, Henderson Inlet, Burley Lagoon • Maintain Nisqually hatchery operations to conserve Chinook species • Implement Ecology guidelines for geoduck aquaculture • Resolve shoreline use conflicts

Action Area Priorities – South Central Action Area

Ecosystem benefits provided by Action Area	Local pressures to ecosystem benefits (key threats are bold)	Priority Action Area Strategies
• Unique salmon populations: Lake Sammamish Kokanee; spring White River Chinook; summer and fall North Lake Washington and Cedar River Chinook, steelhead • Lake Washington sockeye and Issaquah Creek Chinook provide recreational harvest opportunities • Core area for bull trout recovery (Puyallup/White) • Functioning pristine high-elevation habitat in Mt. Rainer National Park • Significant agriculture & rural areas • Modest timber production • Recreation: Mount Rainer National Park; Mount Baker-Snoqualmie National Forest; Lake Washington, Lake Tapps, Lake Sammamish, Mountain to Sound Greenway • Population center for Puget Sound (more than three million residents); Significant growth will occur in this area • Water supply for City of Seattle and City of Tacoma and much of the surrounding metropolitan areas; many water supply watersheds are protected • Commercial & industrial hub, generating 63% of the gross state product • Home of the North Pacific fishing fleet • International port facilities (Tacoma and Seattle) and cruise ship terminal	**Habitat Alteration** • **Nearshore alterations:** 75% shoreline armored • **Major loss of estuary habitat in Duwamish and Puyallup River estuaries** • **Significant alteration of rivers, floodplains and shorelines**; **river straightening and channelization** (Duwamish, Puyallap, Cedar); floodplain development. Loss of floodplain storage • **Extensive alteration of surface hydrology**: Lake Washington, Ballard Locks, White, Cedar, Puyallup and Black Rivers • Blocked habitat: dams and diversions (Green, White, Puyallup) • Significant diversion of water through wastewater system to Puget Sound • Loss of working farms and forests through conversion • 12% impervious surface; significantly higher in urbanized areas **Pollution** • Legacy toxics: Duwamish and Commencement Bay Superfund sites; • Recontamination of previously cleaned up sites • **Major source of urban stormwater runoff an pollutants in Puget Sound** • Contribution of bacterial pollution from agricultural runoff • Significant source of air pollution • Failing septic systems in nearshore areas and throughout watersheds **Surface/Groundwater Impacts** • WRIAs 8,9,10/12: low summer flow; high peak stream flows; low mainstem winter flows • **Increased future water needs for higher population** • Localized areas of saltwater intrusion into groundwater **Invasive Species** • Japanese knotweed, reed canary grass, and butterfly bush infestations along riparian corridors; non-native fish species in Lake Washington for recreational harvest **Harvest** • *Need to identify* **Artificial Propagation** • Hatchery salmon production in Lake Washington/Sammamish and White rivers have potentially negative effects on wild salmon; legacy broodstock management issues resulting from out-of-basin fish **Localized climate change impact** • Significant source of Puget Sound carbon emissions • Sea level rise: Risk of conversion of upland to shoreline; loss of estuarine beaches; limited impacts in Tacoma **Other** • Increase in population by 2030: 22% in King, Pierce, Snohomish counties (more than 660,000 people)	**A: Work together as a system on priority actions** • Continue to encourage tribal participation in South Central action area recovery efforts • Integrate resource planning at watershed scale (WRIA 8, WRIA 9, Puyallup/Commencement Bay watershed) across water quality, water quantity & salmon recovery—including updates to Critical Area Ordinances and Shoreline Master Programs. • Continue to advance regional cooperation in South Central Puget Sound **B: Protect Intact Ecosystem Processes, Structures and Functions** • Implement Vision 2040 plan and coordinate growth planning with transportation • Protect working farms and forests consistent with the Action Agenda • Complete Shoreline Master Program updates (King and Pierce Counties, all relevant cities) • Implement Habitat Conservation Plans consistent with the Action Agenda (forest & fish plans, Cedar, Green, Tacoma) • Complete Critical Area Ordinance updates (all relevant cities) • Permanently protect high priority marine, estuarine and freshwater habitats to support critical resources and protect intact ecosystems • Provide water for instream uses and people: Complete regional water supply planning process *needs verification*; implement instream flow agreements; promote water conservation; investigate reclaimed water use **C: Restore Ecosystem Processes, Structures and Functions** • Implement Salmon Recovery three-year workplans for WRIAs 8, 9, 10/12 • Implement existing basin protection and restoration plans in Pierce County • Implement large-scale floodplain reconnection projects to restore habitat and protect public safety • Provide fish passage at Howard Hanson Dam on Green River, Electron Dam on the Puyallup River and Buckley Diversion dam on the White River • Set levees back along the Puyallup, White and Carbon Rivers to allow for restoration of natural riverine functions **D. Reduce Sources of Water Pollution** • Implement Superfund cleanup at contaminated sites (Duwamish River, Commencement Bay) • Implement significant stormwater retrofits for water quality (& quantity) • Targeted education towards reducing stormwater pollutants, endocrine disrupters and pharmaceuticals • Implement NPDES permits • Implement existing clean water plans and TMDLs in a coordinated way • Implement Pierce, King and Snohomish county Onsite Management Plans **E. Other** • Continue hatchery production for species conservation in White River • Continue Kokanee conservation planning and implementation

Action Area Priorities – Whidbey Action Area

Ecosystem benefits provided by Action Area	Local pressures to ecosystem benefits (key threats are bold)	Priority Action Area Strategies
• Major Chinook producing rivers in Puget Sound: Skagit, Stillaguamish, Snohomish systems; major producer of Coho in Puget Sound and west coast. • Core bull trout populations • Important hake spawning area (Port Susan) • Three large estuaries; migratory cross-roads for many salmon populations; significant bird habitat; some of the largest eelgrass beds in Puget Sound • Significant freshwater input from large rivers • Functioning pristine high-elevation habitat, including North Cascades National Park, Alpine Lakes, Wild Sky, Glacier Peak Wilderness • Strong agriculture base: dairy, flowers, vegetables, berries, nursery • Shellfish and crabbing industries • Recreation: sport fishing, boating, whale watching, camping, skiing, North Cascades National Park and wilderness areas • Tourist attractions at small waterfront communities • Significant employment and population centers, including rural water-connected communities (Camano, Whidbey Islands) • Timber industry including pulp • Regional power generator: hydropower for western Washington power grid; Sultan River provides water supply for Everett; potential tidal power • Port of Everett • Homeland security; Whidbey Island Naval Air Station; Naval Station Everett - home of the USS Abraham Lincoln	**Habitat Alteration** • **Loss of estuary tidal marsh and habitat connectivity:** More than 80% of the Snohomish, and approximately 75% of the Skagit and 85% of the Stillaguamish estuaries have been diked, cutting off tidal marshes and blind tidal channels. • Loss of nearshore habitat quality and complexity: 38% of marine shoreline armored; over 5,000 overwater structures; 5.6 miles of railroad grade; disconnected feeder bluffs and pocket estuaries, development in sensitive areas, loss of riparian forests. • Loss of large river habitat complexity and floodplain connectivity: diking, riparian clearing, and floodplain development have reduced wood debris jams, side-channels, forested islands and pools. • **Decreasing forest cover and increasing impervious surface:** 16% increase in impervious surface in Snohomish watershed from 1991-2001, loss of over 39,000 acres of wetlands (only 18% of historic remain), clearing and conversion of working forestland in foothills and Puget lowlands resulting in altered basin hydrology and degraded habitat. **Pollution** • **Nutrient loading**: high concern for eutrophication and presence of "dead zone" in Penn Cove, Saratoga Passage, Possession Sound • Dissolved oxygen, bacteria and temperature concerns found in streams throughout action areas: 48% of impaired waters listed due to bacterial pollution • **Pollutants from urban stormwater and agricultural runoff** **Surface/Groundwater Impacts** • **Low summer flows in WRIAs 5 &7 for fish and human uses resulting from loss of forest cover, increased impervious surface, over-allocation of groundwater resources, and climate change.** • Altered magnitude, frequency and duration of peak flow events in WRIAs 3, 4, 5 &7 from decreased forest cover, decreased wetland storage and increased impervious surface. • Altered flows in Skagit and Sultan Rivers below dams. • Increase freshwater demand with more people, resulting in decreased aquifer levels and decreased groundwater discharge **Invasive Species** • Pocket hotspots of invasive species (Japanese knotweed, Spartina) **Artificial Propagation** • Multiple hatcheries reduce genetic fitness of wild populations; increase competition and predation. **Harvest** • *Need to identify* **Localized climate change impacts** • Sea level rise: significant change and loss of estuarine habitat in Snohomish, Stillaguamish, and Skagit estuaries; significant loss of Whidbey Island beaches; risk of salt water intrusion **Other** • **Increase in population by 2030:** 31% in Skagit, Island, Snohomish counties (over 240,000 people *verify*	**A: Work together as a system on priority actions** • Integrate Salmon Recovery and Marine Resources Committee plans to find efficiencies • **Continue to work cooperatively with farming community to develop a coordinated restoration strategy that balances the needs of agriculture and fish (all three basins)** • Complete tidal energy investigations and review with regional ecosystem priorities and needs • Sustain collaborative efforts to identify and prioritize protection and restoration projects in the Skagit Watershed **B: Protect Intact Ecosystem Processes, Structures and Functions** • Protect groundwater and critical aquifer recharge areas. • Protect working farms and forests consistent with the Action Agenda • Complete and implement Shoreline Master Program, Critical Area Ordinances (Island County, Skagit County, Coupeville), and Comprehensive Plans **C: Restore Ecosystem Processes, Structures and Functions** • Implement Salmon Recovery three-year work plan (WRIAs 3, 4, 5, 6, 7): focus on estuary, nearshore and mainstem river restoration • Complete large scale estuarine restoration projects in Skagit, Stillaguamish, Snohomish to restore over 2,500 acres of tidal marsh. • Implement large-scale floodplain reconnection projects to reconnect side-channels and provide mainstem rivers room to migrate. • Implement Western Washington Agricultural Association's Skagit Delta Tidegates and Fish Initiative • Implement Forest Practices Habitat Conservation Plans • Implement Road Maintenance & Abandonment Plans **D. Reduce Sources of Water Pollution** • Develop and implement immediate strategy to address potential dead zone • Continue and expand preventive approaches to stormwater management: use and increase site-appropriate LID techniques to manage for future planned growth • Begin stormwater retrofits in Everett • Implement existing TMDL plans • Implement NPDES permits

Action Area Priorities– Whatcom Action Area

Ecosystem benefits provided by Action Area	Local pressures to ecosystem benefits (key threats are bold)	Priority Action Area Strategies
• Two unique spring run Chinook populations in Nooksack River • Cherry Point: historically significant herring spawning area • Forage fish habitat • Migratory bird habitat • Agriculture: Significant dairy industry (ranks in top 5 dairy regions nationally), berries • Shellfish aquaculture and Dungeness crab fishery • Pristine high alpine habitat at Mt. Baker National Park • Recreation: Mount Baker, North Cascades, rafting, hiking, kayaking, Birch Bay, Lake Whatcom • Rural communities • Proximity to recreation draws outdoor enthusiasts to reside in area • Lake Whatcom watershed provides water for half of Whatcom County • Port of Bellingham • Gateway to Canada	**Habitat Alteration** • **Loss of mainstem and floodplain river habitat** • Loss of forest cover resulting in landslides • Nearshore alterations: 36% shoreline armored • Blocked habitat: culverts and dams disrupt hydrology and/or block habitat • Loss of native eelgrass meadows due to shoreline modification and dredging in inner Bellingham Bay • Some loss of Samish Bay eelgrass to provide for shellfish aquaculture **Pollution** • **Nutrients and pathogens from livestock waste lead to shellfish closures**: Drayton Harbor, Portage Bay, Chuckanut Bay • **Industrial pollution in bays**: Bellingham Bay includes toxics, metals, PAHs, nutrients • Low dissolved oxygen, mercury and phosphorous in Lake Whatcom **Surface/Groundwater Impacts** • Low instream flows and many established instream flows not being met **Invasive Species** • *Need to identify* **Artificial propagation** • Fall Chinook hatchery production has potential negative impacts on native spring-run Chinook **Harvest** • Nooksack Chinook salmon runs are heavily impacted by Canadian harvest **Localized climate change impact** • Sea level rise: loss of swamp, marsh and estuarine beach in Nooksack Delta **Population/Other** • Increase in population by 2030: 30%, more than 50,000 people	**A: Work together as a system on priority actions** • Continue to work cooperatively with farming community to find watershed restoration solutions that maintain farming habitat • Continue to develop cooperative cross-agency coordination and implementation • Integrate nearshore and marine efforts (e.g., pollution clean up, Shoreline Master Program, Cherry Point Marine Managed Area) with watershed recovery efforts (e.g., Critical Areas Ordinances, Instream Flow Action Plan, Salmon Recovery Plan). • Prioritize local stormwater actions across existing plans **B: Protect Intact Ecosystem Processes, Structures and Functions** • Implement forest stewardship plan • Complete Critical Area Ordinance updates (Blaine) • Implement Shoreline Master Program • Support working farms and farm stewardship, including nutrient management • Improve regulatory enforcement and compliance for agricultural areas • Implement Instream Flow Action Plan • Complete Cherry Point Management Plan for Marine Managed Area **C: Restore Ecosystem Processes, Structures and Functions** • Implement Salmon Recovery 3-year workplan for WRIA 1 • Remove fish passage barriers on Nooksack (Middle Fork Nooksack Dam, Canyon Creek Blockage) **D. Reduce Sources of Water Pollution** • Continue to clean up Bellingham Bay and revitalize waterfront community (Bellingham Bay Pilot Program); Implement contaminated sediment TMDL • Clean up Drayton Harbor and Portage Bays: Implement Shellfish Protection Plans; complete other water quality plans in a coordinated way • Implement Lake Whatcom, Birch Bay and Bellingham Bay Comprehensive Stormwater Management Plans • Continue and expand preventive approaches to stormwater management: Use and increase site-appropriate LID techniques • Implement stormwater retrofits in Bellingham • Implement Shellfish Protection plans • Address poorly functioning/failed onsite systems • Implement TMDL plans: Lower Nooksack Basin, Johnson Creek, Lake Whatcom • Implement NPDES permits **E. Other** • Continue to support conservation hatchery for South Fork Nooksack Chinook

Action Area Priorities – San Juan Action Area

Ecosystem benefits provided by Action Area	Local pressures to ecosystem benefits (key threats are bold)	Priority Action Area Strategies
• Nearshore habitat for 22 populations of migrating Chinook salmon, supporting Orca populations and marine birds • Extensive forage fish spawning habitat • Rich diversity of marine life & marine habitats • Boutique agriculture industry • Shellfish industry and crab fishery • Recreational fishing and crabbing • Recreation: Moran State Park, American & English Camp, Lime Kiln Park, Turtleback Mountain, Lopez Hill • Vacation residences • Local & international tourist destination (whale watching, kayaking, biking, boating) • Pinto abalone at risk of extinction	**Habitat Alteration** • **Nearshore alterations:** limited soft shoreline sensitive to modification; 11 of 27 historical pocket estuaries at risk of degradation • Loss of eelgrass habitat • Potential threat from derelict fishing gear **Pollution** • Inadequate waste management to handle summer influx of visitors • Localized pollutant loading from stormwater runoff (e.g., Friday Harbor, ferry landings) • Boater pollution in bays and marinas • Poorly treated wastewater from Victoria B.C. outfall • Potential for localized oil spills **Surface/Groundwater Impacts** • **Saltwater intrusion into drinking water supply (San Juan Island, Lopez)** • **Limited water availability for people and instream uses:** groundwater dependent system is vulnerable to groundwater pollution from *septic systems and alterations to surface flow* • High future water demand **Invasive Species** • Tunicates, Japanese seaweed, purple varnish clams **Artificial Propagation** • Unknown impact on wild salmon from hatchery salmon in marine waters surrounding San Juan Islands **Harvest** • Commercial and recreational harvest rates of salmon and groundfish in the San Juan Islands may reduce recovery potential **Localized climate change impact** • Sea level rise and ocean acidification due to climate change are occurring—their immediate and longer-term impacts are not well understood. **Other** • Population doubles in summer months • Increase in year-round population by 2030: 38%, more than 5,000 people	**A: Work together as a system on priority actions** • Implement stewardship and outreach programs focused on protection and prevention with residents and tourists • Integrate the objectives of San Juan Marine Stewardship Plan, the Shoreline Master Program and Critical Areas Ordinances so that they are consistent. **B: Protect Intact Ecosystem Processes, Structures and Functions** • Implement San Juan Marine Stewardship Area Plan • Implement San Juan Initiative recommendations • Complete Critical Area Ordinance update (San Juan County) • Complete Shoreline Master Program update (San Juan County) • Protect existing nearshore habitat and processes • Protect existing surface and ground water • Maintain local oil spill response programs • Identify and quantify impacts from derelict fishing gear **C: Restore Ecosystem Processes, Structures and Functions** • Implement Salmon Recovery three-year workplan for WRIA 2 • Restore nearshore habitat **D. Reduce Sources of Water Pollution** • Update and implement Stormwater Management Plans and Codes (San Juan County) • Implement Low Impact Development for new development **E. Other** • Implement local aspects of Orca Recovery Plan, including whale watching plan •