

**Table 2
General Restoration and Protection Opportunities in Grant County and Surrounding Cities and Towns**

Restoration / Protection Opportunities	Key Impairments*	Key Benefits to Ecological Functions*	Columbia River	Crescent Bay and Lake Roosevelt	City of Grand Coulee (Crescent Bay)	City of Grand Coulee (Lake Roosevelt)	Banks, Osborn, Thompson Lakes	Town of Coulee City (Banks Lake)	City of Electric City (Banks and Osborn Bay Lakes)	City of Grand Coulee (Banks Lake)	Coffee and Long Lakes	Blue Lake	Alkali, Deep, Dry Falls, Lenore, and Little Soap Lakes	Park Lake	Soap Lake	City of Soap Lake (Soap Lake)
			A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Establish riparian buffers where absent and/or remove invasives where present	Loss of nutrient and organic inputs, reduced evapotranspiration and bioinfiltration	Riparian vegetation recruitment	SIAC, HR-CCP, GCPUD	SIAC	SIAC	SIAC	BLRMP	SIAC, BLRMP	BLRMP	SIAC, BLRMP	SIAC		SIAC		SIAC
			Increased habitat for aquatic and terrestrial species foraging/breeding/nesting/migration													
2	Concentrate and better manage recreation and public access to intact riparian, wetland, and shrub-steppe habitats	Habitat loss - riparian and wetland	Riparian vegetation recruitment for native terrestrial species foraging/breeding/nesting habitat	SIAC, GCPUD				BLRMP		SIAC, BLRMP	BLRMP			CBWAMP	CBWAMP	
			Temperature/dissolved oxygen improvements													
			Improve toxin/pathogen management capabilities						BLRMP							
3	Incorporate aquatic habitat complexity and vegetation with future development along with soft bank stabilization techniques	Habitat loss along shoreline	Maintained or increased habitat for aquatic species – rearing/migration	SIAC, GCPUD				SIAC			SIAC	SIAC	SIAC	SIAC	SIAC	SIAC
		Increased wave energy due to shoreline armoring	Reduced soil erosion						SIAC	SIAC						
4	Implement stormwater controls consistent with Eastern WA Stormwater manual	Fertilizer/Pesticide/Herbicide inputs	Reduced excess nutrient sources to improve water quality	SIAC	SIAC	SIAC	SIAC		SIAC, BLRMP	SIAC, BLRMP	SIAC, BLRMP	SIAC	SIAC	SIAC		SIAC
		Temperature increases	Temperature/dissolved oxygen improvements													
		Bioaccumulation of toxins	Toxin/pathogen reduction													
5	Restore shrub-steppe along shorelines	Habitat loss - shrub-steppe	Increased native shrub-steppe habitat for terrestrial species foraging/breeding/nesting/migration	SIAC, HR-CCP, GCPUD				BLRMP	BLRMP	BLRMP	BLRMP	SIAC				
6	Protect intact shrub-steppe habitat	(none)	Increase native shrub-steppe habitat for terrestrial species foraging/breeding/nesting/migration	HR-CCP, GCPUD	SIAC	SIAC	SIAC	BLRMP	SIAC, BLRMP	SIAC, BLRMP	SIAC, BLRMP	CBWAMP	CBWAMP	CBWAMP		SIAC
7	Protect steep slope areas from runoff and sedimentation	Sediment cycle disruption	Increased subsurface infiltration and flow, protect surface water quality		SIAC	SIAC	SIAC			SIAC						
			Reductions in soil erosion													
8	Monitor shoreline periodically and evaluate protection measures if grazing impacts appear	NA	Riparian vegetation recruitment			N/A	N/A	BLRMP	N/A	N/A	N/A	SIAC				N/A
			Protections for temperature/dissolved oxygen conditions and protection against toxin/pathogen addition													
9	Protect existing wetland and riparian habitats	NA	Protections for temperature/dissolved oxygen conditions and protection against toxin/pathogen addition	HR-CCP, GCPUD				CBWAMP, BLRMP	BLRMP	BLRMP	BLRMP			CBWAMP	SIAC	SIAC
			Protection for aquatic and terrestrial species - foraging/greeding/nesting/rearing													
10	Grass or woody plant strips between agricultural fields and either lakes or streams	Habitat loss	Soil erosion protection			N/A	N/A		N/A	N/A	N/A					N/A
			Support native grassland and shrub steppe features													
			Increase habitat for terrestrial species - foraging/breeding/nesting/migration													
11	Concentrate livestock water access, including exclusion fencing if feasible	NA	Reductions in soil erosion			N/A	N/A	BLRMP	N/A	N/A	N/A					N/A
			Riparian vegetation recruitment													
			Protections for temperature/dissolved oxygen conditions and protection against toxin/pathogen addiiton													

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				A	B	C	D	E	F	G	H	I	J	K	L	M	N	
12	Manage nutrient and temperature loading at nearby hatchery	Effluent inputs - nutrient sources and elevated temperature water	Decrease nutrient sources															
		Temperature increases	Improved temperature/dissolved oxygen and protect against elevated toxin/pathogen conditions															
			Aquatic species - rearing/migration															
13	Evaluate opportunities for existing hardened shoreline/ armoring removal and native vegetation replanting with soft shoreline stabilization.	Habitat loss	Terrestrial and aquatic species - foraging/breeding/nesting/migration/rearing	GCPUD		SIAC			SIAC	SIAC							SIAC	
		Increased wave energy due to shoreline armoring	Decrease soil erosion															
		Sediment cycle disruption	Riparian vegetation recruitment															
14	Substrate enhancement	Sediment cycle disruption due to periodic flooding and ice dams	Decrease sedimentation/excessive deposition															
15	Reconnect floodplain and/or wetland connectivity where appropriate	Habitat fragmentation	Increased water storage	HR-CCP														
		Reduced water storage, and reduced filtration of sediment, nutrient-, toxin-, or pathogen-laden water	Increased subsurface infiltration and flow, protect surface water quality					BLRMP	BLRMP	BLRMP	BLRMP							
		Habitat loss	Increased hyporheic exchange and groundwater recharge															
		Sediment and organic material cycle disruption	Terrestrial and aquatic species - foraging/breeding/nesting/migration/rearing															

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Restoration / Protection Opportunities	Key Impairments*	Key Benefits to Ecological Functions*	Trail, Billy Clapp, and Brook Lakes	Sand Coulee Syphon, Round Lake, and Un-named Lake	Ephrata and Rocky Ford Lakes	Babcock Ridge Lake, Crater Lake, Frenchman Hills Lake, Hiawatha Lake, Martha Lake, Sand Lake, Un-named Lakes, Winchester Lakes	Moses Lake	Ancient Lake, Burke Lake, Dusty Lake, Evergreen Reservoir, Flat Lake, Hilltop Lake, Quincy Lake, Stan Coffin Lake	Potholes Reservoir	Blythe Lake, Canal Lake, Chukar Lake, Corral Lake, Crescent Lake, Hampton Lake, Heart Lake, Long Lake (South), Lower Goose Lake, Marsh Unit One, North Teal Lake, Pit Lakes, Royal Lake, Soda Lake, South Teal Lake, South Warden Lake, Susan Lake, Un-named Lake in T17-0N R29-0E S34, Upper Goose Lake, Warden Lake, Windmill Lake	Bobby Lake, Burkett Lake, Lenice Lake, Nunnally Lake, Red Rock Lake, Sand Hollow Lake	Un-named Lake in T15 0N R23 0E S 28, Saddle Mountain Lake, Saddle Mountain Wasteway	Lind Coulee	Lower Crab Creek	
			O	P	Q	R	S	T	U	V	W	X	Y	Z	
1	Establish riparian buffers where absent and/or remove invasives where present	Loss of nutrient and organic inputs, reduced evapotranspiration and bioinfiltration						SIAC, CCSBP		SIAC, CCSBP				CCSBP, CNWR-CCP	
2	Concentrate and better manage recreation and public access to intact riparian, wetland, and shrub-steppe habitats	Habitat loss - riparian and wetland						CBWAMP		CCSBP	CBWAMP	CBWAMP, CCSBP	CBWAMP		CBWAMP, CNWR-CCP
3	Incorporate aquatic habitat complexity and vegetation with future development along with soft bank stabilization techniques	Habitat loss along shoreline								SIAC				SIAC	
		Increased wave energy due to shoreline armoring													
4	Implement stormwater controls consistent with Eastern WA Stormwater manual	Fertilizer/Pesticide/Herbicide inputs							SIAC		SIAC			SIAC	
		Temperature increases												SIAC	
		Bioaccumulation of toxins												SIAC	
5	Restore shrub-steppe along shorelines	Habitat loss - shrub-steppe						SIAC			SIAC		SIAC		
6	Protect intact shrub-steppe habitat	(none)						CBWAMP		SIAC, CBWAMP	SIAC, CBWAMP	CBWAMP	SIAC	SIAC, CBWAMP	
7	Protect steep slope areas from runoff and sedimentation	Sediment cycle disruption							SIAC						
8	Monitor shoreline periodically and evaluate protection measures if grazing impacts appear	NA													
9	Protect existing wetland and riparian habitats	NA						SIAC, CBWAMP			CBWAMP	CBWAMP	CCSBP	SIAC, CBWAMP, CCSBP, CNWR-CCP	
10	Grass or woody plant strips between agricultural fields and either lakes or streams	Habitat loss								SIAC	SIAC	SIAC	SIAC	SIAC	
11	Concentrate livestock water access, including exclusion fencing if feasible	NA							SIAC			SIAC	SIAC	SIAC	

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			O	P	Q	R	S	T	U	V	W	X	Y	Z
12 Manage nutrient and temperature loading at nearby hatchery	Effluent inputs - nutrient sources and elevated temperature water	Decrease nutrient sources												
	Temperature increases	Improved temperature/dissolved oxygen and protect against elevated toxin/pathogen conditions												
		Aquatic species - rearing/migration												
13 Evaluate opportunities for existing hardened shoreline/ armoring removal and native vegetation replanting with soft shoreline stabilization.	Habitat loss	Terrestrial and aquatic species - foraging/feeding/nesting/migration/rearing												
	Increased wave energy due to shoreline armoring	Decrease soil erosion												
	Sediment cycle disruption	Riparian vegetation recruitment												
14 Substrate enhancement	Sediment cycle disruption due to periodic flooding and ice dams	Decrease sedimentation/excessive deposition												
15 Reconnect floodplain and/or wetland connectivity where appropriate	Habitat fragmentation	Increased water storage												
	Reduced water storage, and reduced filtration of sediment, nutrient-, toxin-, or pathogen-laden water	Increased subsurface infiltration and flow, protect surface water quality									CCSBP			
	Habitat loss	Increased hyporheic exchange and groundwater recharge												
	Sediment and organic material cycle disruption	Terrestrial and aquatic species - foraging/feeding/nesting/migration/rearing												

Notes:
 BLRMP - Banks Lake Resource Management Plan
 CBWAMP - Columbia Basin Wildlife Area Management Plan
 CCSBP - Crab Creek Subbasin Plan
 GCPUD - Grant County PUD Article 418 of Priest Rapids Project License
 HR-CCP - Hanford Reach National Monument Comprehensive Conservation Plan and Environmental Impact Statement
 SIAC - Shoreline Inventory, Analysis, and Characterization Report (Anchor QEA)
 * Impairment and benefits general categories come from Table 1 of this Restoration Plan

Grant County areas
Cities and Towns

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Restoration / Protection Opportunities		Key Impairments*	Key Benefits to Ecological Functions*	Rocky Ford Creek	Upper Crab Creek	Town of Krupp (Upper Crab Creek)	Town of Wilson Creek (Upper Crab Creek)
				AA	BB	CC	DD
1	Establish riparian buffers where absent and/or remove invasives where present	Loss of nutrient and organic inputs, reduced evapotranspiration and bioinfiltration	Riparian vegetation recruitment Increased habitat for aquatic and terrestrial species foraging/feeding/nesting/migration	SIAC, CCSBP	SIAC, CCSBP	SIAC, CCSBP	CCSBP
2	Concentrate and better manage recreation and public access to intact riparian, wetland, and shrub-steppe habitats	Habitat loss - riparian and wetland	Riparian vegetation recruitment for native terrestrial species foraging/feeding/nesting habitat Temperature/dissolved oxygen improvements Improve toxin/pathogen management capabilities				
3	Incorporate aquatic habitat complexity and vegetation with future development along with soft bank stabilization techniques	Habitat loss along shoreline Increased wave energy due to shoreline armoring	Maintained or increased habitat for aquatic species – rearing/migration Reduced soil erosion				
4	Implement stormwater controls consistent with Eastern WA Stormwater manual	Fertilizer/Pesticide/Herbicide inputs Temperature increases Bioaccumulation of toxins	Reduced excess nutrient sources to improve water quality Temperature/dissolved oxygen improvements Toxin/pathogen reduction		SIAC	SIAC	SIAC
5	Restore shrub-steppe along shorelines	Habitat loss - shrub-steppe	Increased native shrub-steppe habitat for terrestrial species foraging/feeding/nesting/migration	SIAC	SIAC	SIAC	
6	Protect intact shrub-steppe habitat	(none)	Increase native shrub-steppe habitat for terrestrial species foraging/feeding/nesting/migration				
7	Protect steep slope areas from runoff and sedimentation	Sediment cycle disruption	Increased subsurface infiltration and flow, protect surface water quality Reductions in soil erosion				
8	Monitor shoreline periodically and evaluate protection measures if grazing impacts appear	NA	Reductions in soil erosion Riparian vegetation recruitment Protections for temperature/dissolved oxygen conditions and protection against toxin/pathogen addition		SIAC		
9	Protect existing wetland and riparian habitats	NA	Protections for temperature/dissolved oxygen conditions and protection against toxin/pathogen addition Protection for aquatic and terrestrial species - foraging/feeding/nesting/rearing	CCSBP	CCSBP	CCSBP	CCSBP
10	Grass or woody plant strips between agricultural fields and either lakes or streams	Habitat loss	Soil erosion protection Support native grassland and shrub steppe features Increase habitat for terrestrial species - foraging/feeding/nesting/migration		SIAC		
11	Concentrate livestock water access, including exclusion fencing if feasible	NA	Reductions in soil erosion Riparian vegetation recruitment Protections for temperature/dissolved oxygen conditions and protection against toxin/pathogen addition	SIAC	CCSBP	SIAC	

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12	Manage nutrient and temperature loading at nearby hatchery	Effluent inputs - nutrient sources and elevated temperature water	Decrease nutrient sources	SIAC			
		Temperature increases	Improved temperature/dissolved oxygen and protect against elevated toxin/pathogen conditions				
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		Sediment cycle disruption	Riparian vegetation recruitment				
14	Substrate enhancement	Sediment cycle disruption due to periodic flooding and ice dams	Decrease sedimentation/excessive deposition				SIAC
15	Reconnect floodplain and/or wetland connectivity where appropriate	Habitat fragmentation	Increased water storage				
		Reduced water storage, and reduced filtration of sediment, nutrient-, toxin-, or pathogen-laden water	Increased subsurface infiltration and flow, protect surface water quality				
		Habitat loss	Increased hyporheic exchange and groundwater recharge				
		Sediment and organic material cycle disruption	Terrestrial and aquatic species - foraging/feeding/nesting/migration/rearing				