8. Appendices

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Appendix A – Species Phenology

Amphibians and Reptiles

Coastal Tailed Frog (*Ascaphus truei)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Spawning					X	X	X	X	X	X		
Incubation (egg)					X	X	X	X	X			
Tadpole	X	X	X	X	X	X	X	X	X	X	X	X
Adult General Activity	X	X	X	X	X	X	X	X	X	X	X	X
Adult Migration												
OverWintering												

Columbia spotted frog (*Rana luteiventris)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Spawning		X	X	X	X	X						
Incubation (egg)		X	X	X	X	X	X					
Tadpole		X	X	X	X	X	X	X				
Adult General Activity		X	X	X	X	X	X	X	X	X	X	
Adult Migration	X	X	X	X	X	X	X					
OverWintering	X	X	X								X	X

Northern Leopard Frog *(Rana pipiens)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Spawning			X	X	X	X	X					
Incubation (egg)			X	X	X	X	X	X				
Tadpole						X	X	X	X			
Adult General Activity			X	X	X	X	X	X	X	X		
Adult Migration			X	X	X	X					X	X
OverWintering	X	X										

Oregon Spotted Frog (*Rana pretiosa)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Spawning		X	X	X	X	X						
Incubation (egg)		X	X	X	X	X	X					
Tadpole			X	X	X	X	X	X				
Adult General Activity		X	X	X	X	X	X	X	X			
Adult Migration						X	X		X	X		
OverWintering	X	X								X	X	X

Western Toad (*Bufo boreas)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Spawning		X	X	X	X	X	X					
Incubation (egg)		X	X	X	X	X	X	X				
Tadpole		X	X	X	X	X	X	X	X			
Adult General Activity	X	X	X	X	X	X	X	X	X	X	X	
Adult Migration	X	X	X	X	X	X	X	X				
OverWintering	X	X	X	X							X	X

Western Pond Turtle (*Clemmys marmorata)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Nesting					X	X	X	X				
Foraging		X	X	X	X	X	X	X	X	X		
OverWintering	X										X	X

Birds

Bald Eagle *(Haliaeetus leucocephalus)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Migration	X	X				X	X	X	X	X	X	
Nesting	X	X	X	X	X	X	X	X				
Wintering	X	X								X	X	X

Black Tern *(Chlidonias niger)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Migration				X	X			X	X	X		
Nesting						X	X					
Wintering	X	X	X	X						X	X	X

Brown Pelican *(Pelecanus occidentalis californicus)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Migration			X	X	X	X	X	X		X	X	X
Resident, Non-breeding				X	X	X	X	X	X	X	X	X
Wintering												

Common Loon (Gavia immer)

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Migration				X	X				X	X	X	
Nesting					X	X	X	X	X	X		
Resident, Non-breeding			X	X							X	
Wintering	X	X	X									X

Common Murre *(Uria aalge)*

Life Stage	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**
Nesting					X	X	X	X				
Resident, Non-breeding			X	X				X	X	X		
Wintering	X	X									X	X

Eared Grebe *(Podiceps nigricollis)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Migration	X		X	X				X	X	X	X	X
Nesting					X	X	X	X				
Resident, Non-breeding			X	X					X	X	X	
Wintering	X	X										X

Harlequin Duck *(Histrionicus histrionicus)*

Life Stage	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**
Migration				X	X	X	X	X	X			
Nesting				X	X	X	X	X				
Resident, Non-breeding			X	X					X	X	X	
Wintering	X	X										X

Marbled Murrelet *(Branchyramphus marmoratus)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Nesting				X	X	X	X	X				
Resident, Non-breeding			X	X					X	X	X	
Wintering	X	X										X

Tufted Puffin *(Fratercula cirrhata)*

Life Stage	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**
Nesting				X	X	X	X	X				
Wintering	X	X	X	X					X	X	X	X

Western Snowy Plover *(Charadrius alexandrinus nivosus)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Migration		X	X	X			X	X	X	X		
Nesting			X	X	X	X	X	X				
Wintering	X	X							X	X	X	X

Fish

Brown Rockfish *(Sebastes auriculatus)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Adult	X	X	X	X	X	X	X	X	X	X	X	X
Parturition					X	X	X					
Larvae					X	X	X	X				
Juvenile	X	X	X	X	X	X	X	X	X	X	X	X

Bull Trout *(Salvelinus confluentus)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Adult Migration						X	X					
Spawning								X	X	X	X	X
Incubation/emergence	X	X	X	X	X			X	X	X	X	X
Freshwater Rearing	X	X	X	X	X	X	X	X	X	X	X	X
OutMigration				X	X	X						
Nearshore Rearing	X	X	X	X	X	X	X	X				X
Offshore Rearing	X	X	X	X	X	X	X	X				X

Chinook salmon *(Oncorhynchus tshawytscha)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Adult Migration		X	X	X	X	X	X	X	X	X	X	X
Spawning							X	X	X	X	X	
Incubation/Emergence	X	X						X	X	X	X	X
Freshwater rearing	X	X	X	X	X	X	X	X	X	X	X	X
OutMigration	X	X	X	X	X	X						
Nearshore Rearing	X	X	X	X	X	X	X	X	X	X	X	X
Offshore Rearing	X	X	X	X	X	X	X	X	X	X	X	X

Chum Salmon *(Oncorhynchus keta)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Adult Migration					X	X	X	X	X	X	X	X
Spawning									X	X	X	X
Incubation/emergence	X	X	X	X					X	X	X	X
Freshwater Rearing	X	X	X	X	X	X						
OutMigration	X	X	X	X	X	X						
Nearshore Rearing	X	X	X	X	X	X	X	X	X	X	X	X
Offshore Rearing	X	X	X	X	X	X	X	X	X	X	X	X

Coastal Cutthroat Trout *(Oncorhynchus clarki clarki)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Adult Migration	X	X					X	X	X	X	X	X
Spawning	X	X	X	X	X							X
Incubation/emergence		X	X	X	X	X						

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Freshwater Rearing	X	X	X	X	X	X	X	X	X	X	X	X
OutMigration				X	X	X	X	X	X			
Nearshore Rearing	X						X	X	X	X	X	X
Offshore Rearing	X	X	X	X	X	X	X	X	X	X	X	X

Coho *(Oncorhynchus kisutch)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Adult Migration	X								X	X	X	X
Spawning	X									X	X	X
Incubation / Emergence	X	X	X								X	X
Freshwater rearing	X	X	X	X	X	X	X	X	X	X	X	X
OutMigration			X	X	X	X	X	X	X			
Nearshore Rearing	X	X	X	X	X	X	X	X	X	X	X	X
Offshore Rearing	X	X	X	X	X	X	X	X	X	X	X	X

Copper Rockfish *(Sebastes caurinus)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Adult	X	X	X	X	X	X	X	X	X	X	X	X
Parturition				X	X	X						
Larvae	X	X	X	X	X	X	X	X	X	X	X	X
Juvenile	X	X	X	X	X	X	X	X	X	X	X	X

Olympic Mudminnow *(Novumbra hubbsi)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Adult	X	X	X	X	X	X	X	X	X	X	X	X
Spawning	X	X	X	X	X	X					X	X
Juvenile	X	X	X	X	X	X						X

Pacific Cod *(Gadus macrocephalus)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Spawning	X	X	X	X	X							
Incubation (egg)	X	X	X	X	X	X						
Larvae	X	X	X	X	X	X	X	X				
Juvenile	X	X	X	X	X	X	X	X	X	X	X	X

Pacific Hake *(Merluccius productus)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Spawning		X	X	X								
Incubation (egg)		X	X	X	X							
Larvae			X	X	X	X	X	X				
Juvenile	X	X	X	X	X	X	X	X	X	X	X	X

Pacific Herring *(Clupea pallasii)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Adult - Puget Sound	X	X	X	X	X	X	X	X	X	X	X	X
Adult - Cherry Point			X	X	X	X						
Egg- Puget Sound	X	X	X	X								
Egg - Cherry Point				X	X	X						

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Larvae - Puget Sound	X	X	X	X								
Larvae - Cherry Point				X	X	X						
Juvenile - Puget Sound	X	X	X	X	X	X	X	X	X	X	X	X
Juvenile - Cherry Point					X	X	X	X				

Pink salmon *(Oncorhynchus gorbuscha)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Adult Migration						X	X	X	X	X		
Spawning						X	X	X	X	X	X	
Incubation/Emergence	X	X	X	X							X	X
Freshwater rearing												
OutMigration	X	X	X	X	X							
Nearshore Rearing	X	X	X	X	X	X	X					
Offshore Rearing	X	X	X	X	X	X	X	X	X	X	X	X

Pygmy Whitefish *(Prosopium coulteri)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Adult	X	X	X	X	X	X	X	X	X	X	X	X
Spawning	X								X	X	X	X
Incubation (egg)*	X								X	X	X	X
Juvenile	X	X	X	X	X	X	X	X	X	X	X	X

Quillback Rockfish *(Sebastes maliger)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Adult	X	X	X	X	X	X	X	X	X	X	X	X
Parturition					X							
Larvae					X	X	X					
Juvenile	X	X	X	X	X	X	X	X	X	X	X	X

Sockeye salmon *(Oncorhynchus nerka)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Adult Migration-Anadromous	X	X					X	X	X	X	X	X
Spawning-Anadromous	X							X	X	X	X	X
Incubation/Emergence-Anadromous	X	X	X					X	X	X	X	X
Freshwater rearing-Anadromous	X	X	X	X	X	X	X	X	X	X	X	X
OutMigration-Anadromous				X	X	X	X					
Nearshore Rearing-Anadromous	X	X	X	X	X	X	X	X	X	X	X	X
Offshore Rearing	X	X	X	X	X	X	X	X	X	X	X	X
Adult-Kokanee	X	X	X	X	X	X	X	X	X	X	X	X
Spawning-Kokanee	X								X	X	X	
Incubation/Emergence-Kokanee	X	X							X	X	X	X

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Freshwater rearing-Kokanee	X	X	X	X	X	X	X	X	X	X	X	X

Steelhead trout *(Oncorhynchus mykiss)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Adult Migration	X	X	X	X	X	X	X	X	X	X	X	X
Spawning	X	X	X									X
Incubation	X	X	X	X	X							
Freshwater rearing	X	X	X	X	X	X	X	X	X	X	X	X
OutMigration			X	X	X	X	X	X				
Nearshore Rearing	X	X	X	X	X	X	X	X	X	X	X	X
Offshore Rearing	X	X	X	X	X	X	X	X	X	X	X	X

Walleye Pollock *(Theragra chalcogramma)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Spawning		X	X	X								
Incubation (egg)		X	X	X								
Larvae			X	X	X	X	X					
Juvenile	X	X	X	X	X	X	X	X	X	X	X	X

White Sturgeon *(Acipenser transmontanus)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Adult	X	X	X	X	X	X	X	X	X	X	X	X
Spawning				X	X	X	X					
Egg/Larvae				X	X	X	X	X				
Juvenile	X	X	X	X	X	X	X	X	X	X	X	X

Invertebrates

Olympia Oyster *(Ostrea conchaphila)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Adult	X	X	X	X	X	X	X	X	X	X	X	X
Spawning							X	X				
Larvae							X	X				
Juvenile	X	X	X	X	X	X	X	X	X	X	X	X

Pinto Abalone *(Haliotis kamtschatkana)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Adult	X	X	X	X	X	X	X	X	X	X	X	X
Spawning				X	X	X	X	X				
Larvae				X	X	X	X	X				
Juvenile	X	X	X	X	X	X	X	X	X	X	X	X

Marine Mammals

Humpback Whale *(Megaptera novaeangliae)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
All				X	X	X	X	X	X	X		

Killer Whale *(Orcinus orca)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Offshore	X	X	X	X	X	X	X	X	X	X	X	X
Resident	X	X	X	X	X	X	X	X	X	X	X	X
Resident--Calves	X	X	X							X	X	X
Transient	X	X	X	X	X	X	X	X	X	X	X	X

Sea Otter *(Enhydra lutris kenyoni)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Adult and Pup	X	X	X	X	X	X	X	X	X	X	X	X

Plants

Persisterntsepal Yellewcress *(Rorippa columbiae)*

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Dormancy	X	X	X								X	X
Growth			X	X	X	X				X		
Flowering							X	X	X			

Water Howellia (*Howellia aquatilis*)

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Germination									X	X	X	
Growth	X	X	X	X	X						X	X
Flowering					X	X	X	X				
Scenescence									X			

Water Lobelia (*Lobelia dortmanna*)

Life Stage	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Dormancy	X	X	X						X	X	X	X
Growth			X	X	X				X			
Flowering						X	X	X				

Appendix B – Species Habitat Occurrence

Species	Life Stage	Saltwater									Freshwater													
		Coastal				Inland					Riverine					Lacustrine								
		Nearshore		Offshore		Nearshore		Offshore								Oligotropic		Meostropic		Eutrophic		Unknown		
		Unconsolidated	Consolidated	Unconsolidated	Consolidated	Unconsolidated	Consolidated	Unconsolidated	Consolidated	Tidal Wetland	Low-Gradient Valley	Pool-Riffle	Plane Bed	Step-Pool	Cascade	Littotal	Limnetic	Littotal	Limnetic	Littotal	Limnetic	Littotal	Limnetic	Freshwater Wetland
Amphibians and Reptiles																								
Cascades Frog (*Rana cascadae*)	Adult										x	x	x	x		x		x		x		x		x
	Egg											x		x		x		x		x		x		x
	Tadpole											x		x		x		x		x		x		x
Coast Tailed Frog (*Ascaphus truei*)	Adult											x	x	x										
	Egg											x	x	x										
	Tadpole											x	x	x	x									
Columbia Spotted Frog (*Rana luteiventris*)	Adult										x	x	x	x		x		x		x		x		x
	Egg										x	x	x	x		x		x		x		x		x
	Tadpole										x	x	x	x		x		x		x		x		x
Northern Leopard Frog (*Rana pipiens*)	Adult										x	x	x	x		x		x		x		x		x
	Egg																							x
	Tadpole																							x
Northern Red-Legged Frog (*Rana aurora aurora*)	Adult										x	x	x	x		x		x		x		x		x
	Egg										x	x	x	x		x		x		x		x		x
	Tadpole										x	x	x	x		x		x		x		x		x
Oregon Spotted Frog (*Rana pretiosa*)	Adult																							x
	Egg																							x
	Tadpole																							x
Rocky Mountain Tailed-Frog (*Ascaphus montanus*)	Adult											x	x	x										
	Egg											x	x	x										
	Tadpole											x	x	x	x									

Species	Life Stage	Saltwater									Freshwater													
		Coastal				Inland					Riverine					Lacustrine								
		Nearshore		Offshore		Nearshore		Offshore								Oligotropic		Meostropic		Eutrophic		Unknown		
		Unconsolidated	Consolidated	Unconsolidated	Consolidated	Unconsolidated	Consolidated	Unconsolidated	Consolidated	Tidal Wetland	Low-Gradient Valley	Pool-Riffle	Plane Bed	Step-Pool	Cascade	Littotal	Limnetic	Littotal	Limnetic	Littotal	Limnetic	Littotal	Limnetic	Freshwater Wetland
Western Toad (*Bufo boreas*)	Adult										x	x	x	x		x		x		x		x		x
	Egg										x	x	x	x		x		x		x		x		x
	Tadpole										x	x	x	x		x		x		x		x		x
Western Pond Turtle (*Clemmys marmorata*)	Foraging										x	x	x	x		x		x		x		x		x
	Nesting (terrestrial)																							
	OverWintering															x		x		x		x		x
Birds																								
Bald Eagle (*Haliaeetus leucicephalus)*	Non-nestinh	x	x			x	x			x	x	x	x	x	x			x	x	x	x	x	x	
	Nesting	x	x			x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Black Tern (*Childonias niger*)	Migration										x					x		x		x		x		x
	Nesting										x					x		x		x		x		x
Brandt's Cormorant (*Phalacrocorax penicillatus)*	Nesting	x	x			x	x			x														
	Non-nesting	x	x			x	x			x														
California Brown Pelican (*Pelecanus occidentalis californicus*)	Migration	x	x	x	x	x	x	x	x	x														
Clark's Grebe *(Aechmorphus clarkii)*	Migration										x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Nesting										x	x	x	x	x	x	x	x	x	x	x	x	x	x

Species	Life Stage	Saltwater									Freshwater													
		Coastal				Inland					Riverine					Lacustrine								
		Nearshore		Offshore		Nearshore		Offshore								Oligotropic		Meostropic		Eutrophic		Unknown		
		Unconsolidated	Consolidated	Unconsolidated	Consolidated	Unconsolidated	Consolidated	Unconsolidated	Consolidated	Tidal Wetland	Low-Gradient Valley	Pool-Riffle	Plane Bed	Step-Pool	Cascade	Littotal	Limnetic	Littotal	Limnetic	Littotal	Limnetic	Littotal	Limnetic	Freshwater Wetland
Common Loon *(Gavia immer)*	Non-nesting	x	x	x	x	x	x	x	x		x					x	x					x	x	x
	Nesting															x	x					x	x	x
Common Murre *(Uria aalge)*	Nesting	x	x	x	x	x	x	x	x															
	Wintering	x	x	x	x	x	x	x	x															
Eared Grebe *(Podiceps nigricollis)*	Nesting																							x
	Wintering	x	x			x	x			x										x	x	x	x	
Harlequin Duck *(Histrionicus histrionicus)*	Nesting									x		x	x	x		x	x	x	x	x	x	x	x	x
	Non-nesting	x	x			x	x			x	x													
Marbled Murrelet *(Branchyramphus marmoratus)*	Nesting	x	x	x	x	x	x	x	x	x						x	x					x	x	
	Non-nesting	x	x	x	x	x	x	x	x	x						x	x					x	x	
Tufted Puffin *(Fratercula cirrhata)*	Nesting			x	x			x	x															
	Wintering (>3mi offshore)			x	x																			
Fish																								
Brown Rockfish *(Sebastes auriculatus)*	Adult					x	x	x	x															
	Benthic Juvenile					x	x																	
	Pelagic Larvae					x	x																	

Species	Life Stage	Saltwater									Freshwater													
		Coastal				Inland					Riverine					Lacustrine								
		Nearshore		Offshore		Nearshore		Offshore								Oligotropic		Meostropic		Eutrophic		Unknown		
		Unconsolidated	Consolidated	Unconsolidated	Consolidated	Unconsolidated	Consolidated	Unconsolidated	Consolidated	Tidal Wetland	Low-Gradient Valley	Pool-Riffle	Plane Bed	Step-Pool	Cascade	Littotal	Limnetic	Littotal	Limnetic	Littotal	Limnetic	Littotal	Limnetic	Freshwater Wetland
Bull Trout *(Salvelinus confluentus)*	Adult	x	x			x	x			x	x	x	x	x		x	x	x	x	x	x	x	x	x
	Juvenile	x	x			x	x			x	x	x	x	x		x	x	x	x	x	x	x	x	x
	Incubation / Emergence											x	x	x										
Chinook Salmon *(Oncorhynchus tshawytscha)*	Adult	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Juvenile	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Incubation / Emergence										x	x	x	x	x									
Chum Salmon *(Oncorhynchus keta)*	Adult	x	x	x	x	x	x	x	x	x	x	x	x	x										x
	Juvenile	x	x			x	x			x	x	x	x											x
	Incubation / Emergence											x	x											
Coastal Cutthroat Trout *(Oncorhynchus clarki clarki)*	Adult	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x
	Juvenile	x	x			x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Incubation / Emergence										x	x	x	x										
Coho Salmon *(Oncorhynchus kisutch)*	Adult	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Incubation / Emergence											x	x	x										
Copper Rockfish *(Sebastes caurinus)*	Adult / Partuition		x		x		x		x															
	Benthic Juvenile	x	x			x	x																	
	Pelagic Larvae	x	x			x	x		x															

Species	Life Stage	Saltwater									Freshwater													
		Coastal				Inland					Riverine					Lacustrine								
		Nearshore		Offshore		Nearshore		Offshore								Oligotropic		Meostropic		Eutrophic		Unknown		
		Unconsolidated	Consolidated	Unconsolidated	Consolidated	Unconsolidated	Consolidated	Unconsolidated	Consolidated	Tidal Wetland	Low-Gradient Valley	Pool-Riffle	Plane Bed	Step-Pool	Cascade	Littotal	Limnetic	Littotal	Limnetic	Littotal	Limnetic	Littotal	Limnetic	Freshwater Wetland
Kokanee *(Oncorhynchus nerka)*	All										x	x	x	x		x	x	x	x	x	x	x	x	x
Olympic Mudminnow *(Novumbra hubbsi)*	All										x	x				x		x		x		x		x
Pacific Cod *(Gadus macrocephalus)*	Adult	x		x				x																
	Benthic Juvenile	x				x																		
	Egg	x		x				x																
	Pelagic Larvae	x	x			x	x																	
Pacific Hake *(Merluccius productus)*	Adult			x	x			x	x															
	Benthic Juvenile	x				x																		
	Pelagic Larvae	x	x	x	x	x	x	x	x															
Pacific Herring *(Clupea pallasii)*	Adult	x	x	x	x	x	x	x	x															
	Egg / Larvae	x	x			x	x																	
	Juvenile	x	x	x	x	x	x	x	x															
Pacific Herring - Cherry Point *(Clupea pallasii)*	Adult					x	x	x	x															
	Egg / Larvae					x	x																	
	Juvenile					x	x																	
Pink Salmon *(Oncorhynchus*	Adult	x	x	x	x	x	x	x	x	x	x	x	x	x										
	Juvenile	x	x	x	x	x	x	x	x	x	x	x	x	x										

Species	Life Stage	Saltwater									Freshwater													
		Coastal				Inland					Riverine					Lacustrine								
		Nearshore		Offshore		Nearshore		Offshore								Oligotropic		Meostropic		Eutrophic		Unknown		
		Unconsolidated	Consolidated	Unconsolidated	Consolidated	Unconsolidated	Consolidated	Unconsolidated	Consolidated	Tidal Wetland	Low-Gradient Valley	Pool-Riffle	Plane Bed	Step-Pool	Cascade	Littotal	Limnetic	Littotal	Limnetic	Littotal	Limnetic	Littotal	Limnetic	Freshwater Wetland
gorbuscha)	Incubation / Emergence										x	x	x	x										
Pygmy Whitefish *(Prosopium coulteri)*	Adult															x	x	x	x			x	x	
	Egg / Incubation											x				x		x				x		
	Juvenile															x	x	x	x			x	x	
Quillback Rockfish (*Sebastes maliger)*	Adult					x	x	x	x															
	Benthic Juvenile					x	x																	
	Pelagic Larvae					x	x																	
River Lamprey *(Lampetra ayresi)*	Adult										x	x	x	x										
	Egg / Ammocoete Larvae										x	x												
	Spawning											x												
Sockeye Salmon *(Oncorhynchus nerka)*	Adult	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x
	Juvenile	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x
	Incubation / Emergence												x			x	x	x	x	x	x	x	x	
Steelhead Trout *(Oncorhynchus mykiss)*	Adult	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Juvenile	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Incubation / Emergence										x	x	x	x	x	x	x	x	x	x	x	x	x	x
Walleye Pollock	Adult					x	x	x	x															

Species	Life Stage	Saltwater									Freshwater													
		Coastal				Inland					Riverine					Lacustrine								
		Nearshore		Offshore		Nearshore		Offshore								Oligotropic		Meostropic		Eutrophic		Unknown		
		Unconsolidated	Consolidated	Unconsolidated	Consolidated	Unconsolidated	Consolidated	Unconsolidated	Consolidated	Tidal Wetland	Low-Gradient Valley	Pool-Riffle	Plane Bed	Step-Pool	Cascade	Littotal	Limnetic	Littotal	Limnetic	Littotal	Limnetic	Littotal	Limnetic	Freshwater Wetland
(Theragra chalcogramma)	Benthic Juvenile					x		x																
	Pelagic Larvae					x	x																	
Western Snowy Plover *(Charadrius alexandrinus nivosus)*	Breeding	x				x				x														
	Wintering	x	x							x														x
Westslope Cutthroat *(Oncorhynchus clarki lewisi)*	All										x	x	x	x	x	x	x	x	x	x	x	x	x	x
White Sturgeon *(Acipenser transmontanus)*	Adult	x	x	x	x	x	x	x	x	x	x	x	x	x				x	x			x	x	
	Egg / Larvae										x	x	x	x										
	Juvenile	x									x	x	x					x	x			x	x	
Invertebrates																								
Olympia Oyster (*Ostrea conchaphila)*	Adult	x	x			x	x																	
	Larvae / Juvenile	x	x			x	x																	
Pinto Abalone *(Haliotis kamschatkana)*	Adult						x																	
	Egg					x	x																	
	Juvenile						x																	
Marine Mammals																								

Species	Life Stage	Saltwater									Freshwater													
		Coastal				Inland					Riverine					Lacustrine								
		Nearshore		Offshore		Nearshore		Offshore								Oligotropic		Meostropic		Eutrophic		Unknown		
		Unconsolidated	Consolidated	Unconsolidated	Consolidated	Unconsolidated	Consolidated	Unconsolidated	Consolidated	Tidal Wetland	Low-Gradient Valley	Pool-Riffle	Plane Bed	Step-Pool	Cascade	Littotal	Limnetic	Littotal	Limnetic	Littotal	Limnetic	Littotal	Limnetic	Freshwater Wetland
Humpback Whale *(Megaptera novaeamgliae)*	All																							
Killer Whale *(Orcinus orca)*	Offshore - All																							
	Resident - All	x	x	x	x	x	x	x	x															
	Transient	x	x	x	x	x	x	x	x															
Northern Sea Otter *(Enhydra lutris kenyoni)*	All	x	x			x	x																	
Steller Sea Lion *(Eumetopias jubatus)*	Adult nonbreeding	x	x	x	x	x	x	x	x	x														
Plants																								
Persistentsepal Yellowcress *(Rorippa columbiae)*	All										x	x	x	x	x									
Pygmy Water Lily (*Nymphaea teragona)*	All										x					x		x		x		x		
Water Howellia (*Howellia aquatilis)*	All																							x
Water Lobelia (*Lobelia dortmanna)*	All															x						x		

Appendix C – Ecosystem Characteristics

Ecosystem	Region/ Class	Habitat	Characteristics
Saltwater - Offshore			▪ Depth greater than 20 meters ▪ Benthic habitat below the photic zone ▪ Energy production derived from water column phytoplankton communities ▪ Dominated by unconsolidated sediments
	Coastal		▪ Unconsolidated habitats dominate, with consolidated habitats concentrated off the Olympic coast, west and southwest of Willapa Bay, and off Cape Flattery
	Inland		▪ Unconsolidated habitats dominate, with consolidated habitats concentrated off the San Juan Islands, the west coast of Whidbey Island and Admiralty Inlet, and the Tacoma Narrows
		Consolidated	▪ Substrate - rocks larger than cobble (265 millimeters in diameter), bedrock and consolidated clays ▪ Biota - high to moderate energy regimes: encrusting invertebrates and plants, urchins, rockfish, gobies, lingcod and sculpins; low energy - glass sponges, serpulid polychaetes, planktivorous invertebrates, cup coral, rockfish, longfin sculpin and gobies
		Unconsolidated	▪ Substrate - cobble, gravel, sand, mud and organic materials ▪ Biota ▪ High energy (cobble and mixed-coarse substrates) - mussels, barnacles, urchins, rock scallops, small bivalves, amphipods, and polychaetes ▪ Low energy (mud) - sea pens and whips, polychaetes, bivalves, amphipods, anemones, sea stars, urchins and sea cucumbers
		Water Column	▪ Greater than 10 meters above the bottom ▪ Biota - plankton (eggs, larvae, phytoplankton, zooplankton), fish (herring, salmonids, smelt, lamprey, spiny dogfish, cods, sandlance, rockfish), birds and marine mammals
		Deep	▪ Depth greater than 200 meters

Ecosystem	Region/ Class	Habitat	Characteristics
Saltwater - Nearshore			▪ Depth less than 20 meters ▪ Energy primarily derived from benthic vegetation and terrestrial sources ▪ Benthic habitats within the photic zone ▪ Vegetation has significant influence on species assemblages
	Coastal		▪ Unconsolidated habitat dominates, with consolidated substrates found in scattered along the northern coast and rocky headlands in estuaries
	Inland		▪ Unconsolidated habitat dominates, with consolidated habitat most common among the San Juan Islands, and on rocky headlands in Puget Sound
		Consolidated	▪ Intertidal and shallow subtidal areas dominated by bedrock or boulder ▪ Biota - Macroscopic red, green and brown algae; Kelp beds used by sea otters, and a variety of fish and invertebrate species for rearing, feeding and refuge; benthic diatoms
		Unconsolidated	▪ Eelgrass meadows (approximately +0.3 meters to –10 meters mllw) used by a variety of fish and invertebrates for rearing, feeding and refuge ▪ Flat areas of fine to coarse unconsolidated sediments near river and stream deltas and embayments not associated with freshwater systems; drift seaweeds; infauna (worms, small crustaceans and bivalves); shorebirds; abundant juvenile and adult fish; recreationally and commercially important stocks of clams ▪ Sub-estuaries characterized by variable salinity concentrations; riparian habitat, dune habitat, tidal marshes, seaweed assemblages, eelgrass meadows, and limited rocky shore habitat. ▪ Riparian Zone vegetated with overhanging shrubs and trees
		Water Column	▪ Greater than 10 meters above the bottom ▪ Biota - plankton (eggs, larvae, phytoplankton, zooplankton), fish (herring, salmonids, smelt, spiny dogfish, sandlance, rockfish), birds and marine mammals

Ecosystem	Region/ Class	Habitat	Characteristics
Tidal Wetlands			▪ Depth - mean high water to extreme higher high water ▪ Periodically inundated with tidal waters ▪ Emergent vegetation dominated by angiosperms ▪ Soft sediments, with anoxic subsurface conditions ▪ Protected from wave energies ▪ Significant localized freshwater input
Freshwater - Riverine			▪ Long linear interconnected networks, comprised of patterns and processes in that occur in longitudinal, lateral, and vertical dimensions ▪ Uni-directional flows terminating at the confluence with a larger stream or river, marine ecosystems or a lake ▪ Gradient typically decreases with longitudinal distance downstream ▪ Structure and variability of in channel habitat determined by topography ▪ Energy sources, community composition and behavioral adaptations vary with increasing distance downstream ▪ Includes riverine wetlands
		Low-gradient valley	▪ Slopes less than 0.1 percent with sand and gravel substrates ▪ Channels commonly have multiple threads ▪ Sediment supply generally greater than the river's transport capacity.
		Riffle-pool	▪ Alternating sequences of pools, bars, and riffles with gradients of 0.1 to 2 percent ▪ Sinuous with a high reach to valley length ratio ▪ Pools typically created by scour, with deposition occurring between pools in riffles or adjacent to pools on bars ▪ Particle sizes comprised of gravel and/or cobble

Ecosystem	Region/ Class	Habitat	Characteristics
		Plane bed	▪ Gradients between 2 and 4 percent ▪ Composed of intermediate substrate sizes (gravel to cobble)
		Step-pool	▪ Gradients between 4 and 8 percent ▪ Alternating sequences of relatively deep stream sections with flat, non-turbulent flow and shallow, steep sections with turbulent flow ▪ Pools formed by large boulders that restrict the flow of water, resulting in a backwater upstream of the restriction and a substantial drop in elevation downstream of the restriction
		Cascade	▪ Gradients greater than 8 percent ▪ Beds comprised of large boulders with channels typically confined by valley walls ▪ Movement of bed material is rare due to the large size of the dominant substrate and relatively shallow water depths
Freshwater - Lakes			▪ Standing body of water located in a topographic depression that is not directly connected to the sea ▪ Distinguished by relatively still waters, no ocean derived salts, and an absence of perennial emergent vegetation ▪ Includes lacustrine wetlands
	Oligotrophic		▪ Primary productivity rates low ▪ Trophic State Index less than 40
	Mesotrophic		▪ Moderate rates of primary productivity ▪ Trophic State Index 40 to 50
	Eutrophic		▪ High rate of primary production ▪ Trophic State Index greater than 50
		Littoral	▪ Ordinary high water waterward to a depth of 2 meters below low water or the extent of annual emergent vegetation

Ecosystem	Region/ Class	Habitat	Characteristics
		Limnetic	▪ Permanently wetted lands deeper than 2 meters, with little to no attached vegetation
		Profundal	▪ Deep water benthic habitat with no vegetation
Freshwater Wetlands (palustrine)			▪ Hydrophytic communities; undrained hydric soils; and non-soil substrates saturated with, or covered by, water at some point in the growing season ▪ Located in terrestrial areas adjacent to lakes and rivers (palustrine) ▪ Vegetation types may be forest, scrub-shrub, and emergent ▪ Emergent vegetation with ocean derived salinities of less than 0.5 practical salinity units (psu); **or** ▪ Lacking emergent vegetation and less than 8 hectares (20 acres), with no active wave formed or bedrock shorelines, and water depths of less than 2 meters

Appendix D – Activity Habitat Matrix

Activity		Saltwater[1]									Freshwater[1]												
		Coastal				Inland					Riverine				Lacustrine								
		Nearshore		Offshore		Nearshore		Offshore							Limnetic				Littoral				
Group	**Sub-group**	**Consolidated**	**Unconsolidated**	**Consolidated**	**Unconsolidated**	**Consolidated**	**Unconsolidated**	**Consolidated**	**Unconsolidated**	**Tidal Wetland**	**Low-gradient valley**	**Plane bed**	**Pool-riffle**	**Step-pool**	**Eutrophic**	**Mesotrophic**	**Oligotrophic**	**Unspecified**	**Eutrophic**	**Mesotrophic**	**Oligotrophic**	**Unspecified**	**Freshwater Wetland**
Aquaculture	Finfish					X	X				X		X				X				X		
	Shellfish	X	X			X	X																
Log Booming and Storage			X			X	X	X	X		X				X	X	X	X	X	X	X	X	
Overwater Structures	Boat Ramp/Launch/Hoist	X	X			X	X				X		X						X	X	X	X	X
	Docks and Wharves	X	X			X	X				X		X		X	X	X	X	X	X	X	X	X
	Floating Homes		X				X				X				X			X	X			X	
	Floats and Rafts	X	X			X	X	X	X		X				X			X	X			X	
	Mooring Buoys					X	X	X	X		X				X	X	X	X	X	X	X	X	
	Nearshore Buildings	X	X			X	X			X	X		X						X	X	X	X	X
	Marinas	X	X			X	X				X		X		X	X	X	X	X	X	X	X	
	Shipyards & Terminal		X			X	X				X				X	X		X	X	X		X	

[1] Note: Data is derived from intersection of the activities table in the RTA Database & GIS habitat dataset at the Township Range level.

Activity		Saltwater[1]									Freshwater[1]												
		Coastal				Inland					Riverine				Lacustrine								
		Nearshore		Offshore		Nearshore		Offshore							Limnetic				Littoral				
Group	**Sub-group**	**Consolidated**	**Unconsolidated**	**Consolidated**	**Unconsolidated**	**Consolidated**	**Unconsolidated**	**Consolidated**	**Unconsolidated**	**Tidal Wetland**	**Low-gradient valley**	**Plane bed**	**Pool-riffle**	**Step-pool**	**Eutrophic**	**Mesotrophic**	**Oligotrophic**	**Unspecified**	**Eutrophic**	**Mesotrophic**	**Oligotrophic**	**Unspecified**	**Freshwater Wetland**
Flood / Erosion Control	Breakwater		X			X	X											X				X	
	Dike/Dam		X				X			X	X		X		X	X		X	X	X		X	X
	Fill and Bank Armoring	X	X			X	X			X	X	X	X		X	X	X	X	X	X	X	X	X
Misc. Nearshore	Public Access	X	X			X	X	X	X	X	X	X	X						X	X	X	X	X
	Sediment Removal		X		X		X			X	X		X		X	X		X	X	X		X	X
Mitigation /Enhancement	Artificial Habitat	X	X			X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X
	Conservation	X	X			X	X	X	X	X	X	X	X		X	X		X	X	X		X	X
	Contamination and Remediation					X	X	X	X	X	X		X						X			X	X
Outfalls	Combined Sewer Overflow					X	X	X	X		X		X			X		X		X		X	X
	Desalinization					X	X	X	X														
	Industrial and Municipal	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
	Stormwater		X			X	X	X	X	X	X		X			X		X		X		X	X

Activity		Saltwater[1]									Freshwater[1]												
		Coastal				Inland					Riverine				Lacustrine								
		Nearshore		Offshore		Nearshore		Offshore							Limnetic				Littoral				
Group	**Sub-group**	**Consolidated**	**Unconsolidated**	**Consolidated**	**Unconsolidated**	**Consolidated**	**Unconsolidated**	**Consolidated**	**Unconsolidated**	**Tidal Wetland**	**Low-gradient valley**	**Plane bed**	**Pool-riffle**	**Step-pool**	**Eutrophic**	**Mesotrophic**	**Oligotrophic**	**Unspecified**	**Eutrophic**	**Mesotrophic**	**Oligotrophic**	**Unspecified**	**Freshwater Wetland**
Transportation	Bridges	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Ferries					X	X	X	X	X						X	X	X		X	X	X	X
	Railroads		X			X	X	X	X	X	X		X			X		X		X		X	X
	Roads	X	X			X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X
Utilities	Cables	X	X			X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X
	Oil/Gas Pipelines					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Sewage Pipelines					X	X			X	X		X		X	X		X	X	X		X	X
	Water Intakes					X	X			X	X		X			X	X	X		X	X	X	X
	Water Pipeline					X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X

Appendix E – Species Activity Nexus

		Aqua-culture		Overwater Structures									Outfalls				Utilities					Transportation				Flood / Erosion Control			Mitigation / Enhancement			Misc.			
Species	LifeStage	Finfish	Shellfish	Log Booming and Storage	Docks and Wharves	Boat Ramp/Launch/Hoist	Nearshore Buildings	Mooring Buoys	Floats and Rafts	Floating Homes	Marinas	Shipyards & Terminal	Stormwater	Industrial and Municipal	Combined Sewer Overflow	Desalinization	Cables	Water Pipeline	Sewage Pipelines	Oil/Gas Pipelines	Water Intakes	Roads	Railroads	Bridges	Ferries	Fill and Bank Armoring	Dike/Dam	Breakwater	Conservation	Contamination and Remediation	Artificial Habitat	Sediment Removal	Public Access	Nexus Count	Species/Activity Overlap Rank[1]
Coast Tailed Frog	Adult	X			X	X	X				X		X	X	X		X	X	X	X	X	X	X	X		X	X		X		X	X	X	6	1
	Tadpole	X			X	X	X				X		X	X	X		X	X	X	X	X	X	X	X		X	X		X		X	X	X	6	1
	Egg	X			X	X	X				X		X	X	X		X	X	X	X	X	X	X	X		X	X		X		X	X	X	6	1
Columbia Spotted Frog	Adult	X		X	X	X	X	X			X	X	X	X			X	X		X	X	X	X	X	X	X	X				X	X	X	7	2
	Tadpole	X		X	X	X	X	X			X	X	X	X			X	X		X	X	X	X	X	X	X	X				X	X	X	7	2
	Egg	X		X	X	X	X	X			X	X	X	X			X	X		X	X	X	X	X	X	X	X				X	X	X	7	2
Northern Leopard Frog	Adult				X	X					X	X		X			X	X		X	X	X		X			X				X	X	X	5	1
	Tadpole																																	0	1
	Egg																																	0	1
Oregon Spotted Frog	Adult																																	0	1
	Tadpole																																	0	1
	Egg																																	0	1
Western Toad	Adult	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	2
	Tadpole	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	2
	Egg	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	2
Western Pond Turtle	Foraging			X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	8	2
	OverWintering			X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	8	2
Bald Eagle	Non-nesting	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
	Nesting	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
Black Tern	Migration			X	X	X	X	X			X	X		X			X	X	X	X	X	X	X	X	X	X	X				X	X	X	6	1
	Nesting			X	X	X	X	X			X	X		X			X	X	X	X	X	X	X	X	X	X	X				X	X	X	6	1
California Brown Pelican	Migration	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
Common Loon	Non-nesting	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
	Nesting	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	2

[1] Species/Activity Overlap Rank: 1 = Nexus count from 0 – 22, 2 = Nexus count from 23 – 30, 3 = Nexus count from 31 - 34

		Aqua-culture		Overwater Structures									Outfalls				Utilities					Transportation				Flood / Erosion Control			Mitigation / Enhancement			Misc.			
Species	LifeStage	Finfish	Shellfish	Log Booming and Storage	Docks and Wharves	Boat Ramp/Launch/Hoist	Nearshore Buildings	Mooring Buoys	Floats and Rafts	Floating Homes	Marinas	Shipyards & Terminal	Stormwater	Industrial and Municipal	Combined Sewer Overflow	Desalinization	Cables	Water Pipeline	Sewage Pipelines	Oil/Gas Pipelines	Water Intakes	Roads	Railroads	Bridges	Ferries	Fill and Bank Armoring	Dike/Dam	Breakwater	Conservation	Contamination and Remediation	Artificial Habitat	Sediment Removal	Public Access	Nexus Count	Species/Activity Overlap Rank[1]
Common Murre	Wintering	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
	Nesting	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
Eared Grebe	Nesting																																	0	1
	Wintering	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
Harlequin Duck	Non-nesting	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
	Nesting						X				X		X	X			X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	6	1
Marbled Murrelet	Non-nesting	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
	Nesting	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
Tufted Puffin	Nesting			X				X	X				X	X	X	X	X			X		X	X	X	X				X	X	X		X	5	1
	Wintering													X																				0	1
Western Snowy Plover	Wintering		X		X		X					X		X			X					X		X					X		X			3	1
	Nesting		X		X		X					X		X			X					X		X					X		X			3	1
Brown Rockfish	Adult	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	9	3
	Juvenile	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	9	3
	Larvae	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	9	3
Bull Trout	Adult	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
	Incubation / Emergence	X			X	X	X				X		X	X	X		X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	7	2
	Juvenile	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
Chinook Salmon	Adult	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
	Incubation / Emergence	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	9	2
	Juvenile	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
Chum Salmon	Adult	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
	Incubation / Emergence	X			X	X	X				X		X	X			X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	7	1
	Juvenile	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
Coastal Cutthrout Trout	Adult	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
	Incubation / Emergence	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	9	2
	Juvenile	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3

		Aqua-culture		Overwater Structures									Outfalls				Utilities					Transportation				Flood / Erosion Control			Mitigation / Enhancement			Misc.			
Species	LifeStage	Finfish	Shellfish	Log Booming and Storage	Docks and Wharves	Boat Ramp/Launch/Hoist	Nearshore Buildings	Mooring Buoys	Floats and Rafts	Floating Homes	Marinas	Shipyards & Terminal	Stormwater	Industrial and Municipal	Combined Sewer Overflow	Desalinization	Cables	Water Pipeline	Sewage Pipelines	Oil/Gas Pipelines	Water Intakes	Roads	Railroads	Bridges	Ferries	Fill and Bank Armoring	Dike/Dam	Breakwater	Conservation	Contamination and Remediation	Artificial Habitat	Sediment Removal	Public Access	Nexus Count	Species/Activity Overlap Rank[1]
Coho Salmon	Adult	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
	Incubation / Emergence	X			X	X	X				X		X	X	X		X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	7	2
	Juvenile	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
Copper Rockfish	Adult	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X		X	8	2
	Juvenile	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	9	3
	Larvae	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	9	3
Olympic Mudminnow	All																																	0	1
Pacific Cod	Adult			X				X	X				X	X	X	X	X			X		X	X	X	X				X	X	X		X	5	1
	Juvenile																																	0	1
	Larvae																																	0	1
	Egg			X				X	X				X	X	X	X	X			X		X	X	X	X				X	X	X		X	5	1
Pacific Hake	Adult			X				X	X				X	X	X	X	X			X		X	X	X	X				X	X	X		X	5	1
	Juvenile																																	0	1
	Larvae			X				X	X				X	X	X	X	X			X		X	X	X	X				X	X	X		X	5	1
Pacific Herring	Adult	X	X	X	X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	9	3
	Juvenile	X	X	X	X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	9	3
	Egg / Larvae	X	X	X	X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	9	3
Pink Salmon	Adul	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
	Incubation / Emergence																																	0	1
	Juvenile	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
Pygmy Whitefish	Adult			X	X			X			X			X			X	X			X	X		X	X		X				X		X	4	1
	Juvenile			X	X			X			X			X			X	X			X	X		X	X		X				X		X	4	1
	Egg / Incubation			X	X			X			X			X			X	X			X	X		X	X		X				X		X	4	1
Quillback Rockfish	Adult	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	9	3
	Juvenile	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	9	3
	Larvae	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	9	3

		Aqua-culture		Overwater Structures									Outfalls				Utilities					Transportation				Flood / Erosion Control			Mitigation / Enhancement			Misc.			
Species	LifeStage	Finfish	Shellfish	Log Booming and Storage	Docks and Wharves	Boat Ramp/Launch/Hoist	Nearshore Buildings	Mooring Buoys	Floats and Rafts	Floating Homes	Marinas	Shipyards & Terminal	Stormwater	Industrial and Municipal	Combined Sewer Overflow	Desalinization	Cables	Water Pipeline	Sewage Pipelines	Oil/Gas Pipelines	Water Intakes	Roads	Railroads	Bridges	Ferries	Fill and Bank Armoring	Dike/Dam	Breakwater	Conservation	Contamination and Remediation	Artificial Habitat	Sediment Removal	Public Access	Nexus Count	Species/Activity Overlap Rank[1]
Sockeye Salmon	Adult	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
	Incubation / Emergence			X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	8	2
	Juvenile	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
Steelhead Trout	Adul	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
	Incubation / Emergence	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	9	2
	Juvenile	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
Walleye Pollock	Adult	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
	Juvenile	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
	Larvae	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
White Sturgeon	Adult	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
	Juvenile	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
	Egg / Larvae	X		X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	9	2
Olympia Oyster	Adult	X	X	X	X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
	Larvae / Juvenile	X	X	X	X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
Pinto Abalone	Adult	X	X	X	X	X	X	X	X		X	X	X	X		X	X	X	X		X	X		X	X	X		X	X				X	6	2
	Juvenile	X	X	X	X	X	X	X	X		X	X	X	X		X	X	X	X		X	X		X	X	X		X	X				X	6	2
	Egg	X	X	X	X	X	X	X	X		X	X	X	X		X	X	X	X		X	X		X	X	X		X	X			X	X	7	2
Humpback Whale	All			X				X	X				X	X	X	X	X			X		X	X	X	X				X	X	X		X	5	1
Killer Whale	Resident	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
	Transient	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9	3
Northern Sea Otter	All				X		X		X		X			X			X							X				X						1	1
Persistent - sepal Yellowcress	All										X						X																X	2	1
Water Howellia	All																																	0	1

		Aqua-culture		Overwater Structures									Outfalls				Utilities					Transportation				Flood / Erosion Control			Mitigation / Enhancement			Misc.			
Species	LifeStage	Finfish	Shellfish	Log Booming and Storage	Docks and Wharves	Boat Ramp/Launch/Hoist	Nearshore Buildings	Mooring Buoys	Floats and Rafts	Floating Homes	Marinas	Shipyards & Terminal	Stormwater	Industrial and Municipal	Combined Sewer Overflow	Desalinization	Cables	Water Pipeline	Sewage Pipelines	Oil/Gas Pipelines	Water Intakes	Roads	Railroads	Bridges	Ferries	Fill and Bank Armoring	Dike/Dam	Breakwater	Conservation	Contamination and Remediation	Artificial Habitat	Sediment Removal	Public Access	Nexus Count	Species/Activity Overlap Rank[1]
Water Lobelia	All				X																													0	1

Appendix F – Township and Species Habitat Nexus

Group	Species	Lifestage	Townships			Coincident Habitat Rank[1]
			Activity Nexus (#)	Considered Habitat (#)	Activity Nexus (%)	
Amphibians and Reptile	Coastal Tailed Frog	Adult	106	418	25%	1
		Egg	106	418	25%	1
		Tadpole	106	418	25%	1
	Columbia Spotted Frog	Adult	120	358	34%	1
		Egg	120	358	34%	1
		Tadpole	120	358	34%	1
	Northern Leopard Frog	Adult	65	122	53%	2
	Western Toad	Adult	359	833	43%	2
		Egg	359	833	43%	2
		Tadpole	359	833	43%	2
	Western Pond Turtle	Foraging	44	68	65%	2
		Over-wintering	28	68	41%	2
Birds	Bald Eagle	Non-nesting	471	1016	46%	2
		Nesting	489	1016	48%	2
	Black Tern	Migration	128	396	32%	1
		Nesting	128	396	32%	1
	California Brown Pelican	Migration	171	228	75%	3
	Common Loon	Non-nesting	406	1016	40%	2
		Nesting	141	1016	14%	1
	Common Murre	Nesting	162	514	32%	1
		Wintering	162	514	32%	1
	Eared Grebe	Wintering	289	1016	28%	1
	Harlequin Duck	Nesting	73	204	36%	2
		Non-nesting	132	204	65%	2
	Marbled Murrelet	Nesting	174	420	41%	2
		Non-nesting	174	420	41%	2
	Tufted Puffin	Nesting	112	208	54%	2
		Wintering (>3mi offshore)	2	208	1%	1
	Western Snowy Plover	Breeding	12	13	92%	3
		Wintering	12	13	92%	3
Fish	Brown Rockfish	Adult / Partuition	62	63	98%	3
		Benthic Juvenile	62	63	98%	3
		Pelagic Larvae	62	63	98%	3
	Bull Trout	Adult	386	715	54%	2
		Juvenile	386	715	54%	2
		Incubation / Emergence	104	715	15%	1

[1] Coincident Habitat Rank: 1 = 0 - 34% of total habitat (by township) that is potentially affected by authorized activity, 2 = 35 - 66% of total habitat (by township), 3 = 67 - 100%.

		Townships			
Chinook Salmon	Adult	427	728	59%	2
	Juvenile	427	728	59%	2
	Incubation / Emergence	221	728	30%	1
Chum Salmon	Adult	289	447	65%	2
	Juvenile	289	447	65%	2
	Incubation / Emergence	101	447	23%	1
Coastal Cutthrout Trout	Adult	303	487	62%	2
	Juvenile	303	487	62%	2
	Incubation / Emergence	145	487	30%	1
Coho Salmon	Adult	379	613	62%	2
	Juvenile	379	613	62%	2
	Incubation / Emergence	120	613	20%	1
Copper Rockfish	Adult / Partuition	107	186	58%	2
	Benthic Juvenile	145	186	78%	3
	Pelagic Larvae	145	186	78%	3
Pacific Cod	Adult / Spawning	109	176	62%	2
	Egg	109	176	62%	2
Pacific Hake	Adult / Spawning	109	176	62%	2
	Pelagic Larvae	109	176	62%	2
Pacific Herring	Adult	77	80	96%	3
	Egg / Larvae	73	80	91%	3
	Juvenile	77	80	96%	3
Pink Salmon	Adult	171	332	52%	2
	Juvenile	171	332	52%	2
Pygmy Whitefish	Adult / Spawning	16	30	53%	2
	Egg / Incubation	16	30	53%	2
	Juvenile	16	30	53%	2
Quillback Rockfish	Adult / Partuition	127	153	83%	3
	Benthic Juvenile	127	153	83%	3
	Pelagic Larvae	127	153	83%	3
Sockeye Salmon	Adult	363	552	66%	2
	Juvenile	363	552	66%	2
	Incubation / Emergence	90	552	16%	1
Steelhead Trout	Adult	427	749	57%	2
	Juvenile	427	749	57%	2
	Incubation / Emergence	295	749	39%	2

			Townships			
	Walleye Pollock	Adult / Spawning	140	209	67%	3
		Benthic Juvenile	140	209	67%	3
		Pelagic Larvae	140	209	67%	3
	White Sturgeon	Adult / Spawning	291	445	65%	2
		Egg / Larvae	46	445	10%	1
		Juvenile	154	445	35%	2
Invertebrates	Olympia Oyster	Adult / Spawning	54	75	72%	3
		Larvae / Juvenile	54	75	72%	3
	Pinto Abalone	Adult	28	35	80%	3
		Egg	30	35	86%	3
		Juvenile	28	35	80%	3
Marine Mammals	Humpback Whale	All	115	209	55%	2
	Killer Whale	Resident	153	209	73%	3
		Transient	153	209	73%	3
	Northern Sea Otter	All	5	22	23%	1
Plants	Persistent-sepal Yellowcress	All	2	13	15%	1
	Water Lobelia	All	1	7	14%	1

Appendix G – Species Effects Indices and Adjusted Effects Indices

Aquaculture

AMPHIBIANS AND REPTILE

Columbia Spotted Frog and Northern Leopard Frog, Western Toad

	Effects and Pathways	Shellfish[1]			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Adult	**Direct Effect**						
	Species level						
	Increased activity	NA			x		
	Impair behavior/timing patterns	NA			x		
	Physical harm or harassment	NA			--		
	Assigned Effect Index Value[2]	NA	1	NA	0.25	1	0.25
	Habitat level						
	Air quality impairment (acute levels)	NA			--		
	Water impairment (acute levels)	NA			--		
	Sediment quality impairment (acute levels)	NA			--		
	Permanent habitat destruction/displacement	NA			x		
	Permanently inaccessible habitat	NA			--		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	NA			x		
	Temporarily inaccessible	NA			x		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25

[1] x = Sources of effect,; = Absence of effect; NA = Absence of interaction

[2] Ranks: Effects Index and Adjusted Effects Index r values: 1= total loss; 0.75 = high effect; 0.5 = moderate effect; 0.25 = low effect; 0 = trace effect Net Conservation Measure Index ranks: 1= No effectiveness; 0.75 = low effectiveness; 0.5 = moderate effectiveness; 0.25 = high effectiveness; 0 = Total effectiveness

	Effects and Pathways	Shellfish[1]			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Habitat degradation						
	Energy resource reduction	NA			x		
	Air quality impairment (chronic levels)	NA			--		
	Water quality impairment (chronic levels)	NA			--		
	Sediment quality impairment (chronic levels)	NA			--		
	Reduction of structural habitat quality metrics	NA			x		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Average Direct Effects	NA		NA	0.25		0.25
	Average Effects Index	NA		NA	0.25		0.25
	Magnitude of Effects	**NA**		**NA**	**0.25**		**0.25**
Tadpole	**Direct Effect**						
	Species level						
	Increased activity	NA			x		
	Impair behavior/timing patterns	NA			x		
	Physical harm or harassment	NA			--		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Habitat level						
	Air quality impairment (acute levels)	NA			--		
	Water impairment (acute levels)	NA			--		
	Sediment quality impairment (acute levels)	NA			--		
	Permanent habitat destruction/displacement	NA			x		
	Permanently inaccessible habitat	NA			--		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	NA			x		
	Temporarily inaccessible	NA			x		

	Effects and Pathways	Shellfish[1]			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Habitat degradation						
	Energy resource reduction	NA			x		
	Air quality impairment (chronic levels)	NA			--		
	Water quality impairment (chronic levels)	NA			--		
	Sediment quality impairment (chronic levels)	NA			--		
	Reduction of structural habitat quality metrics	NA			x		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Average Direct Effects	NA		NA	0.25		0.25
	Average Effects Index	NA		NA	0.25		0.25
	Magnitude of Effects	**NA**		**NA**	**0.25**		**0.25**
Egg	**Direct Effect**						
	Species level						
	Increased activity	NA			x		
	Impair behavior/timing patterns	NA			x		
	Physical harm or harassment	NA			--		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Habitat level						
	Air quality impairment (acute levels)	NA			--		
	Water impairment (acute levels)	NA			--		
	Sediment quality impairment (acute levels)	NA			--		
	Permanent habitat destruction/displacement	NA			x		
	Permanently inaccessible habitat	NA			--		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	NA			x		
	Temporarily inaccessible	NA			x		

	Effects and Pathways	Shellfish[1]			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Habitat degradation						
	Energy resource reduction	NA			x		
	Air quality impairment (chronic levels)	NA			--		
	Water quality impairment (chronic levels)	NA			--		
	Sediment quality impairment (chronic levels)	NA			--		
	Reduction of structural habitat quality metrics	NA			x		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Average Direct Effects	NA		NA	0.25		0.25
	Average Effects Index	NA		NA	0.25		0.25
	Magnitude of Effects	**NA**		**NA**	**0.25**		**0.25**

Western Pond Turtle

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Foraging, Migratory	*Species level*						
	Increased activity	NA			NA		
	Impair behavior/timing patterns	NA			NA		
	Physical harm or harassment	NA			NA		
	Assigned Effect Index Value	NA	1	NA	NA	1	NA
	Habitat level						
	Air quality impairment (acute levels)	NA			NA		
	Water impairment (acute levels)	NA			NA		
	Sediment quality impairment (acute levels)	NA			NA		

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Permanent habitat destruction/displacement	NA			NA		
	Permanently inaccessible habitat	NA			NA		
	Assigned Effect Index Value	NA	1	NA	NA	1	NA
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	NA			NA		
	Temporarily inaccessible	NA			NA		
	Assigned Effect Index Value	NA	1	NA	NA	1	NA
	Habitat degradation						
	Energy resource reduction	NA			NA		
	Air quality impairment (chronic levels)	NA			NA		
	Water quality impairment (chronic levels)	NA			NA		
	Sediment quality impairment (chronic levels)	NA			NA		
	Reduction of structural habitat quality metrics	NA			NA		
	Assigned Effect Index Value	NA	1	NA	NA	1	NA
	Average Direct Effects	NA		NA	NA		NA
	Average Effects Index	NA		NA	NA		NA
	Magnitude of Effects	**NA**		**NA**	**NA**		**NA**
Overwintering	**Direct Effects**						
	Species level						
	Increased activity	NA			NA		
	Impair behavior/timing patterns	NA			NA		
	Physical harm or harassment	NA			NA		
	Assigned Effect Index Value	NA	1	NA	NA	1	NA
	Habitat level						
	Air quality impairment (acute levels)	NA			NA		
	Water impairment (acute levels)	NA			NA		

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	**Net Conservation Measure Index**	**Adjusted Effects Index**	**Effects Index**	**Net Conservation Measure Index**	**Adjusted Effects Index**
	Sediment quality impairment (acute levels)	NA			NA		
	Permanent habitat destruction/displacement	NA			NA		
	Permanently inaccessible habitat	NA			NA		
	Assigned Effect Index Value	NA	1	NA	NA	1	NA
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	NA			NA		
	Temporarily inaccessible	NA			NA		
	Assigned Effect Index Value	NA	1	NA	NA	1	NA
	Habitat degradation						
	Energy resource reduction	NA			NA		
	Air quality impairment (chronic levels)	NA			NA		
	Water quality impairment (chronic levels)	NA			NA		
	Sediment quality impairment (chronic levels)	NA			NA		
	Reduction of structural habitat quality metrics	NA			NA		
	Assigned Effect Index Value	NA	1	NA	NA	1	NA
	Average Direct Effects	NA		NA	NA		NA
	Average Effects Index	NA		NA	NA		NA
	Magnitude of Effects	**NA**		**NA**	**NA**		**NA**

BIRDS

Bald eagle

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Non-nesting	**Direct Effect**						
	Species level						
	Increased activity	x			x		
	Impair behavior/timing patterns	x			x		
	Physical harm or harassment	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Habitat level						
	Air quality impairment (acute levels)	--			--		
	Water impairment (acute levels)	--			--		
	Sediment quality impairment (acute levels)	--			--		
	Permanent habitat destruction/displacement	x			x		
	Permanently inaccessible habitat	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	x			x		
	Temporarily inaccessible	x			x		
	Assigned Effect Index Value	0.25	1	0.25	0.25	1	0.25
	Habitat degradation						
	Energy resource reduction	x			x		
	Air quality impairment (chronic levels)	--			--		
	Water quality impairment (chronic levels)	--			x		
	Sediment quality impairment (chronic levels)	--			x		
	Reduction of structural habitat quality metrics	x			x		

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Average Direct Effects	0.25		0.19	0.25		0.19
	Average Effects Index	0.25		0.20	0.25		0.20
	Magnitude of Effects	**0.25**		**0.20**	**0.25**		**0.20**
Nesting	**Direct Effect**						
	Species level						
	Increased activity	x			x		
	Impair behavior/timing patterns	x			x		
	Physical harm or harassment	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Habitat level						
	Air quality impairment (acute levels)	--			--		
	Water impairment (acute levels)	--			--		
	Sediment quality impairment (acute levels)	--			--		
	Permanent habitat destruction/displacement	x			x		
	Permanently inaccessible habitat	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	x			x		
	Temporarily inaccessible	x			x		
	Assigned Effect Index Value	0.25	1	0.25	0.25	1	0.25
	Habitat degradation						
	Energy resource reduction	x			x		
	Air quality impairment (chronic levels)	--			--		
	Water quality impairment (chronic levels)	--			x		
	Sediment quality impairment (chronic levels)	--			x		

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Reduction of structural habitat quality metrics	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Average Direct Effects	0.25		0.19	0.25		0.19
	Average Effects Index	0.25		0.20	0.25		0.20
	Magnitude of Effects	**0.25**		**0.20**	**0.25**		**0.20**

Black tern

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Migration	**Direct Effect**						
	Species level						
	Increased activity	NA			NA		
	Impair behavior/timing patterns	NA			NA		
	Physical harm or harassment	NA			NA		
	Assigned Effect Index Value	NA	0.75	NA	NA	0.75	NA
	Habitat level						
	Air quality impairment (acute levels)	NA			NA		
	Water impairment (acute levels)	NA			NA		
	Sediment quality impairment (acute levels)	NA			NA		
	Permanent habitat destruction/displacement	NA			NA		
	Permanently inaccessible habitat	NA			NA		
	Assigned Effect Index Value	NA	0.75	NA	NA	0.75	NA
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	NA			NA		
	Temporarily inaccessible	NA			NA		

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Assigned Effect Index Value	NA	1	NA	NA	1	NA
	Habitat degradation						
	Energy resource reduction	NA			NA		
	Air quality impairment (chronic levels)	NA			NA		
	Water quality impairment (chronic levels)	NA			NA		
	Sediment quality impairment (chronic levels)	NA			NA		
	Reduction of structural habitat quality metrics	NA			NA		
	Assigned Effect Index Value	NA	0.75	NA	NA	0.75	NA
	Average Direct Effects	NA		NA	NA		NA
	Average Effects Index	NA		NA	NA		NA
	Magnitude of Effects	**NA**		**NA**	**NA**		**NA**
Nesting	Increased activity	NA			NA		
	Impair behavior/timing patterns	NA			NA		
	Physical harm or harassment	NA			NA		
	Assigned Effect Index Value	NA	0.75	NA	NA	0.75	NA
	Habitat level						
	Air quality impairment (acute levels)	NA			NA		
	Water impairment (acute levels)	NA			NA		
	Sediment quality impairment (acute levels)	NA			NA		
	Permanent habitat destruction/displacement	NA			NA		
	Permanently inaccessible habitat	NA			NA		
	Assigned Effect Index Value	NA	0.75	NA	NA	0.75	NA
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	NA			NA		

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Temporarily inaccessible	NA			NA		
	Assigned Effect Index Value	NA	1	NA	NA	1	NA
	Habitat degradation						
	Energy resource reduction	NA			NA		
	Air quality impairment (chronic levels)	NA			NA		
	Water quality impairment (chronic levels)	NA			NA		
	Sediment quality impairment (chronic levels)	NA			NA		
	Reduction of structural habitat quality metrics	NA			NA		
	Assigned Effect Index Value	NA	0.75	NA	NA	0.75	NA
	Average Direct Effects	NA		NA	NA		NA
	Average Effects Index	NA		NA	NA		NA
	Magnitude of Effects	**NA**		**NA**	**NA**		**NA**

Brown pelican

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Resident / Non-breeding	*Species level*						
	Increased activity	x			x		
	Impair behavior/timing patterns	x			x		
	Physical harm or harassment	--			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.5	0.75	0.38
	Habitat level						
	Air quality impairment (acute levels)	--			--		
	Water impairment (acute levels)	--			--		
	Sediment quality impairment (acute levels)	--			--		
	Permanent habitat destruction/displacement	x			x		

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Permanently inaccessible habitat	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	x			x		
	Temporarily inaccessible	x			x		
	Assigned Effect Index Value	0.25	1	0.25	0.25	1	0.25
	Habitat degradation						
	Energy resource reduction	--			--		
	Air quality impairment (chronic levels)	--			--		
	Water quality impairment (chronic levels)	x			x		
	Sediment quality impairment (chronic levels)	x			x		
	Reduction of structural habitat quality metrics	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Average Direct Effects	0.25		0.19	0.38		0.28
	Average Effects Index	0.25		0.20	0.31		0.25
	Magnitude of Effects	**0.25**		**0.20**	**0.38**		**0.28**

Common loon

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Non-nesting	**Direct Effect**						
	Species level						
	Increased activity	x			x		
	Impair behavior/timing patterns	x			x		
	Physical harm or harassment	--			--		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Habitat level						
	Air quality impairment (acute levels)	--			--		
	Water impairment (acute levels)	--			--		
	Sediment quality impairment (acute levels)	--			--		
	Permanent habitat destruction/displacement	x			x		
	Permanently inaccessible habitat	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	x			x		
	Temporarily inaccessible	x			x		
	Assigned Effect Index Value	0.25	1	0.25	0.25	1	0.25
	Habitat degradation						
	Energy resource reduction	--			--		
	Air quality impairment (chronic levels)	x			x		
	Water quality impairment (chronic levels)	--			--		
	Sediment quality impairment (chronic levels)	--			--		
	Reduction of structural habitat quality metrics	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Average Direct Effects	0.25		0.19	0.25		0.19

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Average Effects Index	0.25		0.20	0.25		0.20
	Magnitude of Effects	**0.25**		**0.20**	**0.25**		**0.20**
Nesting	**Direct Effect**						
	Species level						
	Increased activity	NA			x		
	Impair behavior/timing patterns	NA			x		
	Physical harm or harassment	NA			x		
	Assigned Effect Index Value	NA	0.75	NA	0.25	0.75	0.19
	Habitat level						
	Air quality impairment (acute levels)	NA			--		
	Water impairment (acute levels)	NA			--		
	Sediment quality impairment (acute levels)	NA			--		
	Permanent habitat destruction/displacement	NA			x		
	Permanently inaccessible habitat	NA			x		
	Assigned Effect Index Value	NA	0.75	NA	0.25	0.75	0.19
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	NA			x		
	Temporarily inaccessible	NA			--		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Habitat degradation						
	Energy resource reduction	NA			x		
	Air quality impairment (chronic levels)	NA			--		
	Water quality impairment (chronic levels)	NA			--		
	Sediment quality impairment (chronic levels)	NA			--		
	Reduction of structural habitat quality metrics	NA			x		
	Assigned Effect Index Value	NA	0.75	NA	0.25	0.75	0.19

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Average Direct Effects	NA		NA	0.25		0.19
	Average Effects Index	NA		NA	0.25		0.20
	Magnitude of Effects	**NA**		**NA**	**0.25**		**0.20**

Harlequin duck

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Non-nesting	**Direct Effect**						
	Species level						
	Increased activity	x			x		
	Impair behavior/timing patterns	x			x		
	Physical harm or harassment	--			--		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Habitat level						
	Air quality impairment (acute levels)	--			--		
	Water impairment (acute levels)	--			--		
	Sediment quality impairment (acute levels)	--			--		
	Permanent habitat destruction/displacement	x			x		
	Permanently inaccessible habitat	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	x			x		
	Temporarily inaccessible	x			x		

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Assigned Effect Index Value	0.25	1	0.25	0.25	1	0.25
	Habitat degradation						
	Energy resource reduction	--			--		
	Air quality impairment (chronic levels)	--			--		
	Water quality impairment (chronic levels)	x			x		
	Sediment quality impairment (chronic levels)	--			--		
	Reduction of structural habitat quality metrics	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Average Direct Effects	0.25		0.19	0.25		0.19
	Average Effects Index	0.25		0.20	0.25		0.20
	Magnitude of Effects	**0.25**		**0.20**	**0.25**		**0.20**
Nesting	**Direct Effect**						
	Species level						
	Increased activity	NA			x		
	Impair behavior/timing patterns	NA			x		
	Physical harm or harassment	NA			--		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Habitat level						
	Air quality impairment (acute levels)	NA			--		
	Water impairment (acute levels)	NA			--		
	Sediment quality impairment (acute levels)	NA			--		
	Permanent habitat destruction/displacement	NA			x		
	Permanently inaccessible habitat	NA			--		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Indirect Effect						

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Habitat loss						
	Temporary destruction/displacement	NA			x		
	Temporarily inaccessible	NA			x		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Habitat degradation						
	Energy resource reduction	NA			x		
	Air quality impairment (chronic levels)	NA			--		
	Water quality impairment (chronic levels)	NA			--		
	Sediment quality impairment (chronic levels)	NA			--		
	Reduction of structural habitat quality metrics	NA			x		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Average Direct Effects	NA		NA	0.25		0.25
	Average Effects Index	NA		NA	0.25		0.25
	Magnitude of Effects	**NA**		**NA**	**0.25**		**0.25**

Marbled murrelet

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Non-nesting	**Direct Effect**						
	Species level						
	Increased activity	x			x		
	Impair behavior/timing patterns	x			x		
	Physical harm or harassment	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Habitat level						
	Air quality impairment (acute levels)	--			--		

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Water impairment (acute levels)	--			--		
	Sediment quality impairment (acute levels)	--			--		
	Permanent habitat destruction/displacement	x			x		
	Permanently inaccessible habitat	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	x			x		
	Temporarily inaccessible	x			x		
	Assigned Effect Index Value	0.25	1	0.25	0.25	1	0.25
	Habitat degradation						
	Energy resource reduction	x			x		
	Air quality impairment (chronic levels)	--			--		
	Water quality impairment (chronic levels)	--			x		
	Sediment quality impairment (chronic levels)	--			x		
	Reduction of structural habitat quality metrics	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Average Direct Effects	0.25		0.19	0.25		0.19
	Average Effects Index	0.25		0.20	0.25		0.20
	Magnitude of Effects	**0.25**		**0.20**	**0.25**		**0.20**
Nesting	**Direct Effect**						
	Species level						
	Increased activity	x			x		
	Impair behavior/timing patterns	x			x		
	Physical harm or harassment	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Habitat level						

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Air quality impairment (acute levels)	--			--		
	Water impairment (acute levels)	--			--		
	Sediment quality impairment (acute levels)	--			--		
	Permanent habitat destruction/displacement	x			x		
	Permanently inaccessible habitat	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	x			x		
	Temporarily inaccessible	x			x		
	Assigned Effect Index Value	0.25	1	0.25	0.25	1	0.25
	Habitat degradation						
	Energy resource reduction	x			x		
	Air quality impairment (chronic levels)	--			--		
	Water quality impairment (chronic levels)	--			x		
	Sediment quality impairment (chronic levels)	--			x		
	Reduction of structural habitat quality metrics	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Average Direct Effects	0.25		0.19	0.25		0.19
	Average Effects Index	0.25		0.20	0.25		0.20
	Magnitude of Effects	**0.25**		**0.20**	**0.25**		**0.20**

WESTERN SNOWY PLOVER

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Wintering	**Direct Effect**						
	Species level						
	Increased activity	x			NA		
	Impair behavior/timing patterns	x			NA		
	Physical harm or harassment	x			NA		
	Assigned Effect Index Value	0.5	0.75	0.38	NA	0.75	NA
	Habitat level						
	Air quality impairment (acute levels)	--			NA		
	Water impairment (acute levels)	--			NA		
	Sediment quality impairment (acute levels)	--			NA		
	Permanent habitat destruction/displacement	x			NA		
	Permanently inaccessible habitat	x			NA		
	Assigned Effect Index Value	0.75	0.75	0.56	NA	0.75	NA
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	x			NA		
	Temporarily inaccessible	--			NA		
	Assigned Effect Index Value	0.5	1	0.50	NA	1	NA
	Habitat degradation						
	Energy resource reduction	x			NA		
	Air quality impairment (chronic levels)	--			NA		
	Water quality impairment (chronic levels)	--			NA		
	Sediment quality impairment (chronic levels)	--			NA		
	Reduction of structural habitat quality metrics	x			NA		
	Assigned Effect Index Value	0.5	0.75	0.38	NA	0.75	NA
	Average Direct Effects	0.63		0.47	NA		NA

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Average Effects Index	0.56		0.45	NA		NA
	Magnitude of Effects	**0.63**		**0.47**	**NA**		**NA**
Nesting	**Direct Effect**						
	Species level						
	Increased activity	x			NA		
	Impair behavior/timing patterns	x			NA		
	Physical harm or harassment	x			NA		
	Assigned Effect Index Value	0.5	0.75	0.38	NA	0.75	NA
	Habitat level						
	Air quality impairment (acute levels)	--			NA		
	Water impairment (acute levels)	--			NA		
	Sediment quality impairment (acute levels)	--			NA		
	Permanent habitat destruction/displacement	x			NA		
	Permanently inaccessible habitat	x			NA		
	Assigned Effect Index Value	0.5	0.75	0.38	NA	0.75	NA
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	x			NA		
	Temporarily inaccessible	--			NA		
	Assigned Effect Index Value	0.5	1	0.50	NA	1	NA
	Habitat degradation						
	Energy resource reduction	x			NA		
	Air quality impairment (chronic levels)	--			NA		
	Water quality impairment (chronic levels)	--			NA		
	Sediment quality impairment (chronic levels)	--			NA		
	Reduction of structural habitat quality metrics	x			NA		
	Assigned Effect Index Value	0.5	0.75	0.38	NA	0.75	NA

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Average Direct Effects	0.50		0.38	NA		NA
	Average Effects Index	0.50		0.41	NA		NA
	Magnitude of Effects	**0.50**		**0.41**	**NA**		**NA**

FISH

Pacific salmon, trout and char

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Adult	**Direct Effect**						
	Species level						
	Increased activity	x			x		
	Impair behavior/timing patterns	x			x		
	Physical harm or harassment	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Habitat level						
	Air quality impairment (acute levels)	--			--		
	Water impairment (acute levels)	--			--		
	Sediment quality impairment (acute levels)	--			--		
	Permanent habitat destruction/displacement	x			x		
	Permanently inaccessible habitat	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	x			x		

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Temporarily inaccessible	x			x		
	Assigned Effect Index Value	0.25	1	0.25	0.25	1	0.25
	Habitat degradation						
	Energy resource reduction	x			x		
	Air quality impairment (chronic levels)	--			--		
	Water quality impairment (chronic levels)	--			x		
	Sediment quality impairment (chronic levels)	--			x		
	Reduction of structural habitat quality metrics	x			x		
	Assigned Effect Index Value	0.25	1	0.25	0.25	1	0.25
	Average Direct Effects	0.25		0.19	0.25		0.19
	Average Effects Index	0.25		0.22	0.25		0.22
	Magnitude of Effects	**0.25**		**0.22**	**0.25**		**0.22**
Incubation / Emergence	**Direct Effect**						
	Species level						
	Increased activity	NA			x		
	Impair behavior/timing patterns	NA			x		
	Physical harm or harassment	NA			--		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Habitat level						
	Air quality impairment (acute levels)	NA			--		
	Water impairment (acute levels)	NA			--		
	Sediment quality impairment (acute levels)	NA			--		
	Permanent habitat destruction/displacement	NA			x		
	Permanently inaccessible habitat	NA			--		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Indirect Effect						
	Habitat loss						

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Temporary destruction/displacement	NA			x		
	Temporarily inaccessible	NA			x		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Habitat degradation						
	Energy resource reduction	NA			x		
	Air quality impairment (chronic levels)	NA			--		
	Water quality impairment (chronic levels)	NA			--		
	Sediment quality impairment (chronic levels)	NA			--		
	Reduction of structural habitat quality metrics	NA			x		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Average Direct Effects	NA		NA	0.25		0.25
	Average Effects Index	NA		NA	0.25		0.25
	Magnitude of Effects	**NA**		**NA**	**0.25**		**0.25**
Freshwater Rearing / Outmigration	**Direct Effect**						
	Species level						
	Increased activity	x			x		
	Impair behavior/timing patterns	x			x		
	Physical harm or harassment	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Habitat level						
	Air quality impairment (acute levels)	--			--		
	Water impairment (acute levels)	--			--		
	Sediment quality impairment (acute levels)	--			--		
	Permanent habitat destruction/displacement	x			x		
	Permanently inaccessible habitat	x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19
	Indirect Effect						
	Habitat loss						

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Temporary destruction/displacement	x			x		
	Temporarily inaccessible	x			x		
	Assigned Effect Index Value	0.25	1	0.25	0.25	1	0.25
	Habitat degradation						
	Energy resource reduction	x			x		
	Air quality impairment (chronic levels)	--			--		
	Water quality impairment (chronic levels)	--			x		
	Sediment quality impairment (chronic levels)	--			x		
	Reduction of structural habitat quality metrics	x			x		
	Assigned Effect Index Value	0.25	1	0.25	0.25	1	0.25
	Average Direct Effects	0.25		0.19	0.25		0.19
	Average Effects Index	0.25		0.22	0.25		0.22
	Magnitude of Effects	**0.25**		**0.22**	**0.25**		**0.22**

Green sturgeon

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Adult	**Direct Effect**						
	Species level						
	Increased activity	--			x		
	Impair behavior/timing patterns	--			--		
	Physical harm or harassment	x			x		
	Assigned Effect Index Value	0.25	0.25	0.06	0.25	0.25	0.06
	Habitat level						
	Air quality impairment (acute levels)	--			--		

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Water impairment (acute levels)	--			--		
	Sediment quality impairment (acute levels)	--			--		
	Permanent habitat destruction/displacement	x			--		
	Permanently inaccessible habitat	x			x		
	Assigned Effect Index Value	0.5	0.75	0.38	0.25	0.75	0.19
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	x			x		
	Temporarily inaccessible	x			x		
	Assigned Effect Index Value	0.5	0.75	0.38	0.25	0.75	0.19
	Habitat degradation						
	Energy resource reduction	x			--		
	Air quality impairment (chronic levels)	--			--		
	Water quality impairment (chronic levels)	x			x		
	Sediment quality impairment (chronic levels)	x			x		
	Reduction of structural habitat quality metrics	x			--		
	Assigned Effect Index Value	0.75	0.75	0.56	0.5	0.75	0.38
	Average Direct Effects	0.38		0.22	0.25		0.13
	Average Effects Index	0.50		0.34	0.31		0.20
	Magnitude of Effects	**0.50**		**0.34**	**0.31**		**0.20**

White sturgeon

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Adult	**Direct Effect**						
	Species level						
	Increased activity	--			x		
	Impair behavior/timing patterns	--			x		
	Physical harm or harassment	x			x		
	Assigned Effect Index Value	0.25	0.25	0.06	0.25	0.25	0.06
	Habitat level						
	Air quality impairment (acute levels)	--			--		
	Water impairment (acute levels)	--			x		
	Sediment quality impairment (acute levels)	--			--		
	Permanent habitat destruction/displacement	x			x		
	Permanently inaccessible habitat	x			x		
	Assigned Effect Index Value	0.5	0.75	0.38	0.25	0.75	0.19
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	x			x		
	Temporarily inaccessible	x			x		
	Assigned Effect Index Value	0.5	0.75	0.38	0.25	0.75	0.19
	Habitat degradation						
	Energy resource reduction	x			x		
	Air quality impairment (chronic levels)	--			--		
	Water quality impairment (chronic levels)	x			x		
	Sediment quality impairment (chronic levels)	x			x		
	Reduction of structural habitat quality metrics	x			x		
	Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38
	Average Direct Effects	0.38		0.22	0.25		0.13

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Average Effects Index	0.44		0.30	0.31		0.20
	Magnitude of Effects	**0.44**		**0.30**	**0.31**		**0.20**
Larvae	**Direct Effect**						
	Species level						
	Increased activity	NA			x		
	Impair behavior/timing patterns	NA			x		
	Physical harm or harassment	NA			x		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Habitat level						
	Air quality impairment (acute levels)	NA			--		
	Water impairment (acute levels)	NA			x		
	Sediment quality impairment (acute levels)	NA			--		
	Permanent habitat destruction/displacement	NA			x		
	Permanently inaccessible habitat	NA			x		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	NA			x		
	Temporarily inaccessible	NA			x		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Habitat degradation						
	Energy resource reduction	NA			x		
	Air quality impairment (chronic levels)	NA			--		
	Water quality impairment (chronic levels)	NA			x		
	Sediment quality impairment (chronic levels)	NA			x		
	Reduction of structural habitat quality metrics	NA			x		
	Assigned Effect Index Value	NA	1	NA	0.5	1	0.50

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Average Direct Effects	NA		NA	0.25		0.25
	Average Effects Index	NA		NA	0.31		0.31
	Magnitude of Effects	**NA**		**NA**	**0.31**		**0.31**
Egg / Incubation	**Direct Effect**						
	Species level						
	Increased activity	NA			x		
	Impair behavior/timing patterns	NA			x		
	Physical harm or harassment	NA			x		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Habitat level						
	Air quality impairment (acute levels)	NA			--		
	Water impairment (acute levels)	NA			x		
	Sediment quality impairment (acute levels)	NA			--		
	Permanent habitat destruction/displacement	NA			x		
	Permanently inaccessible habitat	NA			x		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Indirect Effect						
	Habitat loss						
	Temporary destruction/displacement	NA			x		
	Temporarily inaccessible	NA			x		
	Assigned Effect Index Value	NA	1	NA	0.25	1	0.25
	Habitat degradation						
	Energy resource reduction	NA			x		
	Air quality impairment (chronic levels)	NA			--		
	Water quality impairment (chronic levels)	NA			x		
	Sediment quality impairment (chronic levels)	NA			x		
	Reduction of structural habitat quality metrics	NA			x		
	Assigned Effect Index Value	NA	1	NA	0.5	1	0.50

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Average Direct Effects	NA		NA	0.25		0.25
	Average Effects Index	NA		NA	0.31		0.31
	Magnitude of Effects	**NA**		**NA**	**0.31**		**0.31**

MARINE MAMMAL

Southern resident orca

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index	Effects Index	Net Conservation Measure Index	Adjusted Effects Index
All	**Direct Effect**						
	Species level						
	Increased activity	--			x		
	Impair behavior/timing patterns	--			x		
	Physical harm or harassment	--			--		
	Assigned Effect Index Value	0	1	0.00	0.25	1	0.25
	Habitat level						
	Air quality impairment (acute levels)	--			--		
	Water impairment (acute levels)	--			--		
	Sediment quality impairment (acute levels)	--			--		
	Permanent habitat destruction/displacement	--			x		
	Permanently inaccessible habitat	--			--		
	Assigned Effect Index Value	0	1	0.00	0.25	1	0.25
	Indirect Effect						
	Habitat loss						

	Effects and Pathways	Shellfish			Finfish		
		Effects Index	**Net Conservation Measure Index**	**Adjusted Effects Index**	**Effects Index**	**Net Conservation Measure Index**	**Adjusted Effects Index**
	Temporary destruction/displacement	--			x		
	Temporarily inaccessible	--			x		
	Assigned Effect Index Value	0	1	0.00	0.25	1	0.25
	Habitat degradation						
	Energy resource reduction	--			x		
	Air quality impairment (chronic levels)	--			--		
	Water quality impairment (chronic levels)	--			--		
	Sediment quality impairment (chronic levels)	--			--		
	Reduction of structural habitat quality metrics	--			x		
	Assigned Effect Index Value	0	1	0.00	0.25	1	0.25
	Average Direct Effects	0.00		0.00	0.25		0.25
	Average Effects Index	0.00		0.00	0.25		0.25
	Magnitude of Effects	**0.00**		**0.00**	**0.25**		**0.25**

Log booming and storage

AMPHIBIANS AND REPTILE

Columbia Spotted Frog and Northern Leopard Frog, Western Toad

	Effects and Pathways	Log Booming and Storage[3]		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Adult	**Direct Effect**			
	Species level			
	Increased activity	--		
	Impair behavior/timing patterns	--		
	Physical harm or harassment	x		
	Assigned Effect Index Value[4]	0.25	1	0.25
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	--		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	--		
	Permanently inaccessible habitat	--		
	Assigned Effect Index Value	0	0.75	0.00
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	--		
	Temporarily inaccessible	--		
	Assigned Effect Index Value	0	0.75	0.00

[3] x = Sources of effect,; = Absence of effect; NA = Absence of interaction

[4] Ranks: Effects Index and Adjusted Effects Index r values: 1= total loss; 0.75 = high effect; 0.5 = moderate effect; 0.25 = low effect; 0 = trace effect Net Conservation Measure Index ranks: 1= No effectiveness; 0.75 = low effectiveness; 0.5 = moderate effectiveness; 0.25 = high effectiveness; 0 = Total effectiveness

	Effects and Pathways	Log Booming and Storage[3]		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Habitat degradation			
	Energy resource reduction	--		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	x		
	Sediment quality impairment (chronic levels)	x		
	Reduction of structural habitat quality metrics	x		
	Assigned Effect Index Value	0.25	0.5	0.13
	Average Direct Effects	0.13		0.13
	Average Effects Index	0.13		0.09
	Magnitude of Effects	**0.13**		**0.13**
Tadpole	**Direct Effect**			
	Species level			
	Increased activity	--		
	Impair behavior/timing patterns	--		
	Physical harm or harassment	x		
	Assigned Effect Index Value	0	1	0.00
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	--		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	--		
	Permanently inaccessible habitat	--		
	Assigned Effect Index Value	0	0.75	0.00
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	--		
	Temporarily inaccessible	--		
	Assigned Effect Index Value	0	0.75	0.00

	Effects and Pathways	Log Booming and Storage[3]		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Habitat degradation			
	Energy resource reduction	--		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	x		
	Sediment quality impairment (chronic levels)	--		
	Reduction of structural habitat quality metrics	x		
	Assigned Effect Index Value	0.25	0.5	0.13
	Average Direct Effects	0.00		0.00
	Average Effects Index	0.06		0.03
	Magnitude of Effects	**0.06**		**0.03**
Egg	**Direct Effect**			
	Species level			
	Increased activity	--		
	Impair behavior/timing patterns	--		
	Physical harm or harassment	x		
	Assigned Effect Index Value	0	1	0.00
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	--		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	--		
	Permanently inaccessible habitat	--		
	Assigned Effect Index Value	0	0.75	0.00
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	--		
	Temporarily inaccessible	--		
	Assigned Effect Index Value	0	0.75	0.00
	Habitat degradation			

	Effects and Pathways	Log Booming and Storage[3] Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Energy resource reduction	--		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	x		
	Sediment quality impairment (chronic levels)	--		
	Reduction of structural habitat quality metrics	x		
	Assigned Effect Index Value	0.25	0.5	0.13
	Average Direct Effects	0.00		0.00
	Average Effects Index	0.06		0.03
	Magnitude of Effects	**0.06**		**0.03**

Western Pond Turtle

	Effects and Pathways	Log Booming and Storage Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Foraging, Migratory	*Species level*			
	Increased activity	--		
	Impair behavior/timing patterns	--		
	Physical harm or harassment	x		
	Assigned Effect Index Value	0	1	0.00
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	--		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	x		
	Permanently inaccessible habitat	x		
	Assigned Effect Index Value	0.25	0.75	0.19
	Indirect Effect			

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Habitat loss			
	Temporary destruction/displacement	--		
	Temporarily inaccessible	x		
	Assigned Effect Index Value	0	0.75	0.00
	Habitat degradation			
	Energy resource reduction	x		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	x		
	Sediment quality impairment (chronic levels)	--		
	Reduction of structural habitat quality metrics	--		
	Assigned Effect Index Value	0	0.5	0.00
	Average Direct Effects	0.13		0.09
	Average Effects Index	0.06		0.05
	Magnitude of Effects	**0.13**		**0.09**
Overwintering	**Direct Effects**			
	Species level			
	Increased activity	--		
	Impair behavior/timing patterns	--		
	Physical harm or harassment	x		
	Assigned Effect Index Value	0	1	0.00
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	--		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	--		
	Permanently inaccessible habitat	--		
	Assigned Effect Index Value	0	0.75	0.00
	Indirect Effect			

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Habitat loss			
	Temporary destruction/displacement	--		
	Temporarily inaccessible	--		
	Assigned Effect Index Value	0	0.75	0.00
	Habitat degradation			
	Energy resource reduction	--		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	--		
	Sediment quality impairment (chronic levels)	--		
	Reduction of structural habitat quality metrics	--		
	Assigned Effect Index Value	0	0.5	0.00
	Average Direct Effects	0.00		0.00
	Average Effects Index	0.00		0.00
	Magnitude of Effects	**0.00**		**0.00**

BIRDS

Bald eagle

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Non-nesting	**Direct Effect**			
	Species level			
	Increased activity	--		
	Impair behavior/timing patterns	x		
	Physical harm or harassment	x		
	Assigned Effect Index Value	0.25	0.75	0.19
	Habitat level			

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	--		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	x		
	Permanently inaccessible habitat	--		
	Assigned Effect Index Value	0	0.75	0.00
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	--		
	Temporarily inaccessible	x		
	Assigned Effect Index Value	0.25	1	0.25
	Habitat degradation			
	Energy resource reduction	x		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	--		
	Sediment quality impairment (chronic levels)	--		
	Reduction of structural habitat quality metrics	x		
	Assigned Effect Index Value	0.25	0.75	0.19
	Average Direct Effects	0.13		0.09
	Average Effects Index	0.19		0.16
	Magnitude of Effects	**0.19**		**0.16**
Nesting	**Direct Effect**			
	Species level			
	Increased activity	x		
	Impair behavior/timing patterns	--		
	Physical harm or harassment	x		
	Assigned Effect Index Value	0.75	0.75	0.56
	Habitat level			

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	--		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	x		
	Permanently inaccessible habitat	x		
	Assigned Effect Index Value	0.75	0.75	0.56
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	--		
	Temporarily inaccessible	x		
	Assigned Effect Index Value	0.5	1	0.50
	Habitat degradation			
	Energy resource reduction	x		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	--		
	Sediment quality impairment (chronic levels)	--		
	Reduction of structural habitat quality metrics	x		
	Assigned Effect Index Value	0.25	0.75	0.19
	Average Direct Effects	0.75		0.56
	Average Effects Index	0.56		0.45
	Magnitude of Effects	**0.75**		**0.56**

Black tern

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Migration	**Direct Effect**			
	Species level			
	Increased activity	--		

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Impair behavior/timing patterns	x		
	Physical harm or harassment	--		
	Assigned Effect Index Value	0	0.75	0.00
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	--		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	--		
	Permanently inaccessible habitat	--		
	Assigned Effect Index Value	0	0.75	0.00
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	--		
	Temporarily inaccessible	--		
	Assigned Effect Index Value	0	1	0.00
	Habitat degradation			
	Energy resource reduction	x		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	--		
	Sediment quality impairment (chronic levels)	--		
	Reduction of structural habitat quality metrics	x		
	Assigned Effect Index Value	0	0.75	0.00
	Average Direct Effects	0.00		0.00
	Average Effects Index	0.00		0.00
	Magnitude of Effects	**0.00**		**0.00**
Nesting	*Species level*			
	Increased activity	NA		
	Impair behavior/timing patterns	NA		

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Physical harm or harassment	NA		
	Assigned Effect Index Value	NA	0.75	NA
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	--		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	0	0.5	0.00
	Permanently inaccessible habitat			
	Assigned Effect Index Value	--		
	Indirect Effect	--		
	Habitat loss	--		
	Temporary destruction/displacement	--		
	Temporarily inaccessible	--		
	Assigned Effect Index Value	0	0.5	0.00
	Habitat degradation			
	Energy resource reduction			
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	--		
	Sediment quality impairment (chronic levels)	0	1	0.00
	Reduction of structural habitat quality metrics			
	Assigned Effect Index Value	x		
	Average Direct Effects	--		
	Average Effects Index	--		
	Magnitude of Effects	--		

Brown pelican

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Resident / Non-nesting	*Species level*			
	Increased activity	--		
	Impair behavior/timing patterns	x		
	Physical harm or harassment	x		
	Assigned Effect Index Value	0.25	0.75	0.19
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	--		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	x		
	Permanently inaccessible habitat	x		
	Assigned Effect Index Value	0.5	0.75	0.38
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	--		
	Temporarily inaccessible	x		
	Assigned Effect Index Value	0	1	0.00
	Habitat degradation			
	Energy resource reduction	x		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	x		
	Sediment quality impairment (chronic levels)	--		
	Reduction of structural habitat quality metrics	x		
	Assigned Effect Index Value	0.5	0.75	0.38
	Average Direct Effects	0.38		0.28
	Average Effects Index	0.31		0.23
	Magnitude of Effects	**0.38**		**0.28**

Common loon

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Non-nesting	**Direct Effect**			
	Species level			
	Increased activity	--		
	Impair behavior/timing patterns	x		
	Physical harm or harassment	x		
	Assigned Effect Index Value	0.25	0.75	0.19
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	--		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	x		
	Permanently inaccessible habitat	--		
	Assigned Effect Index Value	0.5	0.75	0.38
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	--		
	Temporarily inaccessible	x		
	Assigned Effect Index Value	0	1	0.00
	Habitat degradation			
	Energy resource reduction	x		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	x		
	Sediment quality impairment (chronic levels)	--		
	Reduction of structural habitat quality metrics	x		
	Assigned Effect Index Value	0.25	0.75	0.19

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Average Direct Effects	0.38		0.28
	Average Effects Index	0.25		0.19
	Magnitude of Effects	**0.38**		**0.28**
Nesting	**Direct Effect**			
	Species level			
	Increased activity	--		
	Impair behavior/timing patterns	x		
	Physical harm or harassment	--		
	Assigned Effect Index Value	1	0.5	0.50
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	--		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	x		
	Permanently inaccessible habitat	x		
	Assigned Effect Index Value	1	0.5	0.50
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	--		
	Temporarily inaccessible	--		
	Assigned Effect Index Value	0	1	0.00
	Habitat degradation			
	Energy resource reduction	x		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	--		
	Sediment quality impairment (chronic levels)	--		
	Reduction of structural habitat quality metrics	x		
	Assigned Effect Index Value	0.25	0.75	0.19

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Average Direct Effects	1.00		0.50
	Average Effects Index	0.56		0.30
	Magnitude of Effects	**1.00**		**0.50**

Harlequin duck

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Non-nesting	**Direct Effect**			
	Species level			
	Increased activity	--		
	Impair behavior/timing patterns	x		
	Physical harm or harassment	x		
	Assigned Effect Index Value	0.25	0.75	0.19
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	--		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	x		
	Permanently inaccessible habitat	--		
	Assigned Effect Index Value	0.5	0.75	0.38
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	--		
	Temporarily inaccessible	x		
	Assigned Effect Index Value	0	1	0.00
	Habitat degradation			
	Energy resource reduction	x		
	Air quality impairment (chronic levels)	--		

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Water quality impairment (chronic levels)	x		
	Sediment quality impairment (chronic levels)	x		
	Reduction of structural habitat quality metrics	x		
	Assigned Effect Index Value	0.25	0.75	0.19
	Average Direct Effects	0.38		0.28
	Average Effects Index	0.25		0.19
	Magnitude of Effects	**0.38**		**0.28**
Nesting	**Direct Effect**			
	Species level			
	Increased activity	NA		
	Impair behavior/timing patterns	NA		
	Physical harm or harassment	NA		
	Assigned Effect Index Value	NA	0.5	NA
	Habitat level			
	Air quality impairment (acute levels)	NA		
	Water impairment (acute levels)	NA		
	Sediment quality impairment (acute levels)	NA		
	Permanent habitat destruction/displacement	NA		
	Permanently inaccessible habitat	NA		
	Assigned Effect Index Value	NA	0.5	NA
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	NA		
	Temporarily inaccessible	NA		
	Assigned Effect Index Value	NA	1	NA
	Habitat degradation			
	Energy resource reduction	NA		
	Air quality impairment (chronic levels)	NA		

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Water quality impairment (chronic levels)	NA		
	Sediment quality impairment (chronic levels)	NA		
	Reduction of structural habitat quality metrics	NA		
	Assigned Effect Index Value	NA	0.75	NA
	Average Direct Effects	NA		NA
	Average Effects Index	NA		NA
	Magnitude of Effects	**NA**		**NA**

Marbled murrelet

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Non-nesting	**Direct Effect**			
	Species level			
	Increased activity	--		
	Impair behavior/timing patterns	x		
	Physical harm or harassment	x		
	Assigned Effect Index Value	0.25	0.75	0.19
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	--		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	x		
	Permanently inaccessible habitat	--		
	Assigned Effect Index Value	0.5	0.75	0.38
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	--		
	Temporarily inaccessible	x		

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Assigned Effect Index Value	0	1	0.00
	Habitat degradation			
	Energy resource reduction	x		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	x		
	Sediment quality impairment (chronic levels)	x		
	Reduction of structural habitat quality metrics	x		
	Assigned Effect Index Value	0.25	0.75	0.19
	Average Direct Effects	0.38		0.28
	Average Effects Index	0.25		0.19
	Magnitude of Effects	**0.38**		**0.28**
Nesting	**Direct Effect**			
	Species level			
	Increased activity	--		
	Impair behavior/timing patterns	x		
	Physical harm or harassment	--		
	Assigned Effect Index Value	1	0.5	0.50
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	--		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	x		
	Permanently inaccessible habitat	x		
	Assigned Effect Index Value	0.5	0.5	0.25
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	--		
	Temporarily inaccessible	--		

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Assigned Effect Index Value	0	1	0.00
	Habitat degradation			
	Energy resource reduction	x		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	--		
	Sediment quality impairment (chronic levels)	--		
	Reduction of structural habitat quality metrics	x		
	Assigned Effect Index Value	0.25	0.75	0.19
	Average Direct Effects	0.75		0.38
	Average Effects Index	0.44		0.23
	Magnitude of Effects	**0.75**		**0.38**

Western snowy plover

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Wintering	**Direct Effect**			
	Species level			
	Increased activity	NA		
	Impair behavior/timing patterns	NA		
	Physical harm or harassment	NA		
	Assigned Effect Index Value	NA	0.75	NA
	Habitat level			
	Air quality impairment (acute levels)	NA		
	Water impairment (acute levels)	NA		
	Sediment quality impairment (acute levels)	NA		
	Permanent habitat destruction/displacement	NA		

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Permanently inaccessible habitat	NA		
	Assigned Effect Index Value	NA	0.75	NA
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	NA		
	Temporarily inaccessible	NA		
	Assigned Effect Index Value	NA	1	NA
	Habitat degradation			
	Energy resource reduction	NA		
	Air quality impairment (chronic levels)	NA		
	Water quality impairment (chronic levels)	NA		
	Sediment quality impairment (chronic levels)	NA		
	Reduction of structural habitat quality metrics	NA		
	Assigned Effect Index Value	NA	0.75	NA
	Average Direct Effects	NA		NA
	Average Effects Index	NA		NA
	Magnitude of Effects	**NA**		**NA**
Nesting	**Direct Effect**			
	Species level			
	Increased activity	NA		
	Impair behavior/timing patterns	NA		
	Physical harm or harassment	NA		
	Assigned Effect Index Value	NA	0.5	NA
	Habitat level			
	Air quality impairment (acute levels)	NA		
	Water impairment (acute levels)	NA		
	Sediment quality impairment (acute levels)	NA		

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Permanent habitat destruction/displacement	NA		
	Permanently inaccessible habitat	NA		
	Assigned Effect Index Value	NA	0.5	NA
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	NA		
	Temporarily inaccessible	NA		
	Assigned Effect Index Value	NA	1	NA
	Habitat degradation			
	Energy resource reduction	NA		
	Air quality impairment (chronic levels)	NA		
	Water quality impairment (chronic levels)	NA		
	Sediment quality impairment (chronic levels)	NA		
	Reduction of structural habitat quality metrics	NA		
	Assigned Effect Index Value	NA	0.75	NA
	Average Direct Effects	NA		NA
	Average Effects Index	NA		NA
	Magnitude of Effects	**NA**		**NA**

FISH

Pacific salmon, trout and char

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Adult	**Direct Effect**			
	Species level			
	Increased activity	--		
	Impair behavior/timing patterns	x		
	Physical harm or harassment	--		
	Assigned Effect Index Value	0	1	0.00
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	--		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	x		
	Permanently inaccessible habitat	x		
	Assigned Effect Index Value	0.5	0.75	0.38
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	--		
	Temporarily inaccessible	x		
	Assigned Effect Index Value	0.25	0.75	0.19
	Habitat degradation			
	Energy resource reduction	x		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	x		
	Sediment quality impairment (chronic levels)	x		
	Reduction of structural habitat quality metrics	x		

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Assigned Effect Index Value	0.25	0.75	0.19
	Average Direct Effects	0.25		0.19
	Average Effects Index	0.25		0.19
	Magnitude of Effects	**0.25**		**0.19**
Incubation / Emergence	**Direct Effect**			
	Species level			
	Increased activity	--		
	Impair behavior/timing patterns	--		
	Physical harm or harassment	x		
	Assigned Effect Index Value	0.5	1	0.50
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	x		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	x		
	Permanently inaccessible habitat	x		
	Assigned Effect Index Value	1	1	1.00
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	--		
	Temporarily inaccessible	--		
	Assigned Effect Index Value	0	1	0.00
	Habitat degradation			
	Energy resource reduction	--		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	x		
	Sediment quality impairment (chronic levels)	x		
	Reduction of structural habitat quality metrics	--		

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Assigned Effect Index Value	1	1	1.00
	Average Direct Effects	0.75		0.75
	Average Effects Index	0.63		0.63
	Magnitude of Effects	**0.75**		**0.75**
Freshwater Rearing / Outmigration	**Direct Effect**			
	Species level			
	Increased activity	--		
	Impair behavior/timing patterns	x		
	Physical harm or harassment	x		
	Assigned Effect Index Value	0.25	1	0.25
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	x		
	Sediment quality impairment (acute levels)	x		
	Permanent habitat destruction/displacement	--		
	Permanently inaccessible habitat	x		
	Assigned Effect Index Value	0.5	0.75	0.38
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	--		
	Temporarily inaccessible	x		
	Assigned Effect Index Value	0.5	0.75	0.38
	Habitat degradation			
	Energy resource reduction	x		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	x		
	Sediment quality impairment (chronic levels)	x		
	Reduction of structural habitat quality metrics	x		

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Assigned Effect Index Value	0.5	0.75	0.38
	Average Direct Effects	0.38		0.31
	Average Effects Index	0.44		0.34
	Magnitude of Effects	**0.44**		**0.34**

Green sturgeon

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Adult	**Direct Effect**			
	Species level			
	Increased activity	--		
	Impair behavior/timing patterns	--		
	Physical harm or harassment	x		
	Assigned Effect Index Value	0	1	0.00
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	--		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	x		
	Permanently inaccessible habitat	x		
	Assigned Effect Index Value	0.5	0.75	0.38
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	x		
	Temporarily inaccessible	x		
	Assigned Effect Index Value	0.25	0.75	0.19
	Habitat degradation			
	Energy resource reduction	x		

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	x		
	Sediment quality impairment (chronic levels)	x		
	Reduction of structural habitat quality metrics	x		
	Assigned Effect Index Value	0.5	0.75	0.38
	Average Direct Effects	0.25		0.19
	Average Effects Index	0.31		0.23
	Magnitude of Effects	**0.31**		**0.23**

White sturgeon

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
Adult	**Direct Effect**			
	Species level			
	Increased activity	--		
	Impair behavior/timing patterns	x		
	Physical harm or harassment	x		
	Assigned Effect Index Value	0.25	1	0.25
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	x		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	x		
	Permanently inaccessible habitat	x		
	Assigned Effect Index Value	0.5	0.75	0.38
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	x		

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Temporarily inaccessible	x		
	Assigned Effect Index Value	0.25	0.75	0.19
	Habitat degradation			
	Energy resource reduction	x		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	x		
	Sediment quality impairment (chronic levels)	x		
	Reduction of structural habitat quality metrics	x		
	Assigned Effect Index Value	0.5	0.75	0.38
	Average Direct Effects	0.38		0.31
	Average Effects Index	0.38		0.30
	Magnitude of Effects	**0.38**		**0.31**
Larvae	**Direct Effect**			
	Species level			
	Increased activity	--		
	Impair behavior/timing patterns	x		
	Physical harm or harassment	x		
	Assigned Effect Index Value	0.5	1	0.50
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	x		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	x		
	Permanently inaccessible habitat	x		
	Assigned Effect Index Value	0.75	0.75	0.56
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	x		

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Temporarily inaccessible	x		
	Assigned Effect Index Value	0.5	0.75	0.38
	Habitat degradation			
	Energy resource reduction	x		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	x		
	Sediment quality impairment (chronic levels)	x		
	Reduction of structural habitat quality metrics	x		
	Assigned Effect Index Value	0.5	0.75	0.38
	Average Direct Effects	0.63		0.53
	Average Effects Index	0.56		0.45
	Magnitude of Effects	**0.63**		**0.53**
Egg / Incubation	**Direct Effect**			
	Species level			
	Increased activity	--		
	Impair behavior/timing patterns	x		
	Physical harm or harassment	x		
	Assigned Effect Index Value	0.5	1	0.50
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	x		
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	x		
	Permanently inaccessible habitat	x		
	Assigned Effect Index Value	1	1	1.00
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	x		
	Temporarily inaccessible	x		

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Assigned Effect Index Value	0.5	1	0.50
	Habitat degradation			
	Energy resource reduction	x		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	x		
	Sediment quality impairment (chronic levels)	x		
	Reduction of structural habitat quality metrics	x		
	Assigned Effect Index Value	0.5	1	0.50
	Average Direct Effects	0.75		0.75
	Average Effects Index	0.63		0.63
	Magnitude of Effects	**0.75**		**0.75**

MARINE MAMMAL

Southern resident orca

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
All	**Direct Effect**			
	Species level			
	Increased activity	--		
	Impair behavior/timing patterns	--		
	Physical harm or harassment	--		
	Assigned Effect Index Value	0	1	0.00
	Habitat level			
	Air quality impairment (acute levels)	--		
	Water impairment (acute levels)	--		

	Effects and Pathways	Log Booming and Storage		
		Effects Index	Net Conservation Measure Index	Adjusted Effects Index
	Sediment quality impairment (acute levels)	--		
	Permanent habitat destruction/displacement	x		
	Permanently inaccessible habitat	x		
	Assigned Effect Index Value	0.25	1	0.25
	Indirect Effect			
	Habitat loss			
	Temporary destruction/displacement	--		
	Temporarily inaccessible	--		
	Assigned Effect Index Value	0	1	0.00
	Habitat degradation			
	Energy resource reduction	x		
	Air quality impairment (chronic levels)	--		
	Water quality impairment (chronic levels)	--		
	Sediment quality impairment (chronic levels)	--		
	Reduction of structural habitat quality metrics	x		
	Assigned Effect Index Value	0	1	0.00
	Average Direct Effects	0.13		0.13
	Average Effects Index	0.06		0.06
	Magnitude of Effects	**0.13**		**0.13**

Overwater structures

AMPHIBIANS AND REPTILE

Columbia Spotted Frog and Northern Leopard Frog, Western Toad

		Single Element Structures																		Multiple Element Structures					
		Docks and Wharves[5]			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
	Effects and Pathways	EI[6]	NCMI[7]	AEI[8]	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
Adult	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			--			--			--			x			x		
	Impair behavior/timing patterns	x			x			x			--			--			x			x			x		
	Physical harm or harassment	x			x			--			--			--			x			x			x		
	Assigned Effect Index Value[9]	0.75	1	0.75	0.75	1	0.75	0.5	1	0.50	0	1	0.00	0	1	0.00	0.25	1	0.25	0.25	0.75	0.19	0.25	0.75	0.19
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Water impairment (acute levels)	--			--			--			--			--			--			--			--		
	Sediment quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Permanent habitat destruction/displacement	x			x			x			x			x			x			x			x		
	Permanently inaccessible habitat	x			x			x			--			--			x			x			x		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.75	0.75	0.56	0	0.75	0.00	0	0.75	0.00	0.75	0.75	0.56	0.25	1	0.25	0.25	1	0.25

[5] x = Sources of effect,; = Absence of effect; NA = Absence of interaction
[6] Effects Index
[7] Net Conservation Measure Index
[8] Adjusted Effects Index
[9] Ranks: Effects Index and Adjusted Effects Index r values: 1= total loss; 0.75 = high effect; 0.5 = moderate effect; 0.25 = low effect; 0 = trace effect Net Conservation Measure Index ranks: 1= No effectiveness; 0.75 = low effectiveness; 0.5 = moderate effectiveness; 0.25 = high effectiveness; 0 = Total effectiveness

		Single Element Structures																		Multiple Element Structures					
		Docks and Wharves[5]			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
	Effects and Pathways	**EI[6]**	**NCMI[7]**	**AEI[8]**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**
	Indirect Effect																								
	Habitat loss																								
	Temporary destruction/displacement	x			x			x			x			x			x			--			--		
	Temporarily inaccessible	x			x			x			x			x			x			--			--		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.75	0.75	0.56	0	0.75	0.00	0	0.75	0.00	0.75	0.75	0.56	0	1	0.00	0	1	0.00
	Habitat degradation																								
	Energy resource reduction	x			x			x			x			x			x			x			x		
	Air quality impairment (chronic levels)	--			--			--			--			--			--			--			--		
	Water quality impairment (chronic levels)	x			--			x			--			--			--			x			x		
	Sediment quality impairment (chronic levels)	x			--			x			--			--			--			--			--		
	Reduction of structural habitat quality metrics	x			x			--			x			x			x			x			x		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.75	0.75	0.56	0	0.75	0.00	0	0.75	0.00	0.75	0.75	0.56	0.25	0.75	0.19	0.25	0.75	0.19
	Average Direct Effects	0.75		0.66	0.75		0.66	0.63		0.53	0.00		0.00	0.00		0.00	0.50		0.41	0.25		0.22	0.25		0.22
	Average Effects Index	0.75		0.61	0.75		0.61	0.69		0.55	0.00		0.00	0.00		0.00	0.63		0.48	0.19		0.16	0.19		0.16
	Magnitude of Effects	**0.75**		**0.66**	**0.75**		**0.66**	**0.69**		**0.55**	**0.00**		**0.00**	**0.00**		**0.00**	**0.63**		**0.48**	**0.25**		**0.22**	**0.25**		**0.22**
Tadpole	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			--			--			--			x			x		
	Impair behavior/timing patterns	x			x			x			--			--			--			x			x		
	Physical harm or harassment	x			x			--			--			--			--			x			x		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.5	0.75	0.38	0	0.75	0.00	0	0.75	0.00	0	0.75	0.00	0.25	0.75	0.19	0.25	0.75	0.19
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Water impairment (acute levels)	--			--			--			--			--			--			--			--		
	Sediment quality impairment (acute levels)	--			--			--			--			--			--			--			--		

		Single Element Structures																		Multiple Element Structures					
		Docks and Wharves[5]			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
	Effects and Pathways	**EI[6]**	**NCMI[7]**	**AEI[8]**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**
	Permanent habitat destruction/displacement	x			x			x			--			--			--			x			x		
	Permanently inaccessible habitat	x			x			x			--			--			--			--			--		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.75	0.75	0.56	0	0.75	0.00	0	0.75	0.00	0	0.75	0.00	0	1	0.00	0	1	0.00
	Indirect Effect																								
	Habitat loss																								
	Temporary destruction/displacement	x			x			x			--			--			--			--			--		
	Temporarily inaccessible	x			x			x			--			--			--			--			--		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.75	0.75	0.56	0	0.75	0.00	0	0.75	0.00	0	0.75	0.00	0	0.75	0.00	0	0.75	0.00
	Habitat degradation																								
	Energy resource reduction	x			x			--			--			--			--			x			x		
	Air quality impairment (chronic levels)	--			--			--			--			--			--			--			--		
	Water quality impairment (chronic levels)	--			--			x			--			--			--			x			x		
	Sediment quality impairment (chronic levels)	--			--			x			--			--			--			--			--		
	Reduction of structural habitat quality metrics	x			x			--			--			--			--			x			x		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.75	0.75	0.56	0	0.75	0.00	0	0.75	0.00	0	0.75	0.00	0.25	0.75	0.19	0.25	0.75	0.19
	Average Direct Effects	0.75		0.56	0.75		0.56	0.63		0.47	0.00		0.00	0.00		0.00	0.00		0.00	0.13		0.09	0.13		0.09
	Average Effects Index	0.75		0.56	0.75		0.56	0.69		0.52	0.00		0.00	0.00		0.00	0.00		0.00	0.13		0.09	0.13		0.09
	Magnitude of Effects	**0.75**		**0.56**	**0.75**		**0.56**	**0.69**		**0.52**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.13**		**0.09**	**0.13**		**0.09**
Egg	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			--			--			--			--			--		
	Impair behavior/timing patterns	x			x			x			--			--			--			--			--		
	Physical harm or harassment	x			x			--			--			--			--			--			--		
	Assigned Effect Index Value	0.75	1	0.75	0.75	1	0.75	0.5	1	0.50	0	1	0.00	0	1	0.00	0	1	0.00	0	0.75	0.00	0	0.75	0.00
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		

	Single Element Structures																		Multiple Element Structures					
	Docks and Wharves[5]			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
Effects and Pathways	**EI[6]**	**NCMI[7]**	**AEI[8]**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**
Water impairment (acute levels)	--			--			--			--			--			--			--			--		
Sediment quality impairment (acute levels)	--			--			--			--			--			--			--			--		
Permanent habitat destruction/displacement	x			x			x			--			--			--			x			x		
Permanently inaccessible habitat	x			x			x			--			--			--			--			--		
Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.75	0.75	0.56	0	0.75	0.00	0	0.75	0.00	0	0.75	0.00	0	1	0.00	0	1	0.00
Indirect Effect																								
Habitat loss																								
Temporary destruction/displacement	x			x			x			--			--			--			--			--		
Temporarily inaccessible	x			x			x			--			--			--			--			--		
Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.75	0.75	0.56	0	0.75	0.00	0	0.75	0.00	0	0.75	0.00	0	0.75	0.00	0	0.75	0.00
Habitat degradation																								
Energy resource reduction	x			x			--			--			--			--			x			x		
Air quality impairment (chronic levels)	--			--			--			--			--			--			--			--		
Water quality impairment (chronic levels)	--			--			x			--			--			--			--			--		
Sediment quality impairment (chronic levels)	--			--			x			--			--			--			--			--		
Reduction of structural habitat quality metrics	x			x			--			--			--			--			x			x		
Assigned Effect Index Value	0.75	0.75	0.56	0.75	1	0.75	0.75	1	0.75	0	1	0.00	0	1	0.00	0	1	0.00	0.25	0.75	0.19	0.25	0.75	0.19
Average Direct Effects	0.75		0.66	0.75		0.66	0.63		0.53	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00
Average Effects Index	0.75		0.61	0.75		0.66	0.69		0.59	0.00		0.00	0.00		0.00	0.00		0.00	0.06		0.05	0.06		0.05
Magnitude of Effects	**0.75**		**0.66**	**0.75**		**0.66**	**0.69**		**0.59**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.06**		**0.05**	**0.06**		**0.05**

Western Pond Turtle

		Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
	Effects and Pathways	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**
Foraging, Migratory	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			--			--			--			--			--		
	Impair behavior/timing patterns	x			x			x			--			--			x			--			--		
	Physical harm or harassment	x			x			--			--			--			x			--			--		
	Assigned Effect Index Value	0.75	1	0.75	0.75	1	0.75	0.5	1	0.50	0	1	0.00	0	1	0.00	0.25	1	0.25	0	0.75	0.00	0	0.75	0.00
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Water impairment (acute levels)	--			--			--			--			--			--			--			--		
	Sediment quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Permanent habitat destruction/displacement	x			x			x			x			x			x			x			x		
	Permanently inaccessible habitat	x			x			x			--			--			x			--			--		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.75	0.75	0.56	0	0.75	0.00	0	0.75	0.00	0.75	0.75	0.56	0.25	1	0.25	0.25	1	0.25
	Indirect Effect																								
	Habitat loss																								
	Temporary destruction/displacement	x			x			x			x			x			x			--			--		
	Temporarily inaccessible	x			x			x			x			x			x			--			--		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.75	0.75	0.56	0	0.75	0.00	0	0.75	0.00	0.75	0.75	0.56	0	1	0.00	0	1	0.00
	Habitat degradation																								
	Energy resource reduction	x			x			x			x			x			x								
	Air quality impairment (chronic levels)	--			--			--			--			--			--			--			--		
	Water quality impairment (chronic levels)	--			--			x			--			--			--			x			x		
	Sediment quality impairment (chronic levels)	--			--			x			--			--			--			x			x		
	Reduction of structural habitat quality metrics	x			x			--			x			x			x			x			x		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.75	0.75	0.56	0	0.75	0.00	0	0.75	0.00	0.75	0.75	0.56	0.25	0.75	0.19	0.25	0.75	0.19

	Effects and Pathways	Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
		EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
	Average Direct Effects	0.75		0.66	0.75		0.66	0.63		0.53	0.00		0.00	0.00		0.00	0.50		0.41	0.13		0.13	0.13		0.13
	Average Effects Index	0.75		0.61	0.75		0.61	0.69		0.55	0.00		0.00	0.00		0.00	0.63		0.48	0.13		0.11	0.13		0.11
	Magnitude of Effects	**0.75**		**0.66**	**0.75**		**0.66**	**0.69**		**0.55**	**0.00**		**0.00**	**0.00**		**0.00**	**0.63**		**0.48**	**0.13**		**0.13**	**0.13**		**0.13**
Overwintering	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			--			--			--			--			--		
	Impair behavior/timing patterns	x			x			x			--			--			x			--			--		
	Physical harm or harassment	x			x			--			--			--			x			--			--		
	Assigned Effect Index Value	0.75	1	0.75	0.75	1	0.75	0.5	1	0.50	0	1	0.00	0	1	0.00	0.25	1	0.25	0	1	0.00	0	1	0.00
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Water impairment (acute levels)	--			--			--			--			--			--			--			--		
	Sediment quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Permanent habitat destruction/displacement	x			x			x			x			x			x			--			--		
	Permanently inaccessible habitat	x			x			x			--			--			x			--			--		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.75	0.75	0.56	0	0.75	0.00	0	0.75	0.00	0.75	0.75	0.56	0	1	0.00	0	1	0.00
	Indirect Effect																								
	Habitat loss																								
	Temporary destruction/displacement	x			x			x			x			x			x			--			--		
	Temporarily inaccessible	x			x			x			x			x			x			--			--		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.75	0.75	0.56	0	0.75	0.00	0	0.75	0.00	0.75	0.75	0.56	0	1	0.00	0	1	0.00
	Habitat degradation																								
	Energy resource reduction	x			x			x			x			x			x								
	Air quality impairment (chronic levels)	--			--			--			--			--			--			--			--		
	Water quality impairment (chronic levels)	--			--			x			--			--			--			--			--		

	Effects and Pathways	Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
		EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
	Sediment quality impairment (chronic levels)	--			--			x			--			--			--			--			--		
	Reduction of structural habitat quality metrics	x			x			--			x			x			x			--			--		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.75	0.75	0.56	0	0.75	0.00	0	0.75	0.00	0.75	0.75	0.56	0	1	0.00	0	1	0.00
	Average Direct Effects	0.75		0.66	0.75		0.66	0.63		0.53	0.00		0.00	0.00		0.00	0.50		0.41	0.00		0.00	0.00		0.00
	Average Effects Index	0.75		0.61	0.75		0.61	0.69		0.55	0.00		0.00	0.00		0.00	0.63		0.48	0.00		0.00	0.00		0.00
	Magnitude of Effects	**0.75**		**0.66**	**0.75**		**0.66**	**0.69**		**0.55**	**0.00**		**0.00**	**0.00**		**0.00**	**0.63**		**0.48**	**0.00**		**0.00**	**0.00**		**0.00**

BIRDS

Bald eagle

	Effects and Pathways	Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
		EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
Non-nesting	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			x			x			x			x			x		
	Impair behavior/timing patterns	x			x			x			x			x			x			x			x		
	Physical harm or harassment	--			--			--			--			--			--			--			--		
	Assigned Effect Index Value	0.3	1	0.25	0.3	1	0.25	0.3	1	0.25	0	1	0.00	0	1	0.00	0.3	1	0.25	0.5	0.75	0.38	0.5	0.75	0.38
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Water impairment (acute levels)	--			--			--			--			--			--			--			--		
	Sediment quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Permanent habitat destruction/displacement	x			x			x			x			x			x			x			x		

		Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
	Effects and Pathways	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**
	Permanently inaccessible habitat	--			--			--			--			--			--			--			--		
	Assigned Effect Index Value	0.3	0.75	0.19	0.3	0.75	0.19	0.3	0.75	0.19	0	0.75	0.00	0	0.75	0.00	0.3	0.75	0.19	0.3	0.75	0.19	0.3	0.75	0.19
	Indirect Effect																								
	Habitat loss																								
	Temporary destruction/displacement	x			x			x			x			x			x			--			--		
	Temporarily inaccessible	x			x			x			x			x			x			x			x		
	Assigned Effect Index Value	0.3	0.75	0.19	0.3	0.75	0.19	0.3	0.75	0.19	0	0.75	0.00	0	0.75	0.00	0.3	0.75	0.19	0.5	1	0.50	0.5	1	0.50
	Habitat degradation																								
	Energy resource reduction	x			x			x			x			x			x			x			x		
	Air quality impairment (chronic levels)	--			--			--			--			--			--			--			--		
	Water quality impairment (chronic levels)	x			x			x			--			--			--			x			x		
	Sediment quality impairment (chronic levels)	x			x			x			--			--			--			x			x		
	Reduction of structural habitat quality metrics	x			x			x			x			x			x			x			x		
	Assigned Effect Index Value	0.3	0.75	0.19	0.3	0.75	0.19	0.3	0.75	0.19	0	0.75	0.00	0	0.75	0.00	0.3	0.75	0.19	0.3	0.75	0.19	0.3	0.75	0.19
	Average Direct Effects	0.25		0.22	0.25		0.22	0.25		0.22	0.00		0.00	0.00		0.00	0.25		0.22	0.38		0.28	0.38		0.28
	Average Effects Index	0.25		0.20	0.25		0.20	0.25		0.20	0.00		0.00	0.00		0.00	0.25		0.20	0.38		0.31	0.38		0.31
	Magnitude of Effects	**0.25**		**0.22**	**0.25**		**0.22**	**0.25**		**0.22**	**0.00**		**0.00**	**0.00**		**0.00**	**0.25**		**0.22**	**0.38**		**0.31**	**0.38**		**0.31**
Nesting	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			x			x			x			x			x		
	Impair behavior/timing patterns	x			x			x			x			x			x			x			x		
	Physical harm or harassment	--			--			--			--			--			--			--			--		
	Assigned Effect Index Value	0.3	1	0.25	0.3	1	0.25	0.3	1	0.25	0	1	0.00	0	1	0.00	0.3	1	0.25	0.8	0.75	0.56	0.8	0.75	0.56
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		

Effects and Pathways	Single Element Structures																		Multiple Element Structures					
	Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
Water impairment (acute levels)	--			--			--			--			--			--			--			--		
Sediment quality impairment (acute levels)	--			--			--			--			--			--			--			--		
Permanent habitat destruction/displacement	x			x			x			x			x			x			x			x		
Permanently inaccessible habitat	x			x			x			--			--			x			--			--		
Assigned Effect Index Value	0.3	0.75	0.19	0.3	0.75	0.19	0.3	0.75	0.19	0	0.75	0.00	0	0.75	0.00	0.3	0.75	0.19	0.3	0.75	0.19	0.3	0.75	0.19
Indirect Effect																								
Habitat loss																								
Temporary destruction/displacement	x			x			x			x			x			x			--			--		
Temporarily inaccessible	x			x			x			x			x			x			x			x		
Assigned Effect Index Value	0	0.75	0.00	0	0.75	0.00	0	0.75	0.00	0	0.75	0.00	0	0.75	0.00	0	0.75	0.00	0.5	1	0.50	0.5	1	0.50
Habitat degradation																								
Energy resource reduction	x			x			x			x			x			x			x			x		
Air quality impairment (chronic levels)	--			--			--			--			--			--			--			--		
Water quality impairment (chronic levels)	x			x			x			--			--			--			x			x		
Sediment quality impairment (chronic levels)	x			x			x			--			--			--			x			x		
Reduction of structural habitat quality metrics	x			x			x			x			x			x			x			x		
Assigned Effect Index Value	0.3	0.75	0.19	0.3	0.75	0.19	0.3	0.75	0.19	0	0.75	0.00	0	0.75	0.00	0.3	0.75	0.19	0.3	0.75	0.19	0.3	0.75	0.19
Average Direct Effects	0.25		0.22	0.25		0.22	0.25		0.22	0.00		0.00	0.00		0.00	0.25		0.22	0.50		0.38	0.50		0.38
Average Effects Index	0.19		0.16	0.19		0.16	0.19		0.16	0.00		0.00	0.00		0.00	0.19		0.16	0.44		0.36	0.44		0.36
Magnitude of Effects	**0.25**		**0.22**	**0.25**		**0.22**	**0.25**		**0.22**	**0.00**		**0.00**	**0.00**		**0.00**	**0.25**		**0.22**	**0.50**		**0.38**	**0.50**		**0.38**

Black tern

	Effects and Pathways	Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
		EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
Migration	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			x			NA			NA			x			x		
	Impair behavior/timing patterns	x			x			x			--			NA			NA			x			x		
	Physical harm or harassment	--			--			--			--			NA			NA			x			x		
	Assigned Effect Index Value	0.5	1	0.50	0.5	1	0.50	0.5	1	0.50	0	1	0.00	NA	1	NA	NA	1	NA	0.25	0.75	0.19	0.25	0.75	0.19
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			NA			NA			--			--		
	Water impairment (acute levels)	--			--			--			--			NA			NA			--			--		
	Sediment quality impairment (acute levels)	--			--			--			--			NA			NA			--			--		
	Permanent habitat destruction/displacement	x			x			x			x			NA			NA			x			x		
	Permanently inaccessible habitat	x			x			x			x			NA			NA			--			--		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.75	0.75	0.56	0.25	0.75	0.19	NA	0.75	NA	NA	0.75	NA	0	0.75	0.00	0	0.75	0.00
	Indirect Effect																								
	Habitat loss																								
	Temporary destruction/displacement	x			x			x			x			NA			NA			--			--		
	Temporarily inaccessible	x			x			x			--			NA			NA			x			x		
	Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38	0	0.75	0.00	NA	0.75	NA	NA	0.75	NA	0.25	1	0.25	0.25	1	0.25
	Habitat degradation																								
	Energy resource reduction	x			x			x			x			NA			NA			x			x		
	Air quality impairment (chronic levels)	--			--			--			--			NA			NA			--			--		
	Water quality impairment (chronic levels)	--			--			--			--			NA			NA			x			x		
	Sediment quality impairment (chronic levels)	--			--			--			--			NA			NA			--			--		
	Reduction of structural habitat quality metrics	x			x			x			x			NA			NA			x			x		

		Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
	Effects and Pathways	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**
	Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38	0	0.75	0.00	NA	0.75	NA	NA	0.75	NA	0.25	0.75	0.19	0.25	0.75	0.19
	Average Direct Effects	0.63		0.53	0.63		0.53	0.63		0.53	0.13		0.09	NA		NA	NA		NA	0.13		0.09	0.13		0.09
	Average Effects Index	0.56		0.45	0.56		0.45	0.56		0.45	0.06		0.05	NA		NA	NA		NA	0.19		0.16	0.19		0.16
	Magnitude of Effects	**0.63**		**0.53**	**0.63**		**0.53**	**0.63**		**0.53**	**0.13**		**0.09**	**NA**		**NA**	**NA**		**NA**	**0.19**		**0.16**	**0.19**		**0.16**
Nesting	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			x			NA			NA			x			x		
	Impair behavior/timing patterns	x			x			x			--			NA			NA			x			x		
	Physical harm or harassment	--			--			--			--			NA			NA			x			x		
	Assigned Effect Index Value	0.5	1	0.50	0.5	1	0.50	0.5	1	0.50	0.25	1	0.25	NA	1	NA	NA	1	NA	0.25	0.75	0.19	0.25	0.75	0.19
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			NA			NA			--			--		
	Water impairment (acute levels)	--			--			--			--			NA			NA			--			--		
	Sediment quality impairment (acute levels)	--			--			--			--			NA			NA			--			--		
	Permanent habitat destruction/displacement	x			x			x			x			NA			NA			x			x		
	Permanently inaccessible habitat	x			x			x			x			NA			NA			--			--		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.75	0.75	0.56	0.25	0.75	0.19	NA	0.75	NA	NA	0.75	NA	0.25	0.75	0.19	0	0.75	0.00
	Indirect Effect																								
	Habitat loss																								
	Temporary destruction/displacement	x			x			x			x			NA			NA			--			--		
	Temporarily inaccessible	x			x			x			--			NA			NA			x			x		
	Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38	0.25	0.75	0.19	NA	0.75	NA	NA	0.75	NA	0.25	1	0.25	0.25	1	0.25
	Habitat degradation																								
	Energy resource reduction	x			x			x			x			NA			NA			x			x		
	Air quality impairment (chronic levels)	--			--			--			--			NA			NA			--			--		

	Effects and Pathways	Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
		EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
	Water quality impairment (chronic levels)	--			--			--			--			NA			NA			x			x		
	Sediment quality impairment (chronic levels)	--			--			--			--			NA			NA			--			--		
	Reduction of structural habitat quality metrics	x			x			x			x			NA			NA			x			--		
	Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38	0.25	0.75	0.19	NA	0.75	NA	NA	0.75	NA	0.25	0.75	0.19	0.25	0.75	0.19
	Average Direct Effects	0.63		0.53	0.63		0.53	0.63		0.53	0.25		0.22	NA		NA	NA		NA	0.25		0.19	0.13		0.09
	Average Effects Index	0.56		0.45	0.56		0.45	0.56		0.45	0.25		0.20	NA		NA	NA		NA	0.25		0.20	0.19		0.16
	Magnitude of Effects	**0.63**		**0.53**	**0.63**		**0.53**	**0.63**		**0.53**	**0.25**		**0.22**	**NA**		**NA**	**NA**		**NA**	**0.25**		**0.20**	**0.19**		**0.16**

Brown pelican

	Effects and Pathways	Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
		EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
Resident / Non-nesting	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			x			x			x			x			x		
	Impair behavior/timing patterns	x			x			x			x			x			x			x			x		
	Physical harm or harassment	--			--			--			--			--			--			x			x		
	Assigned Effect Index Value	0.5	1	0.50	0.5	1	0.50	0.5	1	0.50	0.25	1	0.25	0.25	1	0.25	0.5	1	0.50	0.5	0.75	0.38	0.25	0.75	0.19
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Water impairment (acute levels)	--			--			--			--			--			--			--			--		
	Sediment quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Permanent habitat destruction/displacement	x			x			x			x			x			x			x			x		
	Permanently inaccessible habitat	x			x			x			x			x			x			--			--		

	Single Element Structures																		Multiple Element Structures					
	Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
Effects and Pathways	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**
Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38	0.25	0.75	0.19	0.25	0.75	0.19	0.5	0.75	0.38	0.25	0.75	0.19	0.25	0.75	0.19
Indirect Effect																								
Habitat loss																								
Temporary destruction/displacement	x			x			x			x			x			x			--			--		
Temporarily inaccessible	x			x			x			x			x			x			x			x		
Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38	0.25	0.75	0.19	0.25	0.75	0.19	0.5	0.75	0.38	0.25	1	0.25	0.25	1	0.25
Habitat degradation																								
Energy resource reduction	x			x			x			x			x			x			x			x		
Air quality impairment (chronic levels)	--			--			--			--			--			--			--			--		
Water quality impairment (chronic levels)	x			x			x			--			--			--			x			x		
Sediment quality impairment (chronic levels)	--			--			--			--			--			--			--			--		
Reduction of structural habitat quality metrics	x			x			x			x			x			x			x			x		
Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38	0.25	0.75	0.19	0.25	0.75	0.19	0.5	0.75	0.38	0.5	0.75	0.38	0.25	0.75	0.19
Average Direct Effects	0.50		0.44	0.50		0.44	0.50		0.44	0.25		0.22	0.25		0.22	0.50		0.44	0.38		0.28	0.25		0.19
Average Effects Index	0.50		0.41	0.50		0.41	0.50		0.41	0.25		0.20	0.25		0.20	0.50		0.41	0.38		0.30	0.25		0.20
Magnitude of Effects	**0.50**		**0.44**	**0.50**		**0.44**	**0.50**		**0.44**	**0.25**		**0.22**	**0.25**		**0.22**	**0.50**		**0.44**	**0.38**		**0.30**	**0.25**		**0.20**

Common loon

	Effects and Pathways	Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
		EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
Non-nesting	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			x			x			x			x			x		
	Impair behavior/timing patterns	x			x			x			x			x			x			x			x		
	Physical harm or harassment	--			--			--			--			--			--			x			x		
	Assigned Effect Index Value	0.5	1	0.50	0.5	1	0.50	0.5	1	0.50	0.25	1	0.25	0.25	1	0.25	0.5	1	0.50	0.25	0.75	0.19	0.25	0.75	0.19
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Water impairment (acute levels)	--			--			--			--			--			--			--			--		
	Sediment quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Permanent habitat destruction/displacement	x			x			x			x			x			x			x			x		
	Permanently inaccessible habitat	x			x			x			x			x			x			--			--		
	Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38	0.25	0.75	0.19	0.25	0.75	0.19	0.5	0.75	0.38	0.25	0.75	0.19	0.25	0.75	0.19
	Indirect Effect																								
	Habitat loss																								
	Temporary destruction/displacement	x			x			x			x			x			x			--			--		
	Temporarily inaccessible	x			x			x			x			x			x			x			x		
	Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38	0.25	0.75	0.19	0.25	0.75	0.19	0.5	0.75	0.38	0.25	1	0.25	0.25	1	0.25
	Habitat degradation																								
	Energy resource reduction	x			x			x			x			x			x			x			x		
	Air quality impairment (chronic levels)	--			--			--			--			--			--			--			--		
	Water quality impairment (chronic levels)	--			--			--			--			--			--			x			x		
	Sediment quality impairment (chronic levels)	--			--			--			--			--			--			--			--		
	Reduction of structural habitat quality metrics	x			x			x			x			x			x			x			x		

		Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
	Effects and Pathways	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**
	Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38	0.25	0.75	0.19	0.25	0.75	0.19	0.5	0.75	0.38	0.5	0.75	0.38	0.25	0.75	0.19
	Average Direct Effects	0.50		0.44	0.50		0.44	0.50		0.44	0.25		0.22	0.25		0.22	0.50		0.44	0.25		0.19	0.25		0.19
	Average Effects Index	0.50		0.41	0.50		0.41	0.50		0.41	0.25		0.20	0.25		0.20	0.50		0.41	0.31		0.25	0.25		0.20
	Magnitude of Effects	**0.50**		**0.44**	**0.50**		**0.44**	**0.50**		**0.44**	**0.25**		**0.22**	**0.25**		**0.22**	**0.50**		**0.44**	**0.31**		**0.25**	**0.25**		**0.20**
Nesting	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			x			x			x			x			x		
	Impair behavior/timing patterns	x			x			x			x			x			x			x			x		
	Physical harm or harassment	--			--			--			--			--			--			x			x		
	Assigned Effect Index Value	0.75	1	0.75	0.75	1	0.75	0.75	1	0.75	0.25	1	0.25	0.25	1	0.25	0.75	1	0.75	0.25	0.75	0.19	0.25	0.75	0.19
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Water impairment (acute levels)	--			--			--			--			--			--			--			--		
	Sediment quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Permanent habitat destruction/displacement	x			x			x			x			x			x			x			x		
	Permanently inaccessible habitat	x			x			x			x			x			x			--			--		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.75	0.75	0.56	0.25	0.75	0.19	0.25	0.75	0.19	0.75	0.75	0.56	0.25	0.75	0.19	0.25	0.75	0.19
	Indirect Effect																								
	Habitat loss																								
	Temporary destruction/displacement	x			x			x			x			x			x			--			--		
	Temporarily inaccessible	x			x			x			x			x			x			x			x		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.75	0.75	0.56	0.25	0.75	0.19	0.25	0.75	0.19	0.75	0.75	0.56	0.25	1	0.25	0.25	1	0.25
	Habitat degradation																								
	Energy resource reduction	x			x			x			x			x			x			x			x		
	Air quality impairment (chronic levels)	--			--			--			--			--			--			--			--		

	Effects and Pathways	Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
		EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
	Water quality impairment (chronic levels)	x			x			x			--			--			--			x			x		
	Sediment quality impairment (chronic levels)	x			x			x			--			--			--			--			--		
	Reduction of structural habitat quality metrics	x			x			x			x			x			x			x			x		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.75	0.75	0.56	0.25	0.75	0.19	0.25	0.75	0.19	0.75	0.75	0.56	0.5	0.75	0.38	0.25	0.75	0.19
	Average Direct Effects	0.75		0.66	0.75		0.66	0.75		0.66	0.25		0.22	0.25		0.22	0.75		0.66	0.25		0.19	0.25		0.19
	Average Effects Index	0.75		0.61	0.75		0.61	0.75		0.61	0.25		0.20	0.25		0.20	0.75		0.61	0.31		0.25	0.25		0.20
	Magnitude of Effects	**0.75**		**0.66**	**0.75**		**0.66**	**0.75**		**0.66**	**0.25**		**0.22**	**0.25**		**0.22**	**0.75**		**0.66**	**0.31**		**0.25**	**0.25**		**0.20**

Harlequin duck

	Effects and Pathways	Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
		EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
Non-nesting	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			x			x			x			x			x		
	Impair behavior/timing patterns	x			x			x			x			x			x			x			x		
	Physical harm or harassment	--			--			--			--			--			--			--			--		
	Assigned Effect Index Value	0.5	1	0.50	0.5	1	0.50	0.5	1	0.50	0.25	1	0.25	0.25	1	0.25	0.5	1	0.50	0.25	0.75	0.19	0.25	0.75	0.19
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Water impairment (acute levels)	--			--			--			--			--			--			--			--		
	Sediment quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Permanent habitat destruction/displacement	x			x			x			x			x			x			x			x		

		Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
	Effects and Pathways	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**
	Permanently inaccessible habitat	x			x			x			x			x			x			--			--		
	Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38	0.25	0.75	0.19	0.25	0.75	0.19	0.5	0.75	0.38	0.25	0.75	0.19	0.25	0.75	0.19
	Indirect Effect																								
	Habitat loss																								
	Temporary destruction/displacement	x			x			x			x			x			x			--			--		
	Temporarily inaccessible	x			x			x			x			x			x			x			x		
	Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38	0.25	0.75	0.19	0.25	0.75	0.19	0.5	0.75	0.38	0.5	1	0.50	0.5	1	0.50
	Habitat degradation																								
	Energy resource reduction	x			x			x			x			x			x			x			x		
	Air quality impairment (chronic levels)	--			--			--			--			--			--			--			--		
	Water quality impairment (chronic levels)	--			--			--			--			--			--			x			x		
	Sediment quality impairment (chronic levels)	--			--			--			--			--			--			x			x		
	Reduction of structural habitat quality metrics	x			x			x			x			x			x			x			x		
	Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38	0.25	0.75	0.19	0.25	0.75	0.19	0.5	0.75	0.38	0.5	0.75	0.38	0.25	0.75	0.19
	Average Direct Effects	0.50		0.44	0.50		0.44	0.50		0.44	0.25		0.22	0.25		0.22	0.50		0.44	0.25		0.19	0.25		0.19
	Average Effects Index	0.50		0.41	0.50		0.41	0.50		0.41	0.25		0.20	0.25		0.20	0.50		0.41	0.38		0.31	0.31		0.27
	Magnitude of Effects	**0.50**		**0.44**	**0.50**		**0.44**	**0.50**		**0.44**	**0.25**		**0.22**	**0.25**		**0.22**	**0.50**		**0.44**	**0.38**		**0.31**	**0.31**		**0.27**
Nesting	**Direct Effect**																								
	Species level																								
	Increased activity	NA			NA			x			NA			NA			NA			x			NA		
	Impair behavior/timing patterns	NA			NA			x			NA			NA			NA			--			NA		
	Physical harm or harassment	NA			NA			--			NA			NA			NA			--			NA		
	Assigned Effect Index Value	NA	1	NA	NA	1	NA	0.5	1	0.50	NA	1	NA	NA	1	NA	NA	1	NA	0.25	0.75	0.19	NA	0.75	NA
	Habitat level																								
	Air quality impairment (acute levels)	NA			NA			--			NA			NA			NA			--			NA		

Effects and Pathways	Single Element Structures																		Multiple Element Structures					
	Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
Water impairment (acute levels)	NA			NA			--			NA			NA			NA			--			NA		
Sediment quality impairment (acute levels)	NA			NA			--			NA			NA			NA			--			NA		
Permanent habitat destruction/displacement	NA			NA			x			NA			NA			NA			x			NA		
Permanently inaccessible habitat	NA			NA			x			NA			NA			NA			--			NA		
Assigned Effect Index Value	NA	0.75	NA	NA	0.75	NA	0.75	0.75	0.56	NA	0.75	NA	NA	0.75	NA	NA	0.75	NA	0.25	0.75	0.19	NA	0.75	NA
Indirect Effect																								
Habitat loss																								
Temporary destruction/displacement	NA			NA			x			NA			NA			NA			--			NA		
Temporarily inaccessible	NA			NA			x			NA			NA			NA			x			NA		
Assigned Effect Index Value	NA	0.75	NA	NA	0.75	NA	0.5	0.75	0.38	NA	0.75	NA	NA	0.75	NA	NA	0.75	NA	0.5	1	0.50	NA	1	NA
Habitat degradation																								
Energy resource reduction	NA			NA			x			NA			NA			NA			--			NA		
Air quality impairment (chronic levels)	NA			NA			--			NA			NA			NA			--			NA		
Water quality impairment (chronic levels)	NA			NA			--			NA			NA			NA			x			NA		
Sediment quality impairment (chronic levels)	NA			NA			--			NA			NA			NA			x			NA		
Reduction of structural habitat quality metrics	NA			NA			x			NA			NA			NA			x			NA		
Assigned Effect Index Value	NA	0.75	NA	NA	0.75	NA	0.5	0.75	0.38	NA	0.75	NA	NA	0.75	NA	NA	0.75	NA	0.5	0.75	0.38	NA	0.75	NA
Average Direct Effects	NA		NA	NA		NA	0.63		0.53	NA		NA	NA		NA	NA		NA	0.25		0.19	NA		NA
Average Effects Index	NA		NA	NA		NA	0.56		0.45	NA		NA	NA		NA	NA		NA	0.38		0.31	NA		NA
Magnitude of Effects	**NA**		**NA**	**NA**		**NA**	**0.63**		**0.53**	**NA**		**NA**	**NA**		**NA**	**NA**		**NA**	**0.38**		**0.31**	**NA**		**NA**

Marbled murrelet

		Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
	Effects and Pathways	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**
Non-nesting	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			x			x			x			x			x		
	Impair behavior/timing patterns	x			x			x			x			x			x			x			x		
	Physical harm or harassment	--			--			--			--			--			--			x			x		
	Assigned Effect Index Value	0.5	1	0.50	0.5	1	0.50	0.5	1	0.50	0.5	1	0.50	0.5	1	0.50	0.5	1	0.50	0.25	0.75	0.19	0.25	0.75	0.19
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Water impairment (acute levels)	--			--			--			--			--			--			--			--		
	Sediment quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Permanent habitat destruction/displacement	x			x			x			x			x			x			x			x		
	Permanently inaccessible habitat	--			--			--			--			--			--			--			--		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19	0.25	0.75	0.19	0	0.75	0.00	0	0.75	0.00	0.25	0.75	0.19	0.25	0.75	0.19	0.25	0.75	0.19
	Indirect Effect																								
	Habitat loss																								
	Temporary destruction/displacement	x			x			x			x			x			x			--			--		
	Temporarily inaccessible	x			x			x			x			x			x			x			x		
	Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38	0.25	0.75	0.19	0.25	0.75	0.19	0.25	0.75	0.19	0.5	1	0.50	0.5	1	0.50
	Habitat degradation																								
	Energy resource reduction	x			x			x			x			x			x			x			x		
	Air quality impairment (chronic levels)	--			--			--			--			--			--			--			--		
	Water quality impairment (chronic levels)	x			x			x			--			--			--			x			x		
	Sediment quality impairment (chronic levels)	x			x			x			--			--			--			--			--		
	Reduction of structural habitat quality metrics	x			x			x			x			x			x			x			x		

	Effects and Pathways	Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
		EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
	Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38	0.25	0.75	0.19	0.25	0.75	0.19	0.25	0.75	0.19	0.5	0.75	0.38	0.25	0.75	0.19
	Average Direct Effects	0.38		0.34	0.38		0.34	0.38		0.34	0.25		0.25	0.25		0.25	0.38		0.34	0.25		0.19	0.25		0.19
	Average Effects Index	0.44		0.36	0.44		0.36	0.44		0.36	0.25		0.22	0.25		0.22	0.31		0.27	0.38		0.31	0.31		0.27
	Magnitude of Effects	**0.44**		**0.36**	**0.44**		**0.36**	**0.44**		**0.36**	**0.25**		**0.25**	**0.25**		**0.25**	**0.38**		**0.34**	**0.38**		**0.31**	**0.31**		**0.27**
Nesting	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			x			x			x			x			x		
	Impair behavior/timing patterns	x			x			x			x			x			x			x			x		
	Physical harm or harassment	--			--			--			--			--			--			--			--		
	Assigned Effect Index Value	0.5	1	0.50	0.5	1	0.50	0.5	1	0.50	0.5	1	0.50	0.5	1	0.50	0.5	1	0.50	0.5	0.75	0.38	0.5	0.75	0.38
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Water impairment (acute levels)	--			--			--			--			--			--			--			--		
	Sediment quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Permanent habitat destruction/displacement	x			x			x			x			x			x			x			x		
	Permanently inaccessible habitat	--			--			--			--			--			--			--			--		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19	0.25	0.75	0.19	0	0.75	0.00	0	0.75	0.00	0.25	0.75	0.19	0.25	0.75	0.19	0.25	0.75	0.19
	Indirect Effect																								
	Habitat loss																								
	Temporary destruction/displacement	x			x			x			x			x			x			--			--		
	Temporarily inaccessible	x			x			x			x			x			x			x			x		
	Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38	0.25	0.75	0.19	0.25	0.75	0.19	0.25	0.75	0.19	0.5	1	0.50	0.5	1	0.50
	Habitat degradation																								
	Energy resource reduction	x			x			x			x			x			x			x			x		
	Air quality impairment (chronic levels)	--			--			--			--			--			--			--			--		

	Effects and Pathways	Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
		EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
	Water quality impairment (chronic levels)	x			x			x			--			--			--			x			x		
	Sediment quality impairment (chronic levels)	x			x			x			--			--			--			--			--		
	Reduction of structural habitat quality metrics	x			x			x			x			x			x			x			x		
	Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38	0	0.75	0.00	0	0.75	0.00	0.25	0.75	0.19	0.5	0.75	0.38	0.5	0.75	0.38
	Average Direct Effects	0.38		0.34	0.38		0.34	0.38		0.34	0.25		0.25	0.25		0.25	0.38		0.34	0.38		0.28	0.38		0.28
	Average Effects Index	0.44		0.36	0.44		0.36	0.44		0.36	0.19		0.17	0.19		0.17	0.31		0.27	0.44		0.36	0.44		0.36
	Magnitude of Effects	**0.44**		**0.36**	**0.44**		**0.36**	**0.44**		**0.36**	**0.25**		**0.25**	**0.25**		**0.25**	**0.38**		**0.34**	**0.44**		**0.36**	**0.44**		**0.36**

Western snowy plover

	Effects and Pathways	Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
		EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
Wintering	**Direct Effect**																								
	Species level																								
	Increased activity	x			NA			x			NA			NA			NA			NA			x		
	Impair behavior/timing patterns	x			NA			x			NA			NA			NA			NA			x		
	Physical harm or harassment	--			NA			--			NA			NA			NA			NA			x		
	Assigned Effect Index Value	0.75	1	0.75	NA	1	NA	1	1	1.00	NA	1	NA	NA	1	NA	NA	1	NA	NA	0.75	NA	0.25	0.75	0.19
	Habitat level																								
	Air quality impairment (acute levels)	--			NA			--			NA			NA			NA			NA			--		
	Water impairment (acute levels)	--			NA			--			NA			NA			NA			NA			--		
	Sediment quality impairment (acute levels)	--			NA			--			NA			NA			NA			NA			--		
	Permanent habitat destruction/displacement	x			NA			x			NA			NA			NA			NA			x		
	Permanently inaccessible habitat	x			NA			x			NA			NA			NA			NA			--		

		Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
	Effects and Pathways	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**
	Assigned Effect Index Value	0.75	0.75	0.56	NA	0.75	NA	1	0.75	0.75	NA	0.75	NA	NA	0.75	NA	NA	0.75	NA	NA	0.75	NA	0.25	0.75	0.19
	Indirect Effect																								
	Habitat loss																								
	Temporary destruction/displacement	x			NA			x			NA			NA			NA			NA			--		
	Temporarily inaccessible	x			NA			x			NA			NA			NA			NA			--		
	Assigned Effect Index Value	0.75	0.75	0.56	NA	0.75	NA	1	0.75	0.75	NA	0.75	NA	NA	0.75	NA	NA	0.75	NA	NA	1	NA	0	1	0.00
	Habitat degradation																								
	Energy resource reduction	x			NA			x			NA			NA			NA			NA			x		
	Air quality impairment (chronic levels)	--			NA			--			NA			NA			NA			NA			--		
	Water quality impairment (chronic levels)	--			NA			--			NA			NA			NA			NA			x		
	Sediment quality impairment (chronic levels)	--			NA			--			NA			NA			NA			NA			--		
	Reduction of structural habitat quality metrics	x			NA			x			NA			NA			NA			NA			x		
	Assigned Effect Index Value	0.75	0.75	0.56	NA	0.75	NA	1	0.75	0.75	NA	0.75	NA	NA	0.75	NA	NA	0.75	NA	NA	0.75	NA	0.5	0.75	0.38
	Average Direct Effects	0.75		0.66	NA		NA	1.00		0.88	NA		NA	NA		NA	NA		NA	NA		NA	0.25		0.19
	Average Effects Index	0.75		0.61	NA		NA	1.00		0.81	NA		NA	NA		NA	NA		NA	NA		NA	0.25		0.19
	Magnitude of Effects	**0.75**		**0.66**	**NA**		**NA**	**1.00**		**0.88**	**NA**		**NA**	**NA**		**NA**	**NA**		**NA**	**NA**		**NA**	**0.25**		**0.19**
Nesting	**Direct Effect**																								
	Species level																								
	Increased activity	x			NA			x			NA			NA			NA			NA			x		
	Impair behavior/timing patterns	x			NA			x			NA			NA			NA			NA			x		
	Physical harm or harassment	--			NA			--			NA			NA			NA			NA			x		
	Assigned Effect Index Value	0.75	1	0.75	NA	1	NA	1	1	1.00	NA	1	NA	NA	1	NA	NA	1	NA	NA	0.75	NA	0.5	0.75	0.38
	Habitat level																								
	Air quality impairment (acute levels)	--			NA			--			NA			NA			NA			NA			--		
	Water impairment (acute levels)	--			NA			--			NA			NA			NA			NA			--		

	Single Element Structures																		Multiple Element Structures					
	Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
Effects and Pathways	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**
Sediment quality impairment (acute levels)	--			NA			--			NA			NA			NA			NA			--		
Permanent habitat destruction/displacement	x			NA			x			NA			NA			NA			NA			x		
Permanently inaccessible habitat	x			NA			x			NA			NA			NA			NA			--		
Assigned Effect Index Value	0.75	0.75	0.56	NA	0.75	NA	1	0.75	0.75	NA	0.75	NA	NA	0.75	NA	NA	0.75	NA	NA	0.75	NA	0.25	0.75	0.19
Indirect Effect																								
Habitat loss																								
Temporary destruction/displacement	x			NA			x			NA			NA			NA			NA			--		
Temporarily inaccessible	x			NA			x			NA			NA			NA			NA			--		
Assigned Effect Index Value	0.75	0.75	0.56	NA	0.75	NA	1	0.75	0.75	NA	0.75	NA	NA	0.75	NA	NA	0.75	NA	NA	1	NA	0	1	0.00
Habitat degradation																								
Energy resource reduction	x			NA			x			NA			NA			NA			NA			x		
Air quality impairment (chronic levels)	--			NA			--			NA			NA			NA			NA			--		
Water quality impairment (chronic levels)	--			NA			--			NA			NA			NA			NA			x		
Sediment quality impairment (chronic levels)	--			NA			--			NA			NA			NA			NA			--		
Reduction of structural habitat quality metrics	x			NA			x			NA			NA			NA			NA			x		
Assigned Effect Index Value	0.75	0.75	0.56	NA	0.75	NA	1	0.75	0.75	NA	0.75	NA	NA	0.75	NA	NA	0.75	NA	NA	0.75	NA	0.5	0.75	0.38
Average Direct Effects	0.75		0.66	NA		NA	1.00		0.88	NA		NA	NA		NA	NA		NA	NA		NA	0.38		0.28
Average Effects Index	0.75		0.61	NA		NA	1.00		0.81	NA		NA	NA		NA	NA		NA	NA		NA	0.31		0.23
Magnitude of Effects	**0.75**		**0.66**	**NA**		**NA**	**1.00**		**0.88**	**NA**		**NA**	**NA**		**NA**	**NA**		**NA**	**NA**		**NA**	**0.38**		**0.28**

FISH

Pacific salmon, trout and char

		Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
	Effects and Pathways	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**
Adult	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			--			--			x			x			x		
	Impair behavior/timing patterns	x			x			x			--			--			x			x			x		
	Physical harm or harassment	--			--			--			--			--			--			x			x		
	Assigned Effect Index Value	0.75	1	0.75	0.25	1	0.25	0.5	1	0.50	0	1	0.00	0	1	0.00	0.5	1	0.50	0.25	0.75	0.19	0.25	0.75	0.19
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Water impairment (acute levels)	x			x			--			--			--			--			x			--		
	Sediment quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Permanent habitat destruction/displacement	--			--			x			x			x			x			x			x		
	Permanently inaccessible habitat	x			x			x			x			x			x			--			--		
	Assigned Effect Index Value	0.75	0.75	0.56	0.25	0.75	0.19	0.5	0.75	0.38	0	0.75	0.00	0	0.75	0.00	0.5	0.75	0.38	0.5	1	0.50	0.25	1	0.25
	Indirect Effect																								
	Habitat loss																								
	Temporary destruction/displacement	x			x			x			x			x			x			x			x		
	Temporarily inaccessible	x			x			x			x			x			x			--			--		
	Assigned Effect Index Value	0.75	0.75	0.56	0.25	0.75	0.19	0.5	0.75	0.38	0.25	0.75	0.19	0.25	0.75	0.19	0.5	0.75	0.38	0.25	1	0.25	0.25	1	0.25
	Habitat degradation																								
	Energy resource reduction	x			x			--			x			x			x			x			x		
	Air quality impairment (chronic levels)	--			--			x			--			--			--			--			--		
	Water quality impairment (chronic levels)	x			x			x			--			--			--			x			x		
	Sediment quality impairment (chronic levels)	x			x			x			--			--			--			--			--		

	Effects and Pathways	Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
		EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
	Reduction of structural habitat quality metrics	x			x			--			x			x			x			x			x		
	Assigned Effect Index Value	0.75	0.75	0.56	0.25	0.75	0.19	0.5	0.75	0.38	0.25	0.75	0.19	0.25	0.75	0.19	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38
	Average Direct Effects	0.75		0.66	0.25		0.22	0.50		0.44	0.00		0.00	0.00		0.00	0.50		0.44	0.38		0.34	0.25		0.22
	Average Effects Index	0.75		0.61	0.25		0.20	0.50		0.41	0.13		0.09	0.13		0.09	0.50		0.41	0.38		0.33	0.31		0.27
	Magnitude of Effects	**0.75**		**0.66**	**0.25**		**0.22**	**0.50**		**0.44**	**0.13**		**0.09**	**0.13**		**0.09**	**0.50**		**0.44**	**0.38**		**0.34**	**0.31**		**0.27**
Incubation / Emergence	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			--			--			x			--			--		
	Impair behavior/timing patterns	x			x			x			--			--			x			--			--		
	Physical harm or harassment	--			--			--			--			--			--			--			--		
	Assigned Effect Index Value	0.75	1	0.75	0.5	1	0.50	0.5	1	0.50	0	1	0.00	0	1	0.00	0.5	1	0.50	0	1	0.00	0	1	0.00
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Water impairment (acute levels)	x			x			--			--			--			--			--			--		
	Sediment quality impairment (acute levels)	x			x			--			--			--			--			--			--		
	Permanent habitat destruction/displacement	x			x			x			x			x			x			--			--		
	Permanently inaccessible habitat	x			x			x			x			x			x			--			--		
	Assigned Effect Index Value	0.75	1	0.75	0.5	1	0.50	0.5	1	0.50	0.25	1	0.25	0.25	1	0.25	0.5	1	0.50	0	1	0.00	0	1	0.00
	Indirect Effect																								
	Habitat loss																								
	Temporary destruction/displacement	x			x			x			--			--			x			--			--		
	Temporarily inaccessible	x			x			x			--			--			x			--			--		
	Assigned Effect Index Value	0.75	0.75	0.56	0.5	0.75	0.38	0.5	0.75	0.38	0	0.75	0.00	0	0.75	0.00	0.5	0.75	0.38	0	1	0.00	0	1	0.00
	Habitat degradation																								
	Energy resource reduction	x			x			--			x			x			x			--			--		

		Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
	Effects and Pathways	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**
	Air quality impairment (chronic levels)	--			--			x			--			--			--			--			--		
	Water quality impairment (chronic levels)	x			x			x			--			--			--			--			--		
	Sediment quality impairment (chronic levels)	x			x			x			--			--			--			--			--		
	Reduction of structural habitat quality metrics	x			x			--			x			x			x			--			--		
	Assigned Effect Index Value	0.75	1	0.75	0.5	1	0.50	0.5	1	0.50	0.25	1	0.25	0.25	1	0.25	0.5	1	0.50	0	1	0.00	0	1	0.00
	Average Direct Effects	0.75		0.75	0.50		0.50	0.50		0.50	0.13		0.13	0.13		0.13	0.50		0.50	0.00		0.00	0.00		0.00
	Average Effects Index	0.75		0.70	0.50		0.47	0.50		0.47	0.13		0.13	0.13		0.13	0.50		0.47	0.00		0.00	0.00		0.00
	Magnitude of Effects	**0.75**		**0.75**	**0.50**		**0.50**	**0.50**		**0.50**	**0.13**		**0.13**	**0.13**		**0.13**	**0.50**		**0.50**	**0.00**		**0.00**	**0.00**		**0.00**
Freshwater Rearing / Outmigration	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			x			x			--			x			x		
	Impair behavior/timing patterns	x			x			x			x			x			--			x			x		
	Physical harm or harassment	--			--			--			--			--			--			x			x		
	Assigned Effect Index Value	0.75	0.75	0.56	0.25	0.75	0.19	0.5	0.75	0.38	0.25	0.75	0.19	0.25	0.75	0.19	0.5	0.75	0.38	0.5	0.75	0.38	0.25	0.75	0.19
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Water impairment (acute levels)	--			--			--			--			--			--			x			--		
	Sediment quality impairment (acute levels)	--			--			--			--			--			--			x			--		
	Permanent habitat destruction/displacement	x			x			x			x			x			x			x			x		
	Permanently inaccessible habitat	x			x			x			x			x			x			--			--		
	Assigned Effect Index Value	0.75	0.75	0.56	0.25	0.75	0.19	0.5	0.75	0.38	0.25	0.75	0.19	0.25	0.75	0.19	0.5	0.75	0.38	0.5	0.75	0.38	0.25	0.75	0.19
	Indirect Effect																								
	Habitat loss																								
	Temporary destruction/displacement	x			x			x			--			--			x			x			x		
	Temporarily inaccessible	x			x			x			--			--			x			x			--		
	Assigned Effect Index Value	0.75	0.75	0.56	0.25	0.75	0.19	0.5	0.75	0.38	0	0.75	0.00	0	0.75	0.00	0.5	0.75	0.38	0.75	1	0.75	0.25	1	0.25

	Effects and Pathways	Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
		EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
	Habitat degradation																								
	Energy resource reduction	x			x			--			x			x			x			x			x		
	Air quality impairment (chronic levels)	--			--			x			--			--			--			--			--		
	Water quality impairment (chronic levels)	x			x			x			--			--			--			x			x		
	Sediment quality impairment (chronic levels)	x			x			x			--			--			--			x			x		
	Reduction of structural habitat quality metrics	x			x			x			x			x			x			x			x		
	Assigned Effect Index Value	0.75	0.5	0.38	0.25	0.5	0.13	0.5	0.5	0.25	0.25	0.5	0.13	0.25	0.5	0.13	0.5	0.5	0.25	0.75	0.75	0.56	0.5	0.75	0.38
	Average Direct Effects	0.75		0.56	0.25		0.19	0.50		0.38	0.25		0.19	0.25		0.19	0.50		0.38	0.50		0.38	0.25		0.19
	Average Effects Index	0.75		0.52	0.25		0.17	0.50		0.34	0.19		0.13	0.19		0.13	0.50		0.34	0.63		0.52	0.31		0.25
	Magnitude of Effects	**0.75**		**0.56**	**0.25**		**0.19**	**0.50**		**0.38**	**0.25**		**0.19**	**0.25**		**0.19**	**0.50**		**0.38**	**0.63**		**0.52**	**0.31**		**0.25**

Green sturgeon

	Effects and Pathways	Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
		EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
Adult/	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			x			x			x			x			x		
	Impair behavior/timing patterns	--			--			--			--			--			--			x			x		
	Physical harm or harassment	x			x			--			--			--			--			x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19	0.25	0.75	0.19	0	1	0.00	0	1	0.00	0.25	1	0.25	0.25	0.75	0.19	0.25	0.75	0.19
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		

Effects and Pathways	Single Element Structures																		Multiple Element Structures					
	Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
Water impairment (acute levels)	--			--			--			--			--			--			--			--		
Sediment quality impairment (acute levels)	--			--			--			--			--			--			--			--		
Permanent habitat destruction/displacement	x			x			x			x			x			x			x			x		
Permanently inaccessible habitat	--			--			--			--			--			--			--			--		
Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19	0.25	0.75	0.19	0	1	0.00	0	1	0.00	0.25	0.75	0.19	0.5	0.75	0.38	0.5	0.75	0.38
Indirect Effect																								
Habitat loss																								
Temporary destruction/displacement	x			x			x			x			x			x			--			--		
Temporarily inaccessible	x			x			x			x			x			x			x			x		
Assigned Effect Index Value	0	1	0.00	0	1	0.00	0	1	0.00	0	1	0.00	0	1	0.00	0	1	0.00	0	1	0.00	0.25	1	0.25
Habitat degradation																								
Energy resource reduction	x			x			x			--			--			x			x			x		
Air quality impairment (chronic levels)	--			--			--			--			--			--			--			--		
Water quality impairment (chronic levels)	x			x			x			--			--			x			x			x		
Sediment quality impairment (chronic levels)	x			x			x			x			x			x			x			x		
Reduction of structural habitat quality metrics	x			x			x			x			x			--			x			x		
Assigned Effect Index Value	0.25	0.5	0.13	0.25	0.5	0.13	0.5	0.75	0.38	0.25	0.25	0.06	0.25	0.25	0.06	0.25	0.5	0.13	0.5	0.75	0.38	0.5	0.75	0.38
Average Direct Effects	0.25		0.19	0.25		0.19	0.25		0.19	0.00		0.00	0.00		0.00	0.25		0.22	0.38		0.28	0.38		0.28
Average Effects Index	0.19		0.13	0.19		0.13	0.25		0.19	0.06		0.02	0.06		0.02	0.19		0.14	0.31		0.23	0.38		0.30
Magnitude of Effects	**0.25**		**0.19**	**0.25**		**0.19**	**0.25**		**0.19**	**0.06**		**0.02**	**0.06**		**0.02**	**0.25**		**0.22**	**0.38**		**0.28**	**0.38**		**0.30**

White sturgeon

		Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
	Effects and Pathways	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**
Adult / Juvenile	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			x			x			--			x			x		
	Impair behavior/timing patterns	--			--			--			--			--			--			x			x		
	Physical harm or harassment	x			x			--			--			--			--			x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19	0.25	0.75	0.19	0	1	0.00	0	1	0.00	0	1	0.00	0.5	0.75	0.38	0.5	0.75	0.38
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Water impairment (acute levels)	--			--			--			--			--			--			--			--		
	Sediment quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Permanent habitat destruction/displacement	x			x			x			x			x			x			x			x		
	Permanently inaccessible habitat	x			x			--			x			--			x			--			--		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19	0.25	0.75	0.19	0	1	0.00	0	1	0.00	0.25	0.75	0.19	0.5	0.75	0.38	0.5	0.75	0.38
	Indirect Effect																								
	Habitat loss																								
	Temporary destruction/displacement	x			x			x			--			--			--			x			x		
	Temporarily inaccessible	x			x			x			--			--			--			x			x		
	Assigned Effect Index Value	0.25	0.75	0.19	0.25	0.75	0.19	0.25	0.75	0.19	0	1	0.00	0	1	0.00	0	1	0.00	0.25	1	0.25	0.25	1	0.25
	Habitat degradation																								
	Energy resource reduction	x			x			x			x			x			--			x			x		
	Air quality impairment (chronic levels)	--			--			--			--			--			--			--			--		
	Water quality impairment (chronic levels)	x			x			x			--			--			--			x			x		
	Sediment quality impairment (chronic levels)	x			x			x			--			--			--			x			x		
	Reduction of structural habitat quality metrics	x			x			x			x			x			--			x			x		

	Effects and Pathways	Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
		EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
	Assigned Effect Index Value	0.25	0.5	0.13	0.25	0.5	0.13	0.5	0.75	0.38	0.25	0.25	0.06	0.25	0.25	0.06	0	1	0.00	0.5	0.75	0.38	0.5	0.75	0.38
	Average Direct Effects	0.25		0.19	0.25		0.19	0.25		0.19	0.00		0.00	0.00		0.00	0.13		0.09	0.50		0.38	0.50		0.38
	Average Effects Index	0.25		0.17	0.25		0.17	0.31		0.23	0.06		0.02	0.06		0.02	0.06		0.05	0.44		0.34	0.44		0.34
	Magnitude of Effects	**0.25**		**0.19**	**0.25**		**0.19**	**0.31**		**0.23**	**0.06**		**0.02**	**0.06**		**0.02**	**0.13**		**0.09**	**0.50**		**0.38**	**0.50**		**0.38**
Larvae	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			--			--			--			x			x		
	Impair behavior/timing patterns	x			x			x			--			--			--			x			x		
	Physical harm or harassment	x			x			--			--			--			--			x			x		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.5	0.75	0.38	0	0.75	0.00	0	0.75	0.00	0	0.75	0.00	0.25	0.75	0.19	0.25	0.75	0.19
	Habitat level																								
	Air quality impairment (acute levels)	x			x			--			x			--			--			x			x		
	Water impairment (acute levels)	x			x			--			x			--			--			x			x		
	Sediment quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Permanent habitat destruction/displacement	0.5	0.75	0.38	0.75	0.75	0.56	0	1	0.00	0	1	0.00	0	1	0.00	0	1	0.00	0.5	0.75	0.38	0.5	0.75	0.38
	Permanently inaccessible habitat																								
	Assigned Effect Index Value	--			--			--			--			--			--			--			--		
	Indirect Effect	x			x			x			x			x			x			x			x		
	Habitat loss	--			--			--			--			--			--			x			x		
	Temporary destruction/displacement	x			x			x			x			x			x			x			x		
	Temporarily inaccessible	x			x			x			x			x			x			--			--		
	Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.5	0.25	0.5	0.5	0.25	0.5	0.5	0.25	0.5	0.25	0.13	0.5	0.75	0.38	0.5	0.75	0.38
	Habitat degradation																								
	Energy resource reduction																								
	Air quality impairment (chronic levels)	x			x			x			--			--			--			x			x		

	Effects and Pathways	Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
		EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
	Water quality impairment (chronic levels)	x			x			x			--			--			--			x			x		
	Sediment quality impairment (chronic levels)	0.25	1	0.25	0.25	1	0.25	0.25	1	0.25	0	1	0.00	0	1	0.00	0	1	0.00	0.25	1	0.25	0.25	1	0.25
	Reduction of structural habitat quality metrics																								
	Assigned Effect Index Value	x			x			x			x			x			x			x			x		
	Average Direct Effects	--			--			--			--			--			--			--			--		
	Average Effects Index	x			x			x			--			--			--			x			x		
	Magnitude of Effects	x			x			--			--			--			--			x			x		
Egg / Incubation	**Direct Effect**																								
	Species level																								
	Increased activity	x			x			x			--			--			--			--			--		
	Impair behavior/timing patterns	x			x			x			--			--			--			x			x		
	Physical harm or harassment	--			--			--			--			--			--			--			--		
	Assigned Effect Index Value	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38	0	1	0.00	0	1	0.00	0	1	0.00	0.5	0.75	0.38	0.5	0.75	0.38
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Water impairment (acute levels)	x			x			--			--			--			--			x			x		
	Sediment quality impairment (acute levels)	--			--			--			--			--			--			x			x		
	Permanent habitat destruction/displacement	x			x			x			x			x			x			x			x		
	Permanently inaccessible habitat	x			x			--			x			x			x			--			--		
	Assigned Effect Index Value	0.75	0.75	0.56	0.75	0.75	0.56	0.5	1	0.50	0.5	0.5	0.25	0.5	0.5	0.25	0.5	0.75	0.38	0.5	0.75	0.38	0.5	0.75	0.38
	Indirect Effect																								
	Habitat loss																								
	Temporary destruction/displacement	x			x			x			--			--			--			--			--		
	Temporarily inaccessible	x			x			x			--			--			--			--			--		
	Assigned Effect Index Value	0.5	1	0.50	0.25	1	0.25	0.25	1	0.25	0	1	0.00	0	1	0.00	0	1	0.00	0	1	0.00	0	1	0.00

	Effects and Pathways	Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
		EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
	Habitat degradation																								
	Energy resource reduction	--			--			--			--			--			--			x			x		
	Air quality impairment (chronic levels)	--			--			--			--			--			--			--			--		
	Water quality impairment (chronic levels)	x			x			x			--			--			--			x			x		
	Sediment quality impairment (chronic levels)	x			x			--			--			--			--			x			x		
	Reduction of structural habitat quality metrics	x			x			--			x			x			--			x			x		
	Assigned Effect Index Value	0.75	1	0.75	0.25	1	0.25	0.25	0.5	0.13	0.25	0.5	0.13	0.25	0.5	0.13	0	1	0.00	0.5	0.75	0.38	0.5	0.75	0.38
	Average Direct Effects	0.63		0.47	0.63		0.47	0.50		0.44	0.25		0.13	0.25		0.13	0.25		0.19	0.50		0.38	0.50		0.38
	Average Effects Index	0.63		0.55	0.44		0.36	0.38		0.31	0.19		0.09	0.19		0.09	0.13		0.09	0.38		0.28	0.38		0.28
	Magnitude of Effects	**0.63**		**0.55**	**0.63**		**0.47**	**0.50**		**0.44**	**0.25**		**0.13**	**0.25**		**0.13**	**0.25**		**0.19**	**0.50**		**0.38**	**0.50**		**0.38**

MARINE MAMMAL

Southern resident orca

		Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
	Effects and Pathways	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**	**EI**	**NCMI**	**AEI**
All	**Direct Effect**																								
	Species level																								
	Increased activity	--			--			--			--			--			--			x			x		
	Impair behavior/timing patterns	x			x			x			x			x			x			x			x		
	Physical harm or harassment	--			--			--			--			--			--			x			x		
	Assigned Effect Index Value	0.25	1	0.25	0	1	0.00	0	1	0.00	0	1	0.00	0	1	0.00	0.25	1	0.25	0.75	1	0.75	0.25	1	0.25
	Habitat level																								
	Air quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Water impairment (acute levels)	--			--			--			--			--			--			--			--		
	Sediment quality impairment (acute levels)	--			--			--			--			--			--			--			--		
	Permanent habitat destruction/displacement	x			x			x			x			x			x			--			x		
	Permanently inaccessible habitat	x			x			x			x			x			x			--			--		
	Assigned Effect Index Value	0.25	1	0.25	0	1	0.00	0	1	0.00	0	1	0.00	0	1	0.00	0.25	1	0.25	0	1	0.00	0	1	0.00
	Indirect Effect																								
	Habitat loss																								
	Temporary destruction/displacement	x			x			x			x			x			x			--			--		
	Temporarily inaccessible	x			x			x			x			x			x			x			x		
	Assigned Effect Index Value	0.25	1	0.25	0	1	0.00	0	1	0.00	0	1	0.00	0	1	0.00	0.25	1	0.25	0.5	1	0.50	0.25	1	0.25
	Habitat degradation																								
	Energy resource reduction	x			x			x			x			x			x			x			x		
	Air quality impairment (chronic levels)	--			--			--			--			--			--			--			--		
	Water quality impairment (chronic levels)	--			--			--			--			--			--			x			x		
	Sediment quality impairment (chronic levels)	--			--			--			--			--			--			--			--		

	Effects and Pathways	Single Element Structures																		Multiple Element Structures					
		Docks and Wharves			Boat ramps and Launches			Nearshore buildings			Mooring Buoys			Floats and Rafts			Floating homes			Marinas			Shipyards & Terminals		
		EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI	EI	NCMI	AEI
	Reduction of structural habitat quality metrics	x			x			x			x			x			x			x			x		
	Assigned Effect Index Value	0.25	1	0.25	0	1	0.00	0	1	0.00	0	1	0.00	0	1	0.00	0.25	1	0.25	0.25	1	0.25	0.25	1	0.25
	Average Direct Effects	0.25		0.25	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.25		0.25	0.38		0.38	0.13		0.13
	Average Effects Index	0.25		0.25	0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.25		0.25	0.38		0.38	0.19		0.19
	Magnitude of Effects	**0.25**		**0.25**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.25**		**0.25**	**0.38**		**0.38**	**0.19**		**0.19**

Appendix H – Percent of Species Habitat Occurring on State-owned Land Potentially Affected.

Covered Activities

Species	LifeStage	Potentially Affected Habitat (%)				
		Lacustrine	Riverine	Nearshore Marine	Offshore Marine	Total
Columbia spotted frog	Adult	0.10	0.01			0.08
	Egg	0.03	0.01			0.02
	Tadpole	0.05	0.01			0.04
Northern leopard frog	Adult	0.10	0.06			0.08
	Egg					
	Tadpole					
Western toad	Adult	0.08	1.16			0.23
	Egg	0.03	0.34			0.07
	Tadpole	0.05	0.63			0.13
Western pond turtle	Non-wintering	0.18				0.15
	Overwintering	0.05				0.04
Bald eagle	Non-nesting	1.42	1.63	1.20		0.54
	Nesting	2.65	2.40	1.60		0.84
Black tern	Migration	0.05	0.01			0.04
	Nesting	0.07	0.01			0.01
California brown pelican	Migration			1.24	<0.01	0.38
Common loon	Non-nesting	1.38	1.34	1.11	<0.01	0.51
	Nesting	1.63				0.23
Harlequin duck	Non-nesting		0.42	0.84		0.38
	Nesting	100.00	<0.01			0.02
Marbled murrelet	Nesting	8.40		1.58	<0.01	0.84
	Non-nesting	6.39		1.32	<0.01	0.68
Western snowy plover	Nesting			4.46		4.39
	Wintering			3.56		3.50
Bull trout/Dolly Varden	Adult	1.67	0.22	16.03		4.39
	Freshwater rearing/ Outmigration	2.43	0.32	1.73		0.73
	Incubation/ Emergence		0.01			<0.01

Species	LifeStage	Potentially Affected Habitat (%)				
		Lacustrine	Riverine	Nearshore Marine	Offshore Marine	Total
Chinook salmon	Adult	2.73	1.73	1.23		0.59
	Freshwater rearing/ Outmigration	4.03	2.44	1.73		0.85
	Incubation/ Emergence		0.50			0.02
Chum salmon	Adult		2.24	1.23	<0.01	0.42
	Freshwater rearing/ Outmigration		3.16	1.73		0.59
	Incubation/ Emergence		0.05			<0.01
Coastal cutthroat trout	Adult	10.06	2.33	1.23	<0.01	0.60
	Freshwater rearing/ Outmigration	14.39	3.30	1.73		0.84
	Incubation/ Emergence		0.66			0.02
Coho salmon	Adult	2.73	1.96	1.23	<0.01	0.56
	Freshwater rearing/ Outmigration	3.91	2.76	1.73		0.79
	Incubation/ Emergence		0.04			<0.01
Pink salmon	Adult		0.38	1.23	<0.01	0.38
	Freshwater rearing/ Outmigration		0.56	1.73		0.53
	Incubation/ Emergence		0.12			<0.01
Sockeye / Kokanee salmon	Adult	2.79	2.30	1.23	<0.01	0.61
	Freshwater rearing/ Outmigration	4.12	3.25	1.73		0.87
	Incubation/ Emergence	0.77	0.49			0.07
Steelhead trout	Adult	2.77	1.73	1.23	<0.01	0.59
	Freshwater rearing/ Outmigration	4.09	2.44	1.73		0.85
	Incubation/ Emergence		0.50			0.02

Species	LifeStage	Potentially Affected Habitat (%)				
		Lacustrine	Riverine	Nearshore Marine	Offshore Marine	Total
Green sturgeon	Adult		3.40	1.30	<0.01	0.43
White sturgeon	Juvenile/Adult	1.99	6.55	1.76	<0.01	0.76
	Larvae		6.79			0.09
	Eggs/Incubation		7.01			0.09
Southern resident orca	All			0.91	<0.01	0.25

Unauthorized Docks

Species	Lifestage	Potentially Affected Habitat (%)				
		Lacustrine	Riverine	Nearshore Marine	Offshore Marine	Total
Columbia spotted frog	Adult	0.02	0.01			0.01
	Egg	0.01	0.01			0.01
	Tadpole	0.01	0.01			0.01
Northern leopard frog	Adult	0.02	0.02			0.02
	Egg					
	Tadpole					
Western toad	Adult	0.04	0.02			0.02
	Egg	0.03	0.02			0.02
	Tadpole	0.03	0.02			0.02
Western pond turtle	Non-wintering	0.14				0.02
	Overwintering	0.11				0.02
Bald eagle	Non-nesting	0.26	0.01	0.00		0.06
	Nesting	0.40	0.01	0.00		0.09
Black tern	Migration	0.01	0.00			0.01
	Nesting	0.01	0.00			0.01
Brown pelican	Migration			0.16		0.08
Common loon	Non-nesting	0.39	0.01			0.09
	Nesting	0.50		0.00		0.07
Harlequin duck	Non-nesting					0.03
	Nesting	1.96	0.00	0.06		0.00
Marbled murrelet	Nesting	2.02		0.00		0.13
	Non-nesting	1.87		0.00		0.12
Western snowy plover	Nesting			0.00		0.01
	Wintering			0.00		0.01
Bull	Adult	0.62	0.02	0.00		0.13

		Potentially Affected Habitat (%)				
Species	**Lifestage**	**Lacustrine**	**Riverine**	**Nearshore Marine**	**Offshore Marine**	**Total**
trout/Dolly Varden	Freshwater rearing/ Outmigration	0.77	0.02			0.15
	Incubation/ Emergence		0.00	0.00		0.00
Chinook salmon	Adult	0.92	0.02	0.00		0.13
	Freshwater rearing/ Outmigration	1.13	0.02			0.15
	Incubation/ Emergence		0.02	0.00		0.00
Chum salmon	Adult		0.02	0.00		0.07
	Freshwater rearing/ Outmigration		0.02			0.07
	Incubation/ Emergence		0.00	0.00		0.00
Coastal cutthroat trout	Adult	4.16	0.02	0.00		0.14
	Freshwater rearing/ Outmigration	5.14	0.02			0.16
	Incubation/ Emergence		0.02	0.00		0.00
Coho salmon	Adult	1.13	0.02	0.00		0.13
	Freshwater rearing/ Outmigration	1.40	0.02			0.15
	Incubation/ Emergence		0.00	0.00		0.00
Pink salmon	Adult		0.04	0.00		0.07
	Freshwater rearing/ Outmigration		0.04			0.08
	Incubation/ Emergence		0.04	0.00		0.00
Sockeye/Kokaneee salmon	Adult	0.92	0.02	0.00		0.13
	Freshwater rearing/ Outmigration	1.14	0.02			0.16
	Incubation/ Emergence	0.52	0.02	0.00		0.04
Steelhead trout	Adult	0.93	0.02	0.00		0.13
	Freshwater rearing/ Outmigration	1.15	0.02			0.15

		Potentially Affected Habitat (%)				
Species	**Lifestage**	**Lacustrine**	**Riverine**	**Nearshore Marine**	**Offshore Marine**	**Total**
	Incubation/ Emergence		0.02	0.00		0.00
Green sturgeon	Adult		0.20	0.09		0.03
White sturgeon	Juvenile/Adult	0.32	0.01			0.06
	Larvae		0.00			0.00
	Eggs/Incubation	0.00	0.00	0.00		0.00
Southern resident orca	Resident			0.11		0.03

Appendix I – Potentially Affected Area by Activity and Species Lifestage..

Species	LifeStage	Potentially Affected Area (acres)													
		Aquaculture				Overwater Structures									
		Finfish	Shellfish	Total	Log booming	Boat ramps && Launches	Docks & Wharves	Floating homes	Mooring buoys	Nearshore buildings	Rafts & Floats	Marinas	Shipyards & Terminals	Total	Unauthorized Docks
Columbia spotted frog	Adult					< 1	6					213	< 1	220	35
	Egg					< 1	6					51	< 1	222	30
	Tadpole					< 1	6					111	< 1	117	32
	Average					< 1	6					125	< 1	186	33
Northern leopard frog	Adult					< 1	5					103		108	20
	Egg														
	Tadpole														
	Average					< 1	5					103		108	20
Western toad	Adult				75	13	32	5		48		785	472	1,356	154
	Egg				35	13	32			48		189	113	395	135
	Tadpole				35	13	32			48		408	246	747	142
	Average				48	13	32	5		48		461	277	833	144
Western pond turtle	Non-wintering				8	< 1	9	2		12		31	18	1,356	61
	Overwintering				0	< 1	9	2		12				24	47
	Average				8	< 1	9	2		12		31	18	690	59
Bald eagle	Non-nesting	41	2,406	2,447	734	7	243	25		26	2	9,669	2,648	12,619	1,797
	Nesting	41	2,406	2,447	2,899	7	246	25		26		15,321	3,486	19,110	2,483
	Average	41	2,406	2,447	1,817	7	244	25		26	2	12,495	3,067	15,865	2,140
Black tern	Migration					0	4		4			163	< 1	168	29
	Nesting					0	4		5			215	< 1	219	30
	Average					0	4		4			189	< 1	193	29
California brown pelican	Migration	56	2,406	2,461	758	6	222	< 1	17	17	< 1	4,715	423	5,401	1,123
Common loon	Non-nesting	37	37	2,443	1,479	8	468	49	54	29	7	8,523	1,743	10,881	2,687
	Nesting			0	1,379	< 1	354	70	36	13	6	4,011	883	5,372	2,085
	Average	37	37	2,443	1,429	4	411	60	45	21	6	6,267	1,313	8,127	2,386

Species	LifeStage	Potentially Affected Area (acres)													
		Aquaculture				Overwater Structures									
		Finfish	Shellfish	Total	Log booming	Boat ramps && Launches	Docks & Wharves	Floating homes	Mooring buoys	Nearshore buildings	Rafts & Floats	Marinas	Shipyards & Terminals	Total	Unauthorized Docks
Harlequin duck	Non-nesting			0	0	< 1						620		620	276
	Nesting			0	0					20		3,624		3,644	4
	Average			0	0	< 1				20		2,122		2,132	141
Marbled murrelet	Nesting	37	2,406	2,442	1,282	5	400	36	53	23	< 1	7,066	1,619	9,201	2,269
	Non-nesting	37	2,406	2,442	2,531	5	400	36	53	23	< 1	8,181	2,297	10,996	2,427
	Average	37	2,406	2,442	1,906	5	400	36	53	23	< 1	7,624	1,958	10,099	2,348
Western snowy plover	Nesting		4,098	4,098											13
	Wintering		3,264	3,264											13
	Average		3,681	3,681											13
Bull trout / Dolly Varden	Adult	41	2,406	2,446	869	4	709	48	26	26	< 1	7,701	1,637	10,151	3,350
	Juvenile	41	2,406	2,446	1,529	4	709	48	51	26	< 1	12,767	1,637	15,241	3,965
	Incubation/ Emergence	4		4		< 1	1							1	2
	Average	28	1,203	1,632	1,199	3	473	24	25	13	< 1	6,383	818	8,465	2,865
Chinook salmon	Adult	41	2,406	2,447	973	7	734	49	28	52	< 1	9,051	2,161	12,084	3,373
	Juvenile	41	2,406	2,447	1,701	7	734	49	51	52	2	15,006	2,161	18,062	3,988
	Incubation / Emergence	5		5	388	9	16	2	< 1	26				54	< 1
	Average	29	1,203	1,633	1,020	8	495	34	26	43	1	7,503	1,081	10,067	2,880
Chum salmon	Adult	41	2,406	2,447	628	7	348	3	9	43	< 1	5,528	1,067	7,005	1,553
	Juvenile	41	2,406	2,447	1,093	7	348	3	15	43	< 1	9,164	1,067	10,647	1,735
	Incubation / Emergence	4		4		6	< 1			23				54	2
	Average	29	1,203	1,633	861	7	232	1	7	37	< 1	4,582	533	5,902	1,227

Species	LifeStage	Potentially Affected Area (acres)													
		Aquaculture				Overwater Structures									
		Finfish	Shellfish	Total	Log booming	Boat ramps && Launches	Docks & Wharves	Floating homes	Mooring buoys	Nearshore buildings	Rafts & Floats	Marinas	Shipyards & Terminals	Total	Unauthorized Docks
Coastal cutthroat trout	Adult	41	2,406	2,447	973	7	703	49	28	52	< 1	7,851	2,161	10,851	3,290
	Juvenile	41	2,406	2,447	1,701	7	703	49	50	52	< 1	13,016	2,161	16,038	3,880
	Incubation / Emergence	5		5	388	8	6	2	< 1	26				43	12
	Average	29	1,203	1,633	1,020	8	471	34	26	43	< 1	6,508	1,080	8,977	2,803
Coho salmon	Adult	41	2,406	2,447	973	7	711	49	28	52	< 1	7,853	2,161	10,862	3,300
	Juvenile	41	2,406	2,447	1,701	7	711	49	51	52	< 1	13,020	2,161	16,051	3,890
	Incubation / Emergence	4		4		6	< 1			23				29	3
	Average	29	1,203	1,633	1,337	7	474	25	25	42	< 1	6,510	1,080	8,981	2,808
Pink salmon	Adult	37	2,406	2,442	527	4	345	1	9	17	< 1	4,755	541	5,673	1,552
	Juvenile	37	2,406	2,442	917	4	345	1	15	17	< 1	7,883	541	8,806	1,733
	Incubation / Emergence			0	19	3	9		< 1					12	10
	Average	18	1,203	2,442	488	4	233	< 1	8	9	< 1	3,942	270	4,830	1,228
Sockeye / Kokaneee salmon	Adult	41	2,406	2,446	940	4	734	49	28	29	< 1	9,045	2,161	12,052	3,346
	Juvenile	41	2,406	2,446	1,642	4	734	49	51	29	2	14,996	2,161	18,027	3,960
	Incubation / Emergence	4		4	1,322	3	397	48	19	12	< 1			480	1,021
	Average	28	1,203	1,632	1,301	4	622	49	32	23	1	7,498	1,081	10,186	3,201
Steelhead trout	Adult	41	2,406	2,447	973	7	734	49	28	52	< 1	9,051	2,161	12,084	3,373
	Juvenile	41	2,406	2,447	1,701	7	734	49	51	52	2	15,006	2,161	18,062	3,988
	Incubation / Emergence	5		5	388	9	16	2	< 1	26				54	15
	Average	29	1,203	1,633	1,020	8	495	34	26	43	< 1	7,503	1,081	10,067	2,885
Green sturgeon	Adult	25	3,927	3,952	484	1	97	< 1	4	< 1	5	2,736	396	3,239	303

Species	LifeStage	Potentially Affected Area (acres)													
		Aquaculture				Overwater Structures									
		Finfish	Shellfish	Total	Log booming	Boat ramps && Launches	Docks & Wharves	Floating homes	Mooring buoys	Nearshore buildings	Rafts & Floats	Marinas	Shipyards & Terminals	Total	Unauthorized Docks
White sturgeon	Juvenile / Adult	46	4,234	4,280	954	6	226	13	13	32	< 1	10,166	3,484	13,941	1,593
	Larvae	1	1,037	1	367	7	12	< 1	< 1	26		1,037	873	1,956	1
	Eggs / Incubation	1		1	309	7	9	< 1	< 1	13		1,037	873	1,941	1
	Average	16	518	1,427	543	7	82	5	5	24	< 1	4,080	1,743	5,946	1,249
Southern resident orca	Resident	37		37	252		106	< 1				4,715	310	5,130	667

Appendix J – Activity Specific Conservation Measures

Aquaculture conservation measures

[1] Mitigation measures are noted as AM; [2] Immediate impacts to a species or its habitat; [3] Delayed or chronic impacts to species; [4] From NOAA Essential Fish Habitat

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
A1	Restrict noise and light to harvesting activities, normal operational practices and/or maintenance of safety. [4]	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Increased activity ▪ Impair behavior/timing patterns ▪ Physical harm or harassment	
A2	Make every reasonable effort to minimize noise and lights during nighttime operations. [4]	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Increased activity ▪ Impair behavior/timing patterns ▪ Physical harm or harassment	
A3	Use durable long life materials for site construction (i.e. wrapped styrofoam).	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Water impairment ▪ Physical harm or harassment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
A4	Minimize/prevent wheeled vehicles from driving on/in intertidal areas (e.g. eelgrass beds salt marsh). [4]	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Water impairment ▪ Sediment quality impairment ▪ Permanent habitat destruction/displacement ▪ Physical harm or harassment	▪ Air quality impairment (chronic) ▪ Water quality impairment (chronic)
A5	Prevent release of contaminants from equipment into the environment. [4]	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Air quality impairment ▪ Water impairment ▪ Sediment quality impairment	▪ Air quality impairment (chronic) ▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
A6	Prevent use or discharge of toxic chemicals to control the fouling of nets. [4]	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
A7	Prevent discharge of sanitary waste.	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
A8	Prevent pressure washing or cleaning of machinery in intertidal habitats. [4]	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
A9	Minimize the risk of spills from vessels and equipment through appropriate design employing appropriate containment devices (such as drip pans) and ensuring prompt cleanup of all spills and leaks. [4]	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Water impairment ▪ Sediment quality impairment	
A10	Store all chemicals fuels and lubricants off site. [4]	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Water impairment ▪ Sediment quality impairment	
A11	Recover and dispose all debris and garbage at an appropriate upland facility. [4]	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Water impairment ▪ Sediment quality impairment	
A12	Develop and follow a Best Management Plan (BMP) for sewage and liquid waste that addresses: toilet facilities; handling and discharge of graywater; transportation and disposal of sewage and liquid waste. [4]	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
A13	Develop and maintain a spill response kit with appropriate equipment information for notification of authorities and a training plan for employees. Amend the plan whenever operational practices are altered. [4]	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Water impairment ▪ Sediment quality impairment	
A14	Follow practices that minimize the buildup of released biofouling organisms onto benthic environments. [4]	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens		▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic) ▪ Reduction of structural habitat quality
A15	Minimize the discharge of unconsumed food.	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
A16	Minimize the discharge of accumulated solids and attached marine growth.	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
A17	Minimize harvest/culture where seagrasses or kelp are present.	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Permanent habitat destruction/displacement	▪ Reduction of structural habitat quality
A18	Prevent damage/destruction of covered species or their habitats in the harvest/culture area. [4]	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Permanent habitat destruction/displacement	
A19	Prevent harvest or in water maintenance construction during Covered Species migration windows.	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Increased activity ▪ Impair behavior/timing patterns ▪ Physical harm or harassment	

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
A20	Develop and maintain a disease diagnosis and response plan documenting import and transfer requirements as well as procedures for stock certification; disease containment and eradication; and control chemical use. [4]	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Physical harm or harassment	
A21	Disallow commercial harvesting in areas with densities of native hard shell clams less than 2.7 per square meter or geoduck clam densities less than 0.2 per square meter.	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Physical harm or harassment ▪ Permanent habitat destruction/displacement	
A22	Ensure net pen structures have webbing of appropriate size to prevent entanglement by Covered Species and their prey.	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Physical harm or harassment	
A23	Ensure predator netting is of appropriate size to avoid entrapment and injury to Covered Species and their prey and made of (biodegradable?) material that is tightly secured and regularly inspected. [4]	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Physical harm or harassment	
AM1	Avoid culture operations in/over fine sediments.	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Permanent habitat destruction/displacement	▪ Energy resource reduction ▪ Reduction of structural habitat quality

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
AM2	Do not issue leases for new additional fish farms or at least impose a moratorium until the carrying capacity for such facilities can be established.	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Permanent habitat destruction/displacement	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
AM3	Tidally influenced wetlands should not be enclosed or impounded for aquaculture purposes including hatchery and grow-out operations. Siting of facilities should also take into account the size of the facility proximity of wild fish stocks migratory patterns competing uses hydrographic conditions and upstream uses. [4]	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Permanent habitat destruction/displacement	▪ Reduction of structural habitat quality
AM4	Site operations away from subaquatic vegetation area.	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Permanent habitat destruction/displacement	▪ Reduction of structural habitat quality
AM5	All facilities must be located a minimum of 457 meters from bird and mammalian habitats of special significance and areas identified as critical for feeding or migration of birds or mammals. [4]	▪ Shellfish ▪ Netpens	▪ Shellfish ▪ Netpens	▪ Permanent habitat destruction/displacement	▪ Reduction of structural habitat quality
AM6	Identify protected areas which might be sensitive habitat or bird habitat where shellfish aquaculture should be prohibited.	▪ Shellfish	▪ Shellfish	▪ Increased activity ▪ Impair behavior/timing patterns ▪ Physical harm or harassment ▪ Permanent habitat destruction/displacement	▪ Reduction of structural habitat quality

Log Booming and Storage Conservation Measures

[1] Mitigation measures are noted as AM; [2] Immediate impacts to a species or its habitat; [3] Delayed or chronic impacts to species; [4] From NOAA Essential Fish Habitat

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
LB1	Site log transfer facilities to avoid bald eagle nests. No project construction or operation should be closer than 330 feet to any bald eagle nest tree unless permitted by U.S. Fish and Wildlife Service.	Yes	Yes	▪ Impair behavior/timing patterns ▪ Physical harm or harassment ▪ Permanent habitat destruction/displacement	▪ Reduction of structural habitat quality
LB2	Site log storage areas and LTFs in areas with good currents and tidal exchanges.[4]	Yes	Yes	▪ Water impairment ▪ Sediment quality impairment ▪ Permanent habitat destruction/displacement	▪ Reduction of structural habitat quality
LB3	Storage of logs should not take place where they will ground at any time .[4]	Yes	Yes	▪ Permanent habitat destruction/displacement	▪ Energy resource reduction ▪ Reduction of structural habitat quality
LB4	Storage and handling of logs should be restricted or eliminated from waters where state and federal water quality and sediment standards cannot be met at all times.[4]	Yes	Yes	▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
LB5	Avoid siting log storage areas and facilities in sensitive habitat and areas important for specified species (e.g. salt marshes, kelp or eelgrass beds, seaweed harvest areas or shellfish concentration	Yes	Yes	▪ Permanent habitat destruction/displacement Physical harm or harassment	▪ Reduction of structural habitat quality

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
	areas).[4]				

Overwater Structures Conservation Measures

[1] Mitigation measures are noted as AM; [2] Immediate impacts to a species or its habitat; [3] Delayed or chronic impacts to species; [4] From NOAA Essential Fish Habitat

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
OS1	Deploy anchorage systems in a manner that prevents dragging.	▪ Mooring Buoys	▪ Boat Ramp ▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings ▪ Docks/Wharves ▪ Mooring Buoys	▪ Water impairment ▪ Permanent habitat destruction / displacement	▪ Reduction of structural habitat quality
OS2	No large woody debris may be removed during construction of operation.	▪ Boat Ramp ▪ Rafts/Floats ▪ Nearshore Buildings ▪ Docks/Wharves		▪ Permanent habitat destruction / displacement ▪ Physical harm or harassment	▪ Reduction of structural habitat quality
OS3	Avoid casting artificial light into the ambient night-time aquatic environment and orient night lighting such that illumination of the surrounding waters is avoided.	▪ Boat Ramp ▪ Rafts/Floats ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Rafts/Floats ▪ Floating Homes ▪ Docks/Wharves ▪ Boat Ramp ▪ Nearshore Buildings	▪ Permanent habitat destruction / displacement ▪ Physical harm or harassment	▪ Temporary destruction / displacement

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
OS4	Floats shall not rest on the tidal substrate and must use stoppers or supports that keep the bottom of the floatation device at least 1 (one) foot above the level of the substrate.		▪ Rafts/Floats	▪ Permanent habitat destruction / displacement	▪ Reduction of structural habitat quality
OS5	Require subsurface float to prevent the line from dragging on the bottom during low water.	▪ Mooring Buoys	▪ Rafts/Floats ▪ Mooring Buoys	▪ Permanent habitat destruction / displacement	▪ Reduction of structural habitat quality
OS6	Cover Styrofoam floatation material so Styrofoam can't escape throughout the useable life of the float.	▪ Boat Ramp ▪ Rafts/Floats ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Rafts/Floats	▪ Water impairment ▪ Sediment quality impairment ▪ Physical harm or harassment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
OS7	Perform maintenance activities using environmental windows that protect spawning periods and periods of presence of covered species.	▪ Boat Ramp ▪ Rafts/Floats ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Boat Ramp ▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Impair behavior/timing patterns ▪ Physical harm or harassment	▪ Temporary destruction / displacement
OS8	Incorporate measures that increase the ambient light transmission under piers and docks during daylight hours. These measures include, but are not limited to, maximizing the height of the structure and minimizing the width of the structure to decrease shade footprint; grated decking material; using solar tubes to direct light under the structure and glass blocks to direct sunlight under the structure; illuminating the under structure area with metal halide lamps and use of reflective paint or materials (e.g., concrete or steel instead of materials that absorb light		▪ Rafts/Floats ▪ Docks/Wharves ▪ Marinas ▪ Shipyards and Terminals	▪ Impair behavior / timing patterns ▪ Physical harm or harassment ▪ Permanent habitat destruction / displacement	▪ Energy resource reduction ▪ Reduction of structural habitat quality

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
	such as wood) on the underside of the dock to reflect ambient light; using the fewest number of pilings necessary to support the structures to allow light into under-pier areas and minimize impacts to the substrate; and aligning piers, docks and floats in north-south orientation to allow arc of sun to cross perpendicular to structure and reduce duration of light limitation.[4]				
OS9	Remove existing skirting and do not authorize for maintenance activities.		▪ Boat Ramp ▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Permanent habitat destruction / displacement	▪ Reduction of structural habitat quality
OS10	Prevent work over or in close proximity to submerged vegetation.	▪ Boat Ramp ▪ Rafts/Floats ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Boat Ramp ▪ Rafts/Floats ▪ Floating Homes ▪ Docks/Wharves	▪ Permanent habitat destruction / displacement ▪ Impair behavior / timing patterns ▪ Physical harm or harassment	▪ Reduction of structural habitat quality
OS11	Situate buoys so that vessels do not ground out at low water.	▪ Mooring Buoys	▪ Mooring Buoys	▪ Permanent habitat destruction / displacement	▪ Reduction of structural habitat quality
OS12	Ensure that the length of mooring lines between the anchor and the subsurface float exceed the water depth as measured at extreme high tide plus 20 percent.	▪ Mooring Buoys	▪ Mooring Buoys	▪ Permanent habitat destruction / displacement	▪ Reduction of structural habitat quality

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
OS13	Use materials such as steel, concrete, recycled plastic, anchors and elastic rods or alternative dock mooring systems when replacing structure parts during maintenance.	▪ Marinas ▪ Shipyards and Terminals	▪ Marinas ▪ Shipyards and Terminals	▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
OS14	Place shallow draft vessels nearshore to avoid the need for dredging.	▪ Marinas ▪ Shipyards and Terminals	▪ Marinas ▪ Shipyards and Terminals	▪ Permanent habitat destruction / displacement	▪ Reduction of structural habitat quality
OS15	Maintain dredged basins with more than one water depth so that depth decreases with distance from the entrance to avoid internal deeper pockets that can act as unflushed holding basins.		▪ Marinas ▪ Shipyards and Terminals	▪ Water impairment ▪ Sediment quality impairment ▪ Permanent habitat destruction / displacement	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic) ▪ Reduction of structural habitat quality
OS16	Do not allow new, additional filling of lands.	▪ Marinas Shipyards and Terminals	▪ Marinas	▪ Permanent habitat destruction / displacement	▪ Reduction of structural habitat quality
OS17	Locate floats in deep water to avoid light limitation and grounding impacts and maintain at least one foot of water between the substrate and the bottom of the float.[4]	▪ Boat Ramp ▪ Rafts/Floats ▪ Nearshore Buildings ▪ Docks/Wharves ▪ Marinas ▪ Shipyards and Terminals	▪ Boat Ramp ▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings ▪ Docks/Wharves ▪ Marinas ▪ Shipyards and Terminals	▪ Permanent habitat destruction / displacement, ▪ Physical harm or harassment	▪ Energy resource reduction ▪ Reduction of structural habitat quality
OS18	Orient night lighting such that illumination of the surrounding waters is avoided.[4]	▪ Marinas ▪ Shipyards and Terminals	▪ Marinas ▪ Shipyards and Terminals	▪ Impair behavior / timing patterns	

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
OS19	Incorporate best management practices to prevent or minimize contamination from ship bilge waters, antifouling paints, shipboard accidents, shipyard work, maintenance dredging and disposal, and nonpoint source contaminants from upland facilities related to vessel operations and navigation.[4]			▪ Impair behavior / timing patterns ▪ Physical harm or harassment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
OS20	Use upland boat storage whenever possible to minimize need for overwater structures.[4]	▪ Marinas ▪ Shipyards and Terminals	▪ Marinas ▪ Shipyards and Terminals	▪ Permanent habitat destruction / displacement	▪ Reduction of structural habitat quality
OS21	Include low-wake vessel technology, appropriate routes, and best management practices for wave attenuation structures as part of the design and permit process. Vessels should be operated at sufficiently low speeds to reduce wake energy, and no-wake zones should be designated near sensitive habitats.[4]		▪ Marinas ▪ Shipyards and Terminals	▪ Permanent habitat destruction / displacement	▪ Reduction of structural habitat quality
OS22	Encourage only seasonal use of docks and off-season haul-outs.		▪ Marinas	▪ Impair behavior / timing patterns ▪ Permanent habitat destruction / displacement	
OS23	Use environmental windows for any maintenance activities (and operations to the extent possible) that include protection for spawning periods and periods of presence of juvenile salmonids, forage fish, groundfish, and Dungeness crab .		▪ Marinas ▪ Shipyards and Terminals	▪ Increased activity ▪ Impair behavior / timing patterns ▪ Physical harm or harassment	

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
OS24	Minimize changes to natural sediment processes and avoid effects to wave energy that determine characteristics of adjacent habitats.	▪ Boat Ramp ▪ Nearshore Buildings ▪ Docks/Wharves ▪ Marinas	▪ Boat Ramp ▪ Floating Homes ▪ Nearshore Buildings ▪ Docks/Wharves ▪ Marinas ▪ Shipyards and Terminals	▪ Impair behavior / timing patterns ▪ Permanent habitat destruction / displacement ▪ Physical harm or harassment	▪ Reduction of structural habitat quality
OS25	Assess water drainage and runoff patterns and alter them to reduce direct inputs.		▪ Marinas ▪ Shipyards and Terminals	▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
OS26	Avoid use of treated wood timbers or pilings to the extent practicable. Use of alternative materials such as untreated wood, concrete, or steel is recommended.[4]	▪ Boat Ramp ▪ Rafts/Floats ▪ Nearshore Buildings ▪ Docks/Wharves ▪ Marinas ▪ Shipyards and Terminals	▪ Boat Ramp ▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings ▪ Docks/Wharves ▪ Marinas ▪ Shipyards and Terminals	▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
OS27	Ammoniacal Copper Quaternary (ACQ) treated wood may not be used in marine environments Require replacement on existing structures within 10 years.	▪ Marinas ▪ Shipyards and Terminals		▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
OSM1	Place marinas in natural deepwater areas to minimize or preclude dredging and grounding.	▪ Marinas ▪ Shipyards and Terminals	▪ Marinas	▪ Permanent habitat destruction / displacement	▪ Reduction of structural habitat quality

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
OSM2	Metal-salt treated wood should not be used in conditions of low water hardness, low pH, where elevated background metals exist, or where metals-sensitive biota, such as shellfish, is prevalent. Require replacement on existing structures within 10 years.	▪ Marinas ▪ Shipyards and Terminals	▪ Marinas ▪ Shipyards and Terminals	▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
OSM3	Creosote-treated wood should not be used in locations with anaerobic sediments with low total organic carbon or elevated polyaromatic hydrocarbons (PAH) levels.	▪ Marinas ▪ Shipyards and Terminals	▪ Marinas ▪ Shipyards and Terminals	▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
OSM4	Identify and protect eelgrass beds at risk from terminal activities.	▪ Marinas ▪ Shipyards and Terminals	▪ Shipyards and Terminals		▪ Reduction of structural habitat quality
OSM5	Use construction and dredging work schedules to avoid fish spawning, migration, and rearing impacts.	▪ Marinas ▪ Shipyards and Terminals	▪ Marinas ▪ Shipyards and Terminals	▪ Impair behavior / timing patterns ▪ Physical harm or harassment	
OSM6	Build in fish passageways to allow fish in and out of existing marinas.		▪ Marinas	▪ Impair behavior / timing patterns ▪ Permanently inaccessible habitat	
OSM7	Orient the basin entrance to provide for maximum tidal flushing and prevailing current water exchange.		▪ Marinas ▪ Shipyards and Terminals	▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
OSM8	Provide two entrances as practicable to provide for maximum flushing action to improve water quality and facilitate fish access to migratory corridor.		▪ Marinas ▪ Shipyards and Terminals	▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
OSM9	Locate facilities in areas with sufficient water velocities to dissipate fuels and pollutants from vessels and maintain temperature and dissolved oxygen levels within acceptable ranges.[4]		▪ Marinas ▪ Shipyards and Terminals	▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
OSM10	Avoid the disturbance of beds, mudflats and wetlands as part of the project design.[4]	▪ Marinas ▪ Shipyards and Terminals	▪ Marinas	▪ Permanent habitat destruction / displacement	▪ Reduction of structural habitat quality
OSM11	Locate marinas in areas of low biological abundance and diversity, avoiding dense beds of eelgrass or other submerged aquatic vegetation including macroalgae.[4]	▪ Marinas ▪ Shipyards and Terminals	▪ Marinas	▪ Permanent habitat destruction / displacement	▪ Reduction of structural habitat quality
OSM12	Design marinas to retain as much existing natural aquatic and marginal vegetation as possible.		▪ Marinas ▪ Shipyards and Terminals	▪ Permanent habitat destruction / displacement	▪ Reduction of structural habitat quality
OSM13	Use floating breakwaters whenever possible and remove them during periods of low dock use.[4]		▪ Marinas ▪ Shipyards and Terminals	▪ Permanent habitat destruction / displacement	
OSM14	Utilize floating breakwaters or wave boards as opposed to traditional fixed rubble mound breakwaters.		▪ Boat Ramp ▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings	▪ Impair behavior / timing patterns ▪ Permanent habitat destruction / displacement ▪ Permanently inaccessible habitat	▪ Reduction of structural habitat quality,

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
OSM15	Extend walkway portion of the pier to position floats in deepwater to avoid intertidal and shade effects.	▪ Boat Ramp Rafts/Floats Nearshore Buildings Docks/Wharves	▪ Boat Ramp Rafts/Floats Floating Homes Nearshore Buildings Docks/Wharves	▪ Impair behavior / timing patterns ▪ Permanent habitat destruction / displacement ▪ Physical harm or harassment	▪ Energy resource reduction ▪ Reduction of structural habitat quality
OSM16	Locate overwater structures in sufficiently deep waters to avoid intertidal and shade impacts, to minimize or preclude dredging, to minimize groundings, and to avoid displacement of submerged aquatic vegetation, as determined by a pre-construction survey.[4]	▪ Boat Ramp ▪ Rafts/Floats ▪ Nearshore Buildings ▪ Docks/Wharves ▪ Marinas ▪ Shipyards and Terminals	▪ Boat Ramp ▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings ▪ Docks/Wharves ▪ Shipyards and Terminals	▪ Impair behavior / timing patterns ▪ Physical harm or harassment ▪ Permanent habitat destruction / displacement	▪ Energy resource reduction ▪ Reduction of structural habitat quality
OSM17	Fingers and ells must not exceed than 6-foot wide by 20-foot long with a 2-foot wide strip of grating down the center OR 6-foot wide by 26-foot long and fully grated. (freshwater)		▪ Boat Ramp ▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Impair behavior / timing patterns ▪ Permanent habitat destruction / displacement	▪ Energy resource reduction ▪ Reduction of structural habitat quality
OSM18	Float widths greater than 6 feet shall have grating on at least 50% of the surface.		▪ Rafts/Floats	▪ Permanent habitat destruction / displacement	▪ Energy resource reduction
OSM19	Float widths of less than 6 feet shall have grating on at least 30% of surface.		▪ Rafts/Floats	▪ Permanent habitat destruction / displacement	▪ Energy resource reduction
OSM20	Grating must have at least 60% open area .		▪ Rafts/Floats Docks/Wharves	▪ Permanent habitat destruction / displacement	▪ Energy resource reduction (reduces shading impacts to food supply)
OSM21	Limit the maximum size of the float to decrease shadow area .		▪ Rafts/Floats	▪ Permanent habitat destruction / displacement	▪ Energy resource reduction

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
OSM22	Limit the width of the walkway portion to 4 feet .		▪ Boat Ramp ▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Permanent habitat destruction / displacement	▪ Energy resource reduction ▪ Reduction of structural habitat quality
OSM23	Use a vibratory hammer when driving hollow steel piles. Under those conditions where impact hammers are required for reasons of seismic stability or substrate type, it is recommended that the pile be driven as deep as possible with a vibratory hammer prior to the use of the impact hammer.[4]	▪ Boat Ramp ▪ Rafts/Floats ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Boat Ramp ▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings ▪ Docks/Wharves ▪ Marinas ▪ Shipyards and Terminals	▪ Increased activity ▪ Impair behavior / timing patterns ▪ Physical harm or harassment	▪ Temporary destruction / displacement
OSM24	Remove piles completely rather than cutting or breaking off if the pile is structurally sound. [4]	▪ Marinas ▪ Shipyards and Terminals	▪ Marinas ▪ Shipyards and Terminals	▪ Permanent habitat destruction / displacement	
OSM25	Except for floats, the bottom of all structures must be at least 1.5 feet above OHW .	▪ Boat Ramp ▪ Rafts/Floats ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Boat Ramp ▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Permanent habitat destruction / displacement	▪ Reduction of structural habitat quality
OSM26	Place floats in deep water, at minimum depth of 4 feet at ELLW or OLW to avoid light limitation and grounding effects .	▪ Rafts/Floats	▪ Rafts/Floats	▪ Permanent habitat destruction / displacement	▪ Energy resource reduction ▪ Reduction of structural habitat quality
OSM27	Place breakwaters parallel rather than perpendicular to the shore .		▪ Boat Ramp ▪ Rafts/Floats ▪ Floating Homes ▪ Docks/Wharves ▪ Marinas ▪ Shipyards and Terminals	▪ Impair behavior / timing patterns ▪ Permanent habitat destruction / displacement ▪ Permanently inaccessible habitat	▪ Energy resource reduction ▪ Reduction of structural habitat quality

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
OSM28	Wherever possible, floats shall be aligned in a north-south orientation to allow the arc of the sun to cross perpendicular to float to reduce light limitation .		▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings Docks/Wharves	▪ Permanent habitat destruction / displacement	▪ Energy resource reduction
OSM29	Creosote-treated timber piles should be cut into short lengths to prevent reuse, and all debris, including attached, contaminated sediments, should be disposed of in an approved upland facility.[4]	▪ Boat Ramp ▪ Rafts/Floats ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Boat Ramp ▪ Rafts/Floats ▪ Floating Homes ▪ Docks/Wharves ▪ Marinas ▪ Shipyards and Terminals	▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
OSM30	No Ammoniacal Copper Quaternary (ACQ) treated wood in marine waters .	▪ Boat Ramp ▪ Rafts/Floats ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Docks/Wharves	▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
OSM31	Locate new structures or activities away from submerged / emergent vegetation, macro algae species and / or seagrass.	▪ Boat Ramp ▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings ▪ Docks/Wharves ▪ Mooring Buoys	▪ Boat Ramp ▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings ▪ Docks/Wharves ▪ Mooring Buoys	▪ Permanent habitat destruction / displacement ▪ Physical harm or harassment	▪ Reduction of structural habitat quality
OSM32	Limit density of mooring buoys to 4 per acre.	▪ Mooring Buoys	▪ Mooring Buoys	▪ Permanent habitat destruction / displacement ▪ Permanently inaccessible habitat	▪ Reduction of structural habitat quality

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
OSM33	Drive piles when the current is reduced (i.e., centered around slack current) in areas of strong current to minimize the number of fish and marine mammals exposed to adverse levels of underwater sound.[4]	▪ Boat Ramp ▪ Rafts/Floats ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Boat Ramp ▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Impair behavior / timing patterns ▪ Physical harm or harassment	▪ Temporary destruction / displacement
OSM34	Minimize the suspension of sediments and disturbance of the substrate when removing piles. Measures to help accomplish this include, but are not limited to, the following: removing piles with a vibratory hammer, rather than the direct pull or clamshell method; Remove the pile slowly to allow sediment to slough off at, or near, the mudline; hitting or vibrating the pile to break the bond between the sediment and pile to minimize the potential for the pile to break and resuspension of sediment; Place a ring of clean sand around the base of the pile. Encircle the pile, or piles, with a silt curtain that extends from the surface of the water to the substrate.[4]		▪ Marinas ▪ Shipyards and Terminals	▪ Impair behavior / timing patterns ▪ Water impairment ▪ Sediment quality impairment ▪ Physical harm or harassment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
OSM35	Install hollow steel piles with an impact hammer at a time of year when larval and juvenile stages of fish species are not present.[4]		▪ Boat Ramps ▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Physical harm or harassment	▪ Temporary destruction / displacement ▪ Impair behavior / timing patterns ▪ Physical harm or harassment

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
OSM36	Use anchors instead of pilings, whenever possible. Use the fewest number of pilings necessary, to allow light into under-pier areas.	▪ Marinas ▪ Shipyards and Terminals	▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings ▪ Docks/Wharves ▪ Marinas ▪ Shipyards and Terminals	▪ Water impairment ▪ Sediment quality impairment ▪ Permanent habitat destruction / displacement ▪ Physical harm or harassment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic) ▪ Reduction of structural habitat quality
OSM37	Orient floats with currents or prevailing winds to prevent trapping surface debris and oily residue.		▪ Boat Ramp Rafts/Floats Floating Homes Nearshore Buildings ▪ Docks/Wharves	▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
OSM38	Design piers, docks, and floats to be multi-use facilities in order to reduce the overall number of such structures and the nearshore habitat that is impacted.4	▪ Boat Ramp ▪ Rafts/Floats ▪ Docks/Wharves	▪ Boat Ramp ▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Increased activity ▪ Air quality impairment ▪ Water impairment ▪ Sediment quality impairment ▪ Permanent habitat destruction / displacement ▪ Permanently inaccessible habitat ▪ Physical harm or harassment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic) ▪ Reduction of structural habitat quality

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
OSM39	Require joint-use docks to reduce cumulative effects.	▪ Boat Ramp ▪ Rafts/Floats ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Boat Ramp ▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Increased activity ▪ Air quality impairment ▪ Water impairment ▪ Sediment quality impairment ▪ Permanent habitat destruction / displacement ▪ Physical harm or harassment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic) ▪ Reduction of structural habitat quality
OSM40	Implement sound attenuation measures for pile driving including: air bubble curtain system or air-filled coffer dam.; use of a smaller hammer; and hydraulic hammers if impact driving cannot be avoided. [4]		▪ Marinas ▪ Shipyards and Terminals	▪ Impair behavior / timing patterns ▪ Physical harm or harassment	
OSM41	Locate marinas where they do not interfere with drift sectors determining the structure and function of adjacent habitats.[4]	▪ Marinas ▪ Shipyards and Terminals	▪ Marinas	▪ Permanent habitat destruction / displacement	▪ Reduction of structural habitat quality
OSM42	Use bubble curtains or padding to break up shock waves when blasting or pile driving.		▪ Shipyards and Terminals	▪ Impair behavior / timing patterns ▪ Physical harm or harassment	
OSM43	Avoid construction of mooring basins in blind channels or sloughs where there is insufficient tidal current or natural flow to ensure adequate and regular flushing.	▪ Marinas ▪ Shipyards and Terminals	▪ Marinas	▪ Impair behavior / timing patterns ▪ Water impairment ▪ Sediment quality impairment	▪ Water quality impairment (chronic) ▪ Sediment quality impairment (chronic)
OSM44	The float will be installed in a north-south direction.		▪ Rafts/Floats ▪ Floating Homes ▪ Nearshore Buildings ▪ Docks/Wharves	▪ Permanent habitat destruction / displacement ▪ Impair behavior / timing patterns	

Number[1]	Conservation Measure	Applicable For		Risks Likely Reduced by Conservation Measure	
		Avoidance	Minimization	Direct Effect[2]	Indirect Effect[3]
OSM45	Use the fewest number of pilings necessary, to allow natural light under piers.	▪ Marinas ▪ Shipyards and Terminals	▪ Shipyards and Terminals	▪ Permanent habitat destruction / displacement	▪ Reduction of structural habitat quality

Appendix K –Reduction in Potentially Affected Area with Conservation Measures.

Species	Lifestage	Percent Decrease in Potentially Affected Area with Conservation Measures										
		Aquaculture			Overwater Structures							
					Single Element						Multiple Element	
		Finfish	Shellfish	Log booming	Boat ramps & Launches	Docks & Wharves	Floating homes	Mooring buoys	Nearshore buildings	Rafts & Floats	Marinas	Shipyards & Terminals
Columbia spotted frog	Adult				12	12					12	12
	Egg				12	12					17	17
	Tadpole				25	25					31	31
	Average				16	16					20	20
Northern leopard frog	Adult				12	12					12	
	Egg											
	Tadpole											
	Average				12	12					12	
Western toad	Adult				12	12	24		20		12	12
	Egg			50	12	12			14		17	17
	Tadpole			50	25	25			25		31	31
	Average			33	16	16	24		20		20	20
Western pond turtle	Non-wintering			31	12	12	24		20		0	
	Overwintering				12	12	24		20			
	Average			31	12	12	24		20		0	

Species	Lifestage	Percent Decrease in Potentially Affected Area with Conservation Measures										
		Aquaculture		Log booming	Overwater Structures							
					Single Element						Multiple Element	
		Finfish	Shellfish		Boat ramps & Launches	Docks & Wharves	Floating homes	Mooring buoys	Nearshore buildings	Rafts & Floats	Marinas	Shipyards & Terminals
Bald eagle	Non-nesting	20	20	16	12	12	12		12	12	18	18
	Nesting	20	20	25	12	12	12		12		24	24
	Average	20	20	21	12	12	12		12	12	21	21
Black tern	Migration				16	16		31			16	16
	Nesting				16	16		12			20	16
	Average				16	16		21			18	16
California brown pelican	Migration	26	20	26	12	12	12	12	12	12	21	20
Common loon	Non-nesting	20	20	26	12	12	12	12	12	12	19	20
	Nesting			50	12	12	12	12	12	12	19	20
	Average	20	20	38	12	12	12	12	12	12	19	20
Harlequin duck	Non-nesting				12						18	
	Nesting								16		18	
	Average				12				16		18	
Marbled murrelet	Nesting	20	20	26	18	18	11		18		18	13
	Non-nesting	20	20	49	18	18	11		18		18	18
	Average	20	20	38	18	18	11		18		18	16

Species	Lifestage	Percent Decrease in Potentially Affected Area with Conservation Measures										
		Aquaculture		Log booming	Overwater Structures							
					Single Element						Multiple Element	
		Finfish	Shellfish		Boat ramps & Launches	Docks & Wharves	Floating homes	Mooring buoys	Nearshore buildings	Rafts & Floats	Marinas	Shipyards & Terminals
Western snowy plover	Nesting		25									
	Wintering		18									
	Average		22									
Bull trout/Dolly Varden	Adult	12	12	24	12	12	12	31	12	31	11	13
	Juvenile	12	12	23	24	25	24	24	24	24	17	19
	Incubation / Emergence											
	Average	8	6	11	12	12	12	12	12	12	9	10
Chinook salmon	Adult	12	12	24	12	12	12	31	12	31	11	13
	Juvenile	12	12	23	24	25	24	24	24	24	17	19
	Incubation / Emergence											
	Average	8	6	16	12	12	12	18	12	12	9	10
Chum salmon	Adult	12	12	24	12	12	12	31	12	31	11	13
	Juvenile	12	12	23	24	25	24	24	24	24	17	19
	Incubation / Emergence											
	Average	8	6	11	12	12	12	12	12	12	9	10

Species	Lifestage	Percent Decrease in Potentially Affected Area with Conservation Measures										
		Aquaculture		Log booming	Overwater Structures							
					Single Element						Multiple Element	
		Finfish	Shellfish		Boat ramps & Launches	Docks & Wharves	Floating homes	Mooring buoys	Nearshore buildings	Rafts & Floats	Marinas	Shipyards & Terminals
Coastal cutthroat trout	Adult	12	12	24	12	12	12	31	12	31	11	13
	Juvenile	12	12	23	24	25	24	24	24	24	17	19
	Incubation / Emergence											
	Average	8	6	16	12	12	12	18	12	12	9	10
Coho salmon	Adult	12	12	24	12	12	12	31	12	31	11	13
	Juvenile	12	12	23	24	25	24	24	24	24	17	19
	Incubation / Emergence											
	Average	8	6	11	12	12	12	12	12	12	9	10
Pink salmon	Adult	12	12	24	12	13	12	31	12	31	11	13
	Juvenile	12	12	23	24	25	24	24	24	24	17	19
	Incubation / Emergence											
	Average	6	6	16	12	13	12	18	12	12	9	10

Species	Lifestage	Percent Decrease in Potentially Affected Area with Conservation Measures										
		Aquaculture		Log booming	Overwater Structures							
					Single Element						Multiple Element	
		Finfish	Shellfish		Boat ramps & Launches	Docks & Wharves	Floating homes	Mooring buoys	Nearshore buildings	Rafts & Floats	Marinas	Shipyards & Terminals
Sockeye/Kokaneee salmon	Adult	12	12	24	12	12	12	31	12	31	11	13
	Juvenile	12	12	23	24	25	24	24	24	24	17	19
	Incubation / Emergence											
	Average	8	6	16	12	12	12	18	12	18	9	10
Steelhead trout	Adult	12	12	24	12	12	12	31	12	31	11	13
	Juvenile	12	12	23	25	25	24	24	24	24	17	19
	Incubation / Emergence											
	Average	8	6	16	12	12	12	18	12	12	9	10
Green sturgeon	Adult	35	32	26	24	24	12	67	24	67	26	21
White sturgeon	Juvenile / Adult	35	32	0	24	24	31	67	26	67	24	24
	Larvae				25	13	24	48	12		24	24
	Eggs / Incubation			16	25	24	76	48	24		24	24
	Average	12	32	5	25	20	44	54	21	67	24	24
Southern resident orca	Resident											