Appendix B: Habitat Restoration Strategy

Key Focus Areas for 2021-2016

Introduction

This Habitat Restoration Strategy (HRS) describes those actions and activities which shall be the focus of TEP's implementation efforts during the five-year period, 2021-2026. Additional Comprehensive Conservation and Management Plan (CCMP) Action Items may be implemented by partners or may be reconsidered for TEP implementation should unanticipated opportunities arise.

More details on each CCMP Action Item referenced in this HRS may be found in Chapter 2 (Habitat Restoration Action Plan) of TEP's 2019 CCMP, which includes the need for restoration efforts (why), objectives/goals (what), project leads (who), timing (when), activities, anticipated costs, sources of funding, and performance measures (how). Estuary and watershed profiles for TEP's focus areas may be found in Chapter 4 of the CCMP.

This HRS encompasses:

- Prioritized CCMP Action Items based on impact, relevancy, funding, and resources
- Key Restoration Activities (Table B-1)
- Goals and Measurable Objectives – Outputs and Outcomes (Table B-2)
- Links between Climate Preparedness and this Restoration Strategy (Table B-3)

Performance measures shall be included in the Monitoring Strategy described in Appendix C. Results will be reported via annual GPRA (NEPORT) reports, TEP annual reports/meetings, State of the Bays reports, social media updates, and EPA Performance Evaluations.

Prioritized CCMP Action Items for 2021-2026

To develop the prioritized actions and project types included in the HRS, TEP enlisted the expertise of its staff, Board of Directors, and key partners during the revision of TEP's CCMP. The following priorities are based on this expertise and guided by the most current and relevant science-based literature available. The literature utilized to determine priorities include local and regionally focused action plans, limiting factors analysis, ESA recovery plans, and conservation strategies. Links to many of these references may be found in the Introduction to TEP's 2019 CCMP (page v).

Prioritized actions include (i) assessment activities, which allow TEP to remain current in ecological trends and fill critical data gaps, and (ii) conservation and restoration actions that ensure meaningful change on the ground to benefit key native species. Of particular conservation focus in the Pacific Northwest is the recovery of Pacific salmonids. TEP's efforts to recover these stocks focus primarily on habitat quality and availability that, when improved, increase the likelihood of creating positive population trends across our focal area. These habitat and water quality improvements and the specific mechanisms for creating them also benefit a myriad of other sensitive native species and reduce the prevalence of non-native competitors.

While all of the actions incorporated in TEP's 2019 CCMP are critically important to TEP's overarching goal and remain a focus, TEP has chosen the following HRS priorities to maximize the level of ecological uplift attainable during the next five years given the staff and funding resources available. TEP is committed to evolving its priorities over time to align with the best available science and management practices.

Assessment and Prioritization

HAB-01 Assess and prioritize estuarine habitats.
HAB-03 Assess and prioritize instream habitats.
HAB-04 Assess and prioritize riparian habitats.

Conservation and Restoration

HAB-06 Conserve and restore key habitats in the estuary.
HAB-07 Conserve and restore key habitats in the lower watershed.
HAB-09 Maximize ecosystem connectivity to ensure a landscape array of ecosystem processes and ease of species movement.
HAB-10 Provide genetically appropriate native vegetation and promote its use among habitat restoration and enhancement partners.

Species *Focus*

HAB-11 Assess, prioritize, and enhance key native species.
HAB-12 Assess, prioritize and manage non-native species.

Key Restoration Activities for 2021-2026

Table B-1 highlights TEP's key restoration activities which are designed to satisfy the CCMP actions prioritized in the HRS. Included in the table are the names of each project and unique identification codes useful in referencing them throughout this Appendix B. For each project, primary tasks are listed with an estimate of the timeframe during which they will be complete along with the CCMP actions that each project will address, the likely partners involved, and an estimate of the total costs to complete the key activities. Cost estimates align with those used in TEP's Anatomy of a CCMP Action (see the 2019 CCMP Introduction, page xviii).

Goals and Measurable Objectives for 2021-2026

Table B-2 lists the key measurable objectives (outputs) associated with each project and the long-term goals (outcomes) TEP hopes to achieve by carrying out the effort. Outputs consist of project deliverables such as acres restored or plants planted. Outcomes focus on changes to ambient conditions, ecological functions, and biological populations (e.g. current status and trends in water quality, health and abundance of habitats and living resources). These definitions for outputs and outcomes are in accordance with the EPA's "National Estuary Program - Program Evaluation Guidance" logic model.

Links Between Climate Change Preparedness and Restoration Strategy

Table B-3 illustrates how TEP's priority projects listed in the HRS achieve meaningful progress towards the actions called for in TEP's climate vulnerability assessment and adaptive management strategy. The first two columns list the specific climate change preparedness strategy/potential actions and their relative priority (low, medium, high) as indicated in TEP's 2019 CCMP. In the following columns, each project identified in the HRS is listed by its respective identification code. An "x" in the box denotes that a particular HRS project directly or indirectly contributes to the achievement of the actions identified in TEP's vulnerability assessment.

Table B-1 Key Restoration Projects and Activities for 2021-2026

More information on each CCMP Action and on Partner acronyms may be found in Chapter 2 and Appendix A of TEP's 2019 CCMP, respectively. Cost: $= <$25,000; $$= $25,000 to $99,999; $$$= $100,000 to $499,999; $$$$= >$500,000.

Key Restoration Activities	Y 1	Y 2	Y 3	Y 4	Y 5	CCMP Actions	Partners	Cost
Tillamook River Wetlands (TRW1)								
Manage completion of final design and permitting	x	x				HAB-06, -09, -11, -12	NCLC, TCPWD, USFWS, USFS, ODFW, TU, DU, CTSI, TSA, Stimson	$$$
Fundraising through grant writing		x	x					$
Manage implementation restoration activities				x	x			$$$$
Southern Flow Corridor (SFC1)								
Develop scopes of work, funding needs	x					HAB-06, -09, -11, -12	Tillamook County, OSU	$
Fundraising through grant writing		x						$
Manage implementation of restoration activities			x					$$$
Sitka Sedge (SS1)								
Develop scopes of work, funding needs	x					HAB-06, -09, -11, -12	OPRD, NNSLWC, USFS, TCPWD, TDM, ODFW	$
Fundraising through grant writing	x	x						$
Manage completion of final design and permitting	x	x						$$$
Manage implementation of restoration activities			x	x				$$$$
Salmon SuperHwy Culvert Replacements (SSH1)								
Ongoing involvement in planning through participation on executive and technical committees	x	x	x	x	x	HAB-07, -09, -11, -12	SSH, NNSLWC, USFWS, TCPWD, USFS	$
Manage design and implementation of habitat enhancement projects	x	x	x	x	x			$$$
Native Plant Nursery (NPN1)								
Source and grow native plant materials	x	x	x	x	x	HAB-10	Approx. 40 regional restoration partners	$$$
Distribute native plant materials to regional restoration partners	x	x	x	x	x			$
BackYard Planting Program (BYPP1)								
Develop scopes of work, funding needs	x	x	x	x	x	HAB - 04, -06, -07, -09, -10, -11, -12	TCSWCD, NNSLWC, LNWC, SSH	$
Fundraising through grant writing	x	x	x	x	x			$
Manage BYPP to develop project designs	x	x	x	x	x			$$$
Manage BYPP to implement restoration activities	x	x	x	x	x			$$$
Implement top priority projects from Coho SAPs in Tillamook and Nestucca Watersheds (COHO2)								
Develop scopes of work, funding needs				x	x	HAB-06, -07, -09, -11, -12	USFS,NNSLWC, SSH, TCSWCD, TCPWD, ODFW, NRCS, ODF, Private Timber, landowners	$
Fundraising through grant writing				x	x			$
Manage design and implementation of habitat enhancement projects					x			$$$

Table B-2 Goals and Measurable Objectives for 2021-2026

Key restoration activities from Table B-1 are repeated in Table B-2.

Key Restoration Activities	**Outputs** *"Deliverables"*	**Outcomes** *To restore and maintain the ecological integrity of estuaries of national significance.* *Fishable/Swimmable Waters*
Tillamook River Wetlands (TRW1)		
Manage completion of final design and permitting Fundraising through grant writing Manage implementation restoration activities	Tidal wetland acres reconnected and restored	Improved rearing habitat for salmonids; improved wintering and breeding habitat for migratory bird species; improved biological and structural diversity; improved climate change resilience
Southern Flow Corridor (SFC1)		
Develop scopes of work, funding needs Fundraising through grant writing Manage implementation of restoration activities	Tidal wetland acres restored	Improved rearing habitat for salmonids; improved wintering and breeding habitat for migratory bird species; improved biological and structural diversity; improved climate change resilience
Sitka Sedge (SS1)		
Develop scopes of work, funding needs Fundraising through grant writing Manage completion of final design and permitting Manage implementation of restoration activities	Tidal wetland acres reconnected and restored	Improved rearing habitat for salmonids; improved wintering and breeding habitat for migratory bird species; improved biological and structural diversity; improved climate change resilience
Salmon SuperHwy Culvert Replacements (SSH1)		
Ongoing involvement in planning through participation on executive and technical committees Manage design and implementation of habitat enhancement projects	Number of culverts replaced; miles of stream habitat reconnected	Improved salmonid spawning access and habitat availability, expanded ecosystem connectivity; improved hydrologic functioning of watersheds/estuaries; expanded wildlife corridors, improved biological and physical processing; climate change resilience
Native Plant Nursery, including seed collection (NPN1)		
Source and grow native plant materials Distribute native plant materials to regional restoration partners	Number of native plants distributed for restoration; acres/stream miles planted; quantity of plant materials collected and produced	Preservation of the local diversity and genetics of coastal plant communities
BackYard Planting Program (BYPP1)		
Develop scopes of work, funding needs Fundraising through grant writing Manage BYPP to develop project designs and implement restoration activities	Number of acres/stream miles planted with native species; number of acres/stream miles treated for invasive species; number of landowners engaged	Improved riparian conditions and ecological functioning; reduction of pollutants and improved water quality
Implement top priority projects from Coho SAPs in Tillamook and Nestucca Watersheds (COHO2)		
Develop scopes of work, funding needs Fundraising through grant writing Manage design and implementation of habitat enhancement projects	Acres or miles of restoration	Improved habitat conditions for key project species

Table B-3 Climate Change Preparedness and Restoration Strategy Crosswalk for 2021-2026

* "Priority from VA" refers to the Vulnerability Assessment conducted by TEP and its partners in preparation for the 2019 CCMP (see Chapter 4, Table 5, pp. 105-110). The final two columns have been left blank intentionally to allow for the inclusion of additional projects in the future.

		Restoration Strategy Activities for 2021-2026								
Priority from VA*	**Climate Change Preparedness Strategy/Potential Actions**	**TRW1**	**SFC1**	**SSS1**	**SSH1**	**NPN1**	**BYPP1**	**COHO2**		
	Agricultural management									
Medium	Improve draining function of lower tidal wetlands through restoration, thereby improving productivity of upland agricultural areas	x		x						
	Improvement to infrastructure									
High	Identify culverts and roads most at risk of failure from high flows (esp. those culverts with insufficient capacity)	x		x	x			x		
	Replace or remove culverts and roads most at risk	x			x			x		
Medium	Reduce miles of unmaintained forest roads by fully decommissioning (remove culverts, pull back unstable slopes, reduce landslide risk)	x			x			x		
	Identify and prioritize areas for restoration									
High	Identify sites where gravel deposits and downed wood might enhance the fish habitat							x		
	Identify areas and prioritize by estuarine and freshwater type. Freshwater wetlands expected to be more vulnerable under drought scenarios.							x		
	Protect existing habitat									
High	Protect existing healthy riparian vegetation, which provides shade	x	x	x	x	x	x	x		
	Restore wetlands and floodplains									
High	Restore floodplain connectivity for freshwater and tidally influenced wetlands and examine underlying influence on hydrology	x	x	x			x			
	Riparian restoration in stream related wetlands	x	x	x			x			
Medium	Planting and restoration of wetlands with species that are better adapted to climate variability	x	x	x		x	x			
	Habitat improvement									
High	Large woody debris (LWD) to collect gravels for more subsurface flow and assist catching landslide material				x		x	x		
	Riparian plantings	x	x	x	x	x	x	x		
	Floodplain habitat restoration	x	x	x	x	x	x	x		
	Reconnect springs, wetlands, floodplains that can serve as cold water refugia	x	x	x	x			x		
Medium	Increase diversity of habitat to create more salmonid life history options	x	x	x	x			x		
	Increase off-channel habitat	x	x	x			x	x		
	Stream channel restoration to create more channel complexity	x		x	x					
	Expand conservation and restoration activities to ensure maintenance of specific types of wildlife habitat	x	x	x	x	x	x	x		
	Large scale, holistic floodplain management to maintain and enhance complexity and function	x	x	x		x	x	x		
	Address warming caused by inline impoundments						x			

Table B-3 Climate Change Preparedness and Restoration Strategy Crosswalk for 2021-2026

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		Restoration Strategy Activities for 2021-2026								
Priority from VA*	**Climate Change Preparedness Strategy/Potential Actions**	**TRW1**	**SFC1**	**SSS1**	**SSH1**	**NPN1**	**BYPP1**	**COHO2**		
Low	Setback dikes to increase channel width and improve floodplain function	x		x						
	Increase natural upland water storage									
Medium	Promote beaver habitat in the uplands	x	x	x			x	x		
	Reduce impacts of new and existing development on estuaries									
High	Replace/remove/remediate existing infrastructure and development vital to estuary conservation and ecological functioning over long timeframe	x		x	x			x		
	Assess and manage for projected change									
High	Using sea level rise study/report, assess culverts, dikes, other infrastructure, and areas at risk				x			x		
	Protect/restore/conserve areas that will become new habitat with sea level rise	x	x	x			x			
Medium	Develop/use models to view stream and estuary conditions 50-100 years out (for planning current and near future actions)							x		
	Education and outreach to promote appropriate standards to all groups (landowners, agencies, Counties, etc.)					x	x			
	Assess precipitation standards for culverts and roads (e.g. 100-year storms) based on climate projections and review current standards				x					
	Prioritize, replace, remove, and remediate based on the results of the study				x					
	Manage streamflow									
Medium	Sustainable water storage and release						x			
	Improve riparian planting survival									
High	Plant diverse species in riparian area	x	x	x		x	x			
	Replant riparian areas as needed					x	x			
	Increase forest diversity and resilience									
High	Replant with multiple tree species to preserve and enhance diversity	x	x	x		x	x			
	Reduce greenhouse gas emissions									
Medium	TBD – reduce greenhouse gas emissions	x	x	x			x			
	Develop appropriate vegetation management actions if changes detected									
Medium	Change in the type of vegetation used in riparian restoration activities					x	x			
	Continue with current management strategies and monitor for changes									
Medium	Maintain Riparian Management Areas (RMAs) strategies					x	x			