Washington State 2015/16 RSMP
Mussel Monitoring Site Datasheet

DEPLOYMENT INFORMATION

te ID: PSS13175-000002 | Site Name: Arroyo Beach

Bag numbers:	640	855	583	602

Deployer name(s): April Fleming and Alison Evans

Recorder name: April Fleming

Deployment date: 10/26/15 | Time cage anchored: 10:05 pm

Cage GPS location (decimal degrees)	Latitude: N 47° 30'6.29641"	Longitude: W 122° 23'9.5856	Accuracy (± XX feet): ±02ft.

GPS make/model or app name: (must be set to datum NAD83) Map Coordinates

Anchors - type/number used: 2 helical, 1 cinderblock, 3 rebar

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☒ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 10:30 AM | **Height of most recent LOW tide (feet):** 3' (we deployed on outgoing tide)

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☒	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☒	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☒ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:
Very loose sand, anchors & rebar could be installed by hand w/o mallet or anchor bar. Neighbor mentioned much of sand washes away in winter. Site used to be gravel mine w/ train & pier w/ creosote pilings. Remnants of these pilings still exist 50-100' to the north of site.

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☐ Rural residential; ☐ Undeveloped; ☒ Urban residential; ☒ Other Historical gravel mining site

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: concrete & wood

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☐ No; ☒ Yes, type/makeup: old railway tracks & pier pilings w/ creosote (50-100' away)

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☒ Breakwater; ☒ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: See note below (*)

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☒ Other: See note below

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: None Known Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: None Known Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: N/A Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
(*) Historically a gravel mine w/ large creosote (possibly) pier on beach. Remains of pier still visible on ~~beach~~ beach 30 meters away.

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: 2		Site Name: Arroyo Beach		
Bag numbers:	640 ~~855~~	855	583	602
Retriever name(s): April Fleming & Alison Evans				
Recorder name: Alison Evans				
Retrieval date: 2/8/16		Time cage removed: 9:40 pm		
Cage GPS location (decimal degrees)	Latitude: 47° 37' 6.2964"	Longitude: 122° 23' 5856'	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83) iPhone ap				

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
None seen but dark when onsite - Homeowner says none seen.

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):
No significant changes noted. Cage still well anchored and in good condition.

Unfinished copy of datasheet - still waiting for original from volunteer. JAL 3/24/2016

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DEPLOYMENT INFORMATION

Site ID: PSS13175-000003	Site Name: Brackenwood Lane		
Bag numbers:	685	687	698	681
Deployer name(s):	Josh Frederick, Deb Rudnick, Mary Meier		
Recorder name:	Mary Meier		
Deployment date:	10/26/15	Time cage anchored:	9:58 pm
Cage GPS location (decimal degrees)	Latitude: N 47.682339	Longitude: 122.506474W	Accuracy (± XX feet): 12
GPS make/model or app name: (must be set to datum NAD83)	COMMADER COMPASS LITE		
Anchors - type/number used:	Helical anchor, three rebar		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☑ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: **Height of most recent LOW tide (feet)**:

Precipitation: ☑ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☑	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☐	20 - 40% ☐	40 - 60% ☑	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☑ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☑ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☑ Yes

Other habitat comments/observations:

Beautiful, calm night, near full moon, sand flews covering + muddy. Residental home and concrete bulkhead to north.

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☐ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☑ Other Suburban residential

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☑ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☑ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☑ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☑ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☑ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: unknown (i.e. mouth diameter);
Type: Seep from hillside pipe Condition: unknown

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.): none

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
Cage is due east of rect wood cut of log

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name:		
Bag numbers:				
Retriever name(s):				
Recorder name:				
Retrieval date:		Time cage removed:		
Cage GPS location (decimal degrees)	Latitude:	Longitude:	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)				
ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?				
Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):				

CP-1
~~PB~~ #4

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PSSS13175 000004 **DEPLOYMENT INFORMATION** Northern

Site ID: Cherry	Site Name: Cherry Point ~~North~~		
Bag numbers:	914	915	938	924
Deployer name(s): Michael Kyte			
Recorder name: Mackenna Newmarch			
Deployment date: 10/27/2015	Time cage anchored: 11:37 pm		
Cage GPS location (decimal degrees)	Latitude: N 48.85844	Longitude: W 122.74072	Accuracy (± XX feet): ± 03 m ~~NAD~~ 0107
GPS make/model or app name: (must be set to datum NAD83)	Garmin Montana, NAD83		
Anchors - type/number used:	Re-Rod - 3 + 3 Rocks.		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 12:01am ~~-1.09~~ -1.064 **Height of most recent LOW tide (feet)**: ~~-1.09 ft~~ -0.446 MLLW

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☒	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☒ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☐ Yes

Other habitat comments/observations:

cage is on shoreside of large boulder.

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☒ Commercial; ☒ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☒ Rural residential; ☒ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☒ None;

☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

CRN

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: none

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
Adjacent to large boulder on shore side.

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: Cherry		Site Name: Cherry Point N.		
Bag numbers:	914	938	924	915
Retriever name(s): M. Kyte, M. Harris, N. Seyester, H. Young				
Recorder name: M. Harris				
Retrieval date: 7/8/2016		Time cage removed: 9:45 PM		
Cage GPS location (decimal degrees)	Latitude: 48.85844N	Longitude: 122.74072	Accuracy (± XX feet): ±3m	
GPS make/model or app name: (must be set to datum NAD83)				

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
A couple creosote logs on beach on route to cage, but nothing specific/different @ cage

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):
Cage well anchored
2 small spider crabs in cage; no signs of predation or cage damage.

PSS13775-000005

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DEPLOYMENT INFORMATION

Site ID: RSMP #5	Site Name: Salmon Beach		
Bag numbers:	651	667	657	661
Deployer name(s): Kristin Williamson ; Scott Wunstar			
Recorder name: Kristin Williamson			
Deployment date: 10.26.15	Time cage anchored: 9:48pm		
Cage GPS location (decimal degrees)	Latitude: 47.29470	Longitude: -122.53051	Accuracy (± XX feet): ±16 ft
GPS make/model or app name: (must be set to datum NAD83)	GPSMAP 60CS Garmin		
Anchors - type/number used:	1 Helical Anchor ; 2 Rebar		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 10:03pm **Height of most recent LOW tide (feet):** -0.95

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☐	20 - 40% ☒	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☒ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☐ Yes

Other habitat comments/observations:

Cobble - gravel mix w/ underlying sand & clay

Bull kelp & sargassum out past 0 MLLW

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☐ Rural residential; ☐ Undeveloped; ☒ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 90 % shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup: overwater structures - houses on bulkhead & pilings
creosote pilings

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☒ Other: OVERWATER STRUCTURE - HOUSE TO +8FT MLLW

Dock/pier/wharf material: ☒ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☒ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

STORMWATER OUTFALL 200 ft TO THE NORTH FROM RESIDENTIAL PARKING LOT
BNSF RAILWAY 700 ft TO THE SOUTH

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

CAGE IS 30-40 ft FROM THE EDGE OF THE HOUSE

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:	NSMP #5	Site Name:	SALMON BEACH	
Bag numbers:	651	667	657	661
Retriever name(s):	KRISTIN WILLIAMSON SCOTT WUNSCH			
Recorder name:	KRISTIN WILLIAMSON			
Retrieval date:	2.9.2016	Time cage removed:	10:45	
Cage GPS location (decimal degrees)	Latitude: —	Longitude: —	Accuracy (± XX feet): —	

GPS make/model or app name: (must be set to datum NAD83) GPS FAILED.

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

NO

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures and cage): 3 STARFISH AROUND CAGE.
CAGE IN GOOD CONDITION, WELL ANCHORED, NO BREAKING.
SEVERAL MUSSELS LOOKED OPEN OR DEAD.

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DEPLOYMENT INFORMATION

Site ID: PSS13175-000006 006	Site Name: Bainbridge Island - Eagle Harbor Dr.		
Bag numbers: 713	679	695	704
Deployer name(s): Frank Stowell			
Recorder name: Vanessa Cass			
Deployment date: 10.26.2015	Time cage anchored: 10:01 PM		
Cage GPS location (decimal degrees)	Latitude: 47° 31' 8" N	Longitude: 122° 31' 39" W	Accuracy (± XX feet): ~90 FT
GPS make/model or app name: (must be set to datum NAD83)	Iphone 6 ~~GPS~~ compass app		
Anchors - type/number used:	helical anchor (1), rebar stakes (3)		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☑ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☑ Sheltered

Time of most recent LOW tide: 11 PM 1055 pm **Height of most recent LOW tide (feet):** −0.81

Precipitation: ☑ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☑ cobble below

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☐	20 - 40% ☐	40 - 60% ☑	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☑ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☐ No; ☑ Yes; Natural spring/freshwater seep: ☐ No; ☐ Yes

Other habitat comments/observations:

3 sea stars on dock piling, lots of crabs (1 red rock, 1 that looked like gonoplacidae?) lots of smaller crabs

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☑ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☑ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: concrete

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☑ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☑ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☑ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☑ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☑ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
713 had ~~one~~ two mussel open & empty
695 had one mussel open & empty
679 had one mussel open & empty
cage deployed to E. of dock, betn pilings 2 & 3 south/inland of floating dock

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: 006	Site Name: Bainbridge Island - Eagle Harbor			
Bag numbers:	713 ✓	679 ✓	695 ✓	704 ✓
Retriever name(s): Frank Stowell				
Recorder name: Lara Hansen				
Retrieval date: 2-7-16	Time cage removed: 906			
Cage GPS location (decimal degrees)	Latitude:	Longitude:	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)	47° 37' 9" N 122° 31' 39" W / Apple Compass			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):

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DEPLOYMENT INFORMATION

te ID: PSS13175-000008	Site Name: CHIMACUM Creek Delta		
Bag numbers:	883 ✓	876 (1=DOA) 882 (2=DOA) ↳ STINK	886 (1=DOA)
Deployer name(s): Darryl Hrenko, David , Debecca			
Recorder name: DHrenko			
Deployment date: 27 OCT '15	Time cage anchored: 9 12 PM		
Cage GPS location (decimal degrees)	Latitude: 48.04902	Longitude: 122.77225 (chim 3)	Accuracy (± XX feet): ± 11ft
GPS make/model or app name: Garmin VISTA eTrex (must be set to datum NAD83)	NAD83		
Anchors - type/number used: 1 helical , 3 rebar			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☑ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☑ Sheltered

Time of most recent LOW tide: | **Height of most recent LOW tide (feet):**

Precipitation: ☑ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☑	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☑	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☑ Ulva; ☐ Other

Natural streams/rivers present: ☐ No; ☑ Yes; Natural spring/freshwater seep: ☑ No; ☐ Yes

Other habitat comments/observations: Mouth of creek: 400

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☐ Rural residential; ☑ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☑ Soft (plantings, large woody debris, etc.) - 100 % shoreline armored (↑ creosote in armoring?) No

.bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☑ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☑ Other: DFW + COUNTY PARK

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☑ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: NA Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
Down from Doug Fir ~ 100'

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name: Tumacum Creek		
Bag numbers:	876	883	882	886
Retriever name(s):	Darryl Trenko, Dave Sallig, Rebecca Morrow, Zofia Knorek			
Recorder name:	Zofia Knorek			
Retrieval date:	02/05/16		Time cage removed:	1845
Cage GPS location (decimal degrees)	Latitude: 480402	Longitude: 122.77225	Accuracy (± XX feet): ±11ft	
GPS make/model or app name: (must be set to datum NAD83)	Garmin Vista e-trex			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):
In great (surprising!) shape!

Unfinished copy of datasheet - still waiting for original copy from volunteers. JAC 3/24/2016

Deployment Datasheet

Fill out both sides of the DEPLOYMENT INFORMATION completely.

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DEPLOYMENT INFORMATION

Site ID: PSS13175-000010 | Site Name: Bainbridge Island Fox Cove Fletcher Bay

Bag numbers:

Deployer name(s): [illegible]

Recorder name: [illegible]

Deployment date: [illegible] | Time cage anchored: 10pm

Cage GPS location (decimal degrees): Latitude: [illegible] | Longitude: [illegible] | Accuracy (± XX feet): 20

GPS make/model or app name (must be set to datum NAD83): [illegible]

Anchors - type/number used: helical + 3 rebars

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☒ Sheltered

Time of most recent LOW tide: 10:55pm | Height of most recent LOW tide (feet):

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐ | Cobble-gravel mix ☒ | Sand-gravel mix ☐ | Sand ☐ | Sand-mud mix ☐ | Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒ | 1 - 20% ☐ | 20 - 40% ☐ | 40 - 60% ☐ | 60 - 80% ☐ | 80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes. Natural spring/freshwater seep: ☐ No; ☐ Yes

Other habitat comments/observations: Slight sea

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):
☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☒ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other

Erosion control structures (i.e. armoring of shoreline): ☐ None;
☐ Hard (bulkhead, riprap, etc.) - 50 % shoreline armored; Materials used: wood
☐ Soft (plantings, large woody debris, etc.) - ____ % shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)
☐ No; ☐ Yes, type/makeup: 2 pilings still probably creosote

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☒ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☒ Mooring buoy; ☒ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: [illegible]

Dock/pier/wharf material: ☐ Creosote; ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☒ Other: [illegible]

Piling/dolphin material: ☐ Creosote; ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☐ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach) Size: 4 (i.e. mouth diameter).
Type: [illegible] Condition: [illegible]

Outfall (pipe, culvert, point of flow onto beach) Size: [illegible] (i.e. mouth diameter).
Type: [illegible] Condition: [illegible]

Outfall (pipe, culvert, point of flow onto beach) Size: (i.e. mouth diameter).
Type: Condition:

Other obvious sources of pollution (oil sticks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later): [illegible]

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: | Site Name:

Bag numbers:

Retriever name(s):

Recorder name:

Retrieval date: | Time cage removed:

Cage GPS location (decimal degrees): Latitude: | Longitude: | Accuracy (± XX feet):

GPS make/model or app name: (must be set to datum NAD83)

ANY NEW obvious sources of pollution (oil sticks, seeps, etc.)?

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):

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DEPLOYMENT INFORMATION

Site ID:	~~#~~ PSS13175-000011	Site Name:	South Bay Trail / Bellingham Bay Trail
Bag numbers:	912	902	867	901
Deployer name(s):	Ruth Sofield plus Huxley toxicology Students		
Recorder name:	Ruth Sofield		
Deployment date:	8/27/15	Time cage anchored:	10:20pm
Cage GPS location (decimal degrees)	Latitude: W 122.50501	Longitude: N48.72527	Accuracy (± XX feet): ± 30 ft
GPS make/model or app name: (must be set to datum NAD83)	Garmin 62ST		
Anchors - type/number used:	Rebar Stakes and Screwbolt		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: **Height of most recent LOW tide (feet):**

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☒	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☒ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:

Barnacles and mussels common

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply): → Spa

☐ Agricultural; ☒ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☒ Public access;
☐ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 50 % shoreline armored; Materials used: ~~20 Concrete Blocks~~ Big Rocks / Granite

☒ Soft (plantings, large woody debris, etc.) - 40 % shoreline armored (↑ creosote in armoring?) no

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☐ No; ☒ Yes, type/makeup: Old concrete pilings.

Railroad tracks above armoring.

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☒ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☒ Other: Railroad tracks

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☒ Concrete; ☐ Steel; ☒ Other: Wood, but not sure of treatment

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: ~48" (i.e. mouth diameter); ~~None identified~~
Type: Stormwater, source unknown Condition: no flow

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.): None visible.

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: 11		Site Name: South Bay Trail / Bellingham Bay Trail		
Bag numbers:	867	902	901	912
Retriever name(s): Ruth Sofield, Max Miner, Christina Darnell, Henry Cade				
Recorder name: Henry Cade				
Retrieval date: 2/8/2016		Time cage removed: 4:20 pm		
Cage GPS location (decimal degrees)	Latitude: 48.72561	Longitude: -122.50625	Accuracy (± XX feet): 10±12	
GPS make/model or app name: (must be set to datum NAD83) Garmin GPSmap. 60CSx				

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)? General garbage (office chair packaging, plastic water bottles, vacuum tubing) ~~Garmin GPSmap 60CSx~~

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): Cage and immediately surrounding area looked the same when the cage was deployed.

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DEPLOYMENT INFORMATION

te ID: PSS13175-000013	Site Name: Ruston Way		
Bag numbers:	671	652	662	643
Deployer name(s):	Joel Elliott, Jacqueline Elliott		
Recorder name:	Joel Elliott		
Deployment date:	10/26/15	Time cage anchored:	10:25
Cage GPS location (decimal degrees)	Latitude: 47.29267001	Longitude: -122.4949658	Accuracy (± XX feet): ± 3 ft
GPS make/model or app name: (must be set to datum NAD83)	Trimble Geo XT		
Anchors - type/number used:	1 helical + 2 rebar		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 10:59 pm **Height of most recent LOW tide (feet):** 4:20 pm

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☒ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☐ Yes

Other habitat comments/observations:

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☒ Major road/highway; ☐ Park; ☐ Public access;
☐ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: riprap

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

oandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☐ No; ☒ Yes, type/makeup: old lumber mill nearby

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☒ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
site of old lumber mill and brick factory nearby

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PSS 13175-000013	Site Name: Ruston Way			
Bag numbers:	662	671	643	652
Retriever name(s): Joel Elliott, Sophie Soares.				
Recorder name: Joel Elliott				
Retrieval date: 2/9/2016		Time cage removed:		
Cage GPS location (decimal degrees)	Latitude: 122°29'41.944 W	Longitude: 47°17'33.656 N	Accuracy (± XX feet): pdop 1.5	
GPS make/model or app name: (must be set to datum NAD83)	Trimble Geo XT			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
N/A

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):
N/A

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DEPLOYMENT INFORMATION

Site ID: PSS13175-000014	Site Name: Point Heron East		
Bag numbers:	625	630	613	620
Deployer name(s): Luke Kelly (Not "621" as stated in chain of custody form)			
Recorder name: Luke Kelly			
Deployment date: 10/26/2015	Time cage anchored: 11:30 PM		
Cage GPS location (decimal degrees)	Latitude: 47.57010	Longitude: 122.60691	Accuracy (± XX feet): +/- 9'
GPS make/model or app name: (must be set to datum NAD83)	Garmin GPS Map 76Cx		
Anchors - type/number used:	1 x helix 2 x rebar		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 11:13 PM **Height of most recent LOW tide (feet)**: -0.8

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☒ Park; ☒ Public access;
☐ Rural residential; ☐ Undeveloped; ☒ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 90 % shoreline armored; Materials used: boulder & concrete bulkheads

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☒ Other: residential

~~Dock~~/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

~~Piling~~/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: ~36" (i.e. mouth diameter); (~500 south of cage site at Bachmann Park)
Type: Steel culvert/Pipe Condition: old but appears intact

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
1 dead mussel in each sample: 613 and 620 (2 dead mussels total)
* chain of custody form states sample "621". Should be "620" since that is what was supplied

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: 14	Site Name: Point Heron East			
Bag numbers:	613	625	620	630
Retriever name(s): Elizabeth Unsell				
Recorder name: "				
Retrieval date: 2-5-16	Time cage removed: 10:45			
Cage GPS location (decimal degrees)	Latitude: 47.57011	Longitude: 122.60699	Accuracy (± XX feet): 13.2	
GPS make/model or app name: (must be set to datum NAD83) Garmin 72H				

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):
good condition

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DEPLOYMENT INFORMATION

te ID: PSS13175-000015	Site Name: Tugboat Park (Anacortes)		
Bag numbers:	980 - (1 empty shell)	942	941	979
Deployer name(s): Timothy Manns + Brenda Cunningham			
Recorder name: Timothy Manns			
Deployment date: October 28, 2015	Time cage anchored: 21:50		
Cage GPS location (decimal degrees)	Latitude: N 48.48932	Longitude: W-122.67606	Accuracy (± XX feet): ±4'
GPS make/model or app name: (must be set to datum NAD83)✓	Garmin Etrex 30X		
Anchors - type/number used: 1 helical anchor and 3 rebar anchors			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

(Burrows Bay/Allen Is. gauge)

Time of most recent LOW tide: 10:57 A.M. **Height of most recent LOW tide (feet):** 3.8'

Precipitation: ☐ None; ☒ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☒	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:
The cage is at the base of a breakwater among sand and angular rocks associated with the breakwater. The breakwater is perpendicular to a sandy beach.

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☒ Park; ☐ Public access;
☒ Rural residential; ☐ Undeveloped; ☒ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None; The cage is positioned where a breakwater and sandy beach meet. The breakwater protects the entrance to a marina.

☒ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: rock

☒ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring? No.)

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☒ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: Park

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition: N/A

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PSS13175-000015	Site Name: Tugboat Park			tag detached
Bag numbers:	980	941	979	942

Retriever name(s): Timothy Manns + Brenda Cunningham

Recorder name: " " (GPS reading by Brenda Cunningham)

Retrieval date: Feb. 5, 2016 Time cage removed: 19:03

Cage GPS location (decimal degrees)	Latitude: N 48.48929	Longitude: W -122.67609	Accuracy (± XX feet): ± 9 feet

GPS make/model or app name: Garmin etrex 30x
(must be set to datum NAD83)

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
None

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): The cage was intact and in good condition. Almost no accumulated algae. The cage was buried in sand to within an inch or two of the suspended bags of mussels.
* The "942" mussel bag tag was detached and lying at the bottom of the cage.

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DEPLOYMENT INFORMATION

Site ID: PSS13175 - 000016	Site Name: Meadowdale Beach		
Bag numbers:	576	571	566	506
Deployer name(s): Cathy Stanley, Sarah Brown, Rachel Pryor, Doug Dailer			
Recorder name: Cathy Stanley			
Deployment date: 10/20/2015	Time cage anchored: 10 pm		
Cage GPS location (decimal degrees)	Latitude: 47.85449	Longitude: -122.33518	Accuracy (± XX feet): ± 10 feet
GPS make/model or app name: (must be set to datum NAD83)	Garmin GPS Map 76Cx (WGS 84)		
Anchors - type/number used:	Helical & 3 rebar		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 9:55 pm **Height of most recent LOW tide (feet):** 0

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☒	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☒ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:

Stormwater drain

Substrate was mostly sand with some cobble & small boulders just down from an area of mostly mixed cobble & small boulders. Sand was about 6-8" deep on top of cobble/small boulders & it took several trys to find a spot to get helical anchor in.

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☐ Rural residential; ☐ Undeveloped; ☒ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: RipRap Rock - Railroad

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☐ No; ☒ Yes, type/makeup: old docks about ~300 yards south

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☒ Other: railroad tracks

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: ~2FT D (i.e. mouth diameter);
Type: stormwater Condition: FAIR – culvert through Railroad Rip Rap

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PSS13175-000016	Site Name: MEADOWDALE			
Bag numbers:	576	571	566	586

Retriever name(s): CATHY, SARAH, RACHEL, DOUG DALLER, LINCOLN LEHR

Recorder name: RACHEL PRYOR

Retrieval date: 2/5/16 Time cage removed: ~~0800~~ 2000

Cage GPS location (decimal degrees)	Latitude: 47.85449	Longitude: -122.33518	Accuracy (± XX feet):

GPS make/model or app name:
(must be set to datum NAD83) GARMIN GPS MAP 76C

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

NO

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): NO

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DEPLOYMENT INFORMATION

Site ID: ~~#17~~ PSS13175-000017	Site Name: lower Budd Inlet ~~West Bay~~		
Bag numbers:	660	672	663	670
Deployer name(s): Steve Booth + Aimee Christy			
Recorder name: Aimee Christy			
Deployment date: 10/26/15	Time cage anchored: 10:45 pm		
Cage GPS location (decimal degrees)	Latitude: 47.06892	Longitude: 122.91949	Accuracy (± XX feet): ±3 m
GPS make/model or app name: (must be set to datum NAD83)	Garmin e-trex Summit		
Anchors - type/number used:	3 rebar + 1 helical stake		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☒ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 11:49 pm **Height of most recent LOW tide (feet):** -10"

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:

672 - 3 dead + 1 shrimp 663 - 2 dead
660 - 1 dead 670 - 1 dead

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☒ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☒ Soft (plantings, large woody debris, etc.) - 80 % shoreline armored (↑ creosote in armoring?) boulders, ivy

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☐ No; ☒ Yes, type/makeup: old shed on stilts. Stilts have ~30 tires around them. Also an abandoned floating wood/foam dock roped to shore.

logging terminal ~1/8 mile South ~1/4 mile South

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crumbled to ground

Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☒ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☒ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☒ Raft/float; ☐ Road; ☒ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other: very old

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other: very old

Tires present: ☐ No; ☒ Yes - Estimated Number: 35 Used for: Surrounding pilings/stakes on abandoned shed.

Outfall (pipe, culvert, point of flow onto beach): Size: 8-10" (i.e. mouth diameter);
Type: pipe Condition: good

Outfall (pipe, culvert, point of flow onto beach): Size: 8-10" (i.e. mouth diameter);
Type: pipe Condition: good
for drainage from hillside

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
500 ft to the South is a timber loading facility
150 ft to South is marina

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
directly in front of house.

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: #17 Site Name: Lower Budd Inlet

Bag numbers: 6660 6672 6663 6670

Retriever name(s): Steven Booth

Recorder name: Aimee Christy

Retrieval date: 2/8/16 Time cage removed: 10:00 PM

Cage GPS location (decimal degrees) Latitude: same as before Longitude: Accuracy (± XX feet):

GPS make/model or app name: (must be set to datum NAD83) same

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)? no

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): all clean - no fouling - looked great!

* I accidentally snipped the zip tie on one end of a mussel clump (it's in the bag w/ only 1 clump)

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DEPLOYMENT INFORMATION

te ID: 18 (PSS13175-000018)	Site Name: Burien site 18 Seahurst		
Bag numbers: 604	605 - 1 dead mussel	608	618 - 1 dead mussel
Deployer name(s): Dani Kendall Norman Lau Janice Mathisen			
Recorder name: Janice			
Deployment date: 10/26/15	Time cage anchored: 10:05 pm		
Cage GPS location (decimal degrees)	Latitude: 47° 27.793 N	Longitude: 122° 22.144 W	Accuracy (± XX feet):
GPS make/model or app name: Magellan 315 (must be set to datum NAD83)			
Anchors - type/number used: 1 helical + 3 rebar			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☒ Sheltered

Time of most recent LOW tide: 11:02 pm **Height of most recent LOW tide (feet):** −0.9

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☒	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☐	20 - 40% ☐	40 - 60% ☒	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☒ Eelgrass; ☐ Kelps; ☐ Fucus; ☒ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☒ Yes 3 seeps nearby

Other habitat comments/observations:
LIVE • red rock crab • graceful Cancer crab Shell debris on upper section of beach - clams
• kelp crab • helmet crab
• moon glow anemones
cobble @ top of beach transitioning to sand + silt, some muddy sections

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☐ Rural residential; ☐ Undeveloped; ☒ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: large rocks (see pictures)

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

oandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☐ No; ☒ Yes, type/makeup: 8 small creosoted wood pilings ~ 30 yards from cage, 100' N of fr. boat ramp

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Current shoreline use (check all that apply): ☒ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☒ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: small wood raft/platform moored offshore

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☐ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: 8" (i.e. mouth diameter);
Type: plastic corregated pipe Condition: pl - intact - see picture

Outfall (pipe, culvert, point of flow onto beach): Size: 6" (i.e. mouth diameter);
Type: plastic corregated pipe Condition: intact

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
1 tire 1/2 buried in sand
3-4 seeps

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
wood platform ~ 50y. fr. shore / bulkhead
2nd Seep 50' N. of boat ramp
8 pilings - creosoted 100' N. of boat ramp - high intertidal

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PSS13175-000018	Site Name: Burien			
Bag numbers:	604 ~~608~~	608	605	618
Retriever name(s): Dani Kendall Norm Lau Janice Mathisen				
Recorder name: Janice				
Retrieval date: 2/9/16		Time cage removed: 10:02 pm		
Cage GPS location (decimal degrees)	Latitude: 47.27.994 N	Longitude: 122 22.142W	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83) Magellan 315				
ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?				
Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): Cage in good condition, mussels in bags attached to the cage in their original position				

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DEPLOYMENT INFORMATION

te ID: PSS 13175-000019	Site Name: Skiff Point - Bainbridge Island		
Bag numbers:	588	600	586	584
Deployer name(s): Keith Bradley-Hewitt, Jim Brennan, Angela Kaurin			
Recorder name: Jane Hannuksela			
Deployment date: 10/26/15	Time cage anchored:		
Cage GPS location (decimal degrees)	Latitude: N47.66122	Longitude: W122.49911	Accuracy (± XX feet): ±1 meter
GPS make/model or app name: (must be set to datum NAD83)	Garmin Map 76 CSX - note - last 2 digits are jumping around		
Anchors - type/number used: 1 cinder block, 2 helical anchors			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 10:55 PM **Height of most recent LOW tide (feet):** -0.8

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☒	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☒ Fucus; ☒ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:
exposed point (Skiff Point) in front of bluff

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☒ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup: stair tower kind of near

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☒ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: residential drainage pipes over bluff (3)

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: 6" (i.e. mouth diameter);
Type: PVC or ABS pipe Condition: good (2) Poor (1) - corrugated stormwater outfall over face of bluff

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
none

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
on adjacent land - tall tree between white & black pipes - cage is waterward midway between pipes near medium boulder. 2 man rock

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PSS13175-000019	Site Name: SKiff Point			
Bag numbers:	588	600	586	584
Retriever name(s): Jane Hannukseia, Keith Bradley-Hewitt, Jim Brennan.				
Recorder name: Keith Bradley-Hewitt				
Retrieval date: 2/7/2016		Time cage removed: 9:00 PM		
Cage GPS location (decimal degrees)	Latitude: N47.66122	Longitude: W122.49911	Accuracy (± XX feet): ± 1 meter	
GPS make/model or app name: (must be set to datum NAD83) Garmin map 76 CSX				

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
N/A - nothing visibly polluted

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): Cage has not moved

LOST CAGE

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DEPLOYMENT INFORMATION

te ID: PSS13175-000020	Site Name: PORT ANGELES WATERFRONT TRAIL		
Bag numbers:	885	889	891	886
Deployer name(s):	HOLLE ANDERSON, GOLY GUDGEL, BETSY WHARTON		
Recorder name:	HOLLE ANDERSON		
Deployment date: 10/27/15	Time cage anchored: 7:50 PM		
Cage GPS location (decimal degrees)	Latitude: 48.118611	Longitude: 123.426944	Accuracy (± XX feet):
GPS make/model or app name: (must be set to datum NAD83)	GARMIN eTREX 10		
Anchors - type/number used:	2 REBAR + ROCKS / BOULDERS		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☒ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 09:41 PM **Height of most recent LOW tide (feet):** −0.99

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☒	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☒ Fucus; ☒ Ulva; ☐ Other

Natural streams/rivers present: ☐ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☐ Yes

Other habitat comments/observations:

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☒ Park; ☒ Public access;
☐ Rural residential; ☐ Undeveloped; ☒ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: BOULDERS

☐ Soft (plantings, large woody debris, etc.) - 0 % shoreline armored (↑ creosote in armoring?)

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☐ No; ☒ Yes, type/makeup: PILINGS

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☒ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☒ Other: WATER FRONT TRAIL

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
THE CAGE IS DUE NORTH OF THOMAS MARTIN SR MEMORIAL PLATE CLOSE TO RIPRAP NESTED AMONG ROCKS AND BOULDERS

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name: PORT ANGELES WATER FRONT TRAIL		
Bag numbers:				
Retriever name(s):				
Recorder name:				
Retrieval date:		Time cage removed:		
Cage GPS location (decimal degrees)	Latitude: HBR ~~(48° 07.065) 48.11611~~	Longitude: ~~123.426944~~ ~~(123° 25.369) 48.12~~	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83) ~~GARMIN ETREX 10~~				

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): WE WENT BACK FEB 6, 2016 TO RETRIEVE THE CAGE BUT IT WAS GONE. WE CHECKED THE BEACH ABOUT 200-300 FT ON BOTH SIDES OF THE DEPLOYMENT LOCATION AND ONLY FOUND ONE REBAR

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DEPLOYMENT INFORMATION

te ID: PSS13175-000021	Site Name: Pt. Defiance Ferry Terminal		
Bag numbers:	648	646	669	650
Deployer name(s): Joel Elliott, Jacqueline Elliott			
Recorder name: Joel Elliott			
Deployment date: 10/26/15	Time cage anchored: 10:05		
Cage GPS location (decimal degrees)	Latitude: 47.30613665	Longitude: -122.5145747	Accuracy (± XX feet): ± 3 ft.
GPS make/model or app name: (must be set to datum NAD83) Trimble GeoXT			
Anchors - type/number used: 1 helical anchor + 2 rebar.			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☒ Sheltered

Time of most recent LOW tide: 10:59 pm **Height of most recent LOW tide (feet):** 4:20 pm

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☒	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☒ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☐ Yes

Other habitat comments/observations:

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☒ Commercial; ☐ Industrial; ☒ Major road/highway; ☒ Park; ☐ Public access;
☐ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: rock

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☒ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☒ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☒ Road; ☒ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☒ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☒ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
– part of ferry pier are creosote pilings nearby.

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PSS13175-000021	Site Name: Pt. Defiance Ferry Terminal			
Bag numbers:	648	646	669	650
Retriever name(s): Joel Elliott, Sophie Sorrel				
Recorder name: Joel Elliott				
Retrieval date: 2/9/2016	Time cage removed:			
Cage GPS location (decimal degrees)	Latitude: 47°18'22.074"N	Longitude: 122°30'52.479"W	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83) Trimble Geo XT				

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
no

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):

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DEPLOYMENT INFORMATION

te ID: PSS13175-000022	Site Name: BEACH DRIVE E1		
Bag numbers:	921	931	920	923
Deployer name(s): MIKE BEHRENS			
Recorder name: CYNDY DILLON			
Deployment date: 10/27/15	Time cage anchored: 2305		
Cage GPS location (decimal degrees)	Latitude: 47.55933	Longitude: 122.59695	Accuracy (± XX feet): 17
GPS make/model or app name: (must be set to datum NAD83) GARMIN ETREX VENTURE			
Anchors - type/number used: CINDERBLOCK, EARTH ANCHOR, REBAR			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☑ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☑ Moderately exposed; ☐ Sheltered -1.71

Time of most recent LOW tide: 2355 **Height of most recent LOW tide (feet):**

Precipitation: ☑ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☑	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☑	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☑ Ulva; ☐ Other

Natural streams/rivers present: ☑ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☐ Yes

Other habitat comments/observations:

OYSTER/MUSSEL HOME CULTURE

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☑ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☑ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

oandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☑ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☑ Other: PRIVATE BEACH ACCESS

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other: NONE

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other: NONE

Tires present: ☑ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter); NONE
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
JUST INSIDE 2 LARGE ROCKS
DEAD CRAB

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PSS 13175-22	Site Name: Beach Drive		
Bag numbers:	920	923	921	931
Retriever name(s): Michael Behrens, Stena Troyer			
Recorder name: Michael Behrens			
Retrieval date: 2/10/16	Time cage removed: 11:30 PM		
Cage GPS location (decimal degrees)	Latitude: 47.55934	Longitude: 122.59696	Accuracy (± XX feet): ±11
GPS make/model or app name: (must be set to datum NAD83) Etrex legend			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
None

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): No movement or damage to cage. No fouling of the cage but many Ducella lamellosa on/under cage.

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DEPLOYMENT INFORMATION

te ID: PSS13175-000023	Site Name: WING Point, Bainbridge Is		
Bag numbers:	596 597 591 598		
Deployer name(s): Cami Apfelbeck, Sarah Farley, Gerlind Jenkner			
Recorder name: Gerlind Jenkner			
Deployment date: 10-26-15	Time cage anchored: 10:20pm		
Cage GPS location (decimal degrees)	Latitude: 47.622225	Longitude: -122.496555	Accuracy (± XX feet): ?
GPS make/model or app name: (must be set to datum NAD83)	Appname: "what my lat and longitude"		
Anchors - type/number used: Helical Anchor, 3 rebar			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered increasing energy w/ ferry

Time of most recent LOW tide: 10:55pm **Height of most recent LOW tide (feet):** -0.8ft

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☒	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:
Bag 596: 1 mussel is empty.
597: 1 - " - - " -
591 1 - " - - " -

~10 feet shore side of float attached to round concrete anchor.
(cage anchor location)

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☒ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☒ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☒ Other: residential

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other: N/A

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other: N/A

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter); N/A
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter); N/A
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter); N/A
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
Close to ferry lane & terminal; large wake; from ferry
Channel marker ~200 ft from cage
off shore

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
Concrete anchor with red & white float attached ~10 ft from cage

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PSS13175 - 000023	Site Name: Wing Point - Bainbridge Island		
Bag numbers:	591	598	596	597
Retriever name(s): Cami Apfelbeck, ~~Sarah Farley~~, Gerlind Jenkner Katie Kennedy			
Recorder name: Gerlind Jenkner			
Retrieval date: 2/7/16	Time cage removed: 9:23 p.m.		
Cage GPS location (decimal degrees)	Latitude: 47.622190	Longitude: -122.496488	Accuracy (± XX feet): 2 what's my latitude app.
GPS make/model or app name: (must be set to datum NAD83)	What's my latitude / longitude app		

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
no change

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): The bottom of the cage was covered with about 2" of sediment. change

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DEPLOYMENT INFORMATION

Site ID: PSS13175-000024	Site Name: South of Skunk Island		
Bag numbers:	890	894	875	892-3dead
Deployer name(s): Zofia Knorek, Carolyn Woods, Katie Conroy			
Recorder name: Katie Conroy			
Deployment date: 10/27/2015	Time cage anchored: 9:10PM		
Cage GPS location (decimal degrees)	Latitude: 48.13557	Longitude: -122.76060	Accuracy (± XX feet): ±2ft
GPS make/model or app name: (must be set to datum NAD83) Garmin etrex 10			
Anchors - type/number used: Rebar-3 | 1 bullet			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☑ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☑ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: | **Height of most recent LOW tide (feet)**:

Precipitation: ☑ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☑

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☐	20 - 40% ☐	40 - 60% ☑	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☑ Ulva; ☐ Other

Natural streams/rivers present: ☑ No; ☐ Yes; Natural spring/freshwater seep: ☑ No; ☐ Yes

Other habitat comments/observations:
outflow of ~~[illegible]~~ storm drain

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☑ Major road/highway (HWY 116); ☐ Park; ☐ Public access;
☐ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☑ None;

☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☑ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☐ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: 12" (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name: S of Skunk Island		
Bag numbers:	890	894	875	892
Retriever name(s): Darryl Hrenko, Zofia Knorek, Rebecca Moston.				
Recorder name: ZOFIA KNOREK				
Retrieval date: 05 Feb. 2016		Time cage removed: 1928		
Cage GPS location (decimal degrees)	Latitude: 48.020660	Longitude: -122.75018	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)				

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

NO

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):

Also in good shape, much muddier than Chimakum creek site!

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DEPLOYMENT INFORMATION

te ID: PSS13175-000025	Site Name: Blair waterway		
Bag numbers:	953	944	978	956
Deployer name(s): Dr. Jim Gawel, Carrie Shannon & Kimberly Rocha			
Recorder name: Kimberly Rocha			
Deployment date: 28 Oct 2015		Time cage anchored: 2258	
Cage GPS location (decimal degrees)	Latitude: N 47.27578	Longitude: W 122.41737	Accuracy (± XX feet): ?
GPS make/model or app name: (must be set to datum NAD83)	Garmin etrex. VISTA HCx		
Anchors - type/number used:	rebar stakes x2 helical anchors x1		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☒ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: closest? 12:25 a.m (10/29/15) **Height of most recent LOW tide (feet):** −2'3"

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:
Located down from a Strip marina, small tidal bay sandwiched btw. container ship ports

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☒ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☐ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: Riprap (rock)

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☒ Shipyard or terminal; ☐ Utilities; ☐ Other: NO USE

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
Oil Slicks
Heavy sulfur smell in the area.

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
Down a hill of large rocks from ship yard

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PSS13175-000025	Site Name: Blair Waterway			
Bag numbers:	978	956	953	944
Retriever name(s): Jim Gawel				
Recorder name: Jim Gawel				
Retrieval date: 2/9/16		Time cage removed: 10:21 PM		
Cage GPS location (decimal degrees)	Latitude:	Longitude:	Accuracy (± XX feet):	

GPS make/model or app name:
(must be set to datum NAD83)

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):
cage in perfect shape, no predators

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DEPLOYMENT INFORMATION

Site ID: PSS13175-000026	Site Name: Illahee . N of Illahee State Park		
Bag numbers:	665	658	664	654
Deployer name(s): Brittany + Frank Gordon			
Recorder name: Brittany Gordon			
Deployment date: 10/26/15	Time cage anchored: 10:00 PM		
Cage GPS location (decimal degrees)	Latitude: 47.603156	Longitude: -122.597856	Accuracy (± XX feet): ±26 ft
GPS make/model or app name: Handy GPS App (must be set to datum NAD83)	datum WGS 84 zone 10T		
Anchors - type/number used: 1 helical, 3 rebar			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 10:00PM **Height of most recent LOW tide (feet):** 0 FT

Precipitation: ☒ None; ☐ Steady rain; ☒ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:
Potential stream to south; visible scour on aerial

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☒ Rural residential; ☐ Undeveloped; ☒ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 90 % shoreline armored; Materials used: Concrete

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☒ Other: Yards, beach access, homes

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
Per aerial, there may be an outfall + stream to south (visible scour in aerial.)

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PSS19175-000026	Site Name: N of Illahee State Park			
Bag numbers:	665	658	664	654
Retriever name(s): B Gordon, Karen (USGS)				
Recorder name: B Gordon				
Retrieval date: 2/7/16		Time cage removed: 9:40 PM		
Cage GPS location (decimal degrees)	Latitude: 47.603156	Longitude: -122.597856	Accuracy (± XX feet): ±26'	
GPS make/model or app name: (must be set to datum NAD83)	Handy GPS App	WGS 84		

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
definitely an outfall @ S. property line

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):

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PSS13175-000027 **DEPLOYMENT INFORMATION**			
ID: 27	Site Name: Clarks Point Chuckanut Bay		
Bag numbers:	911	909	913	910
Deployer name(s): Scarlett Graham, Matt Luxon, Ken Carrasco			
Recorder name: Scarlett Graham			
Deployment date: 10/27/2015	Time cage anchored: 10:00 PM		
Cage GPS location (decimal degrees)	Latitude: 41.4441 48°.~~4441~~ N	Longitude: 122°.30.2549 W	Accuracy (± XX feet): ±16ft
GPS make/model or app name: (must be set to datum ~~NAD83~~) WGS 84 / MotionX app			
Anchors - type/number used: 3 rebar ~~st~~ rods, 1 screw anchor			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 11:15AM 10/27 **Height of most recent LOW tide (feet):** 3.5 ft

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☒ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☐ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☐ Yes

Other habitat comments/observations:
- eelgrass washed up on beach; none attached
- lots of young crab

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☐ Rural residential; ☒ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 50 % shoreline armored; Materials used: natural / bulkhead

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☐ No; ☒ Yes, type/makeup: dock, old pilling

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Current shoreline use (check all that apply): ☒ Boat ramp/launch; ☒ Boathouse/shed; ☐ Bridge; ☒ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☒ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☒ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☐ No; ☒ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
piece of rusty steel cable near cage

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: 27		Site Name: Clark's Point Chuckanut Bay		
Bag numbers:	909	911	910	913
Retriever name(s): Scarlett Graham, Matt Luxon, Chris				
Recorder name: Scarlett Graham				
Retrieval date: 2-8-2016		Time cage removed: 9:00 PM		
Cage GPS location (decimal degrees)	Latitude: 48° 41.4441 N	Longitude: 122° 30.2549 W	Accuracy (± XX feet): ± 16 ft	
GPS make/model or app name: (must be set to datum NAD83)	WGS 84 / Motion X App			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
No

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):
Cage in good condition, no fouling.
No signs of disturbance, cage well secured

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DEPLOYMENT INFORMATION

Site ID: PSS 13175-000028	Site Name: Crescent Harbor Oak Harbor		
Bag numbers:	838	835	846	854
Deployer name(s):	Jamie Hartley, Mark Kennedy		
Recorder name:	Mark Kennedy		
Deployment date:	10/26/2015	Time cage anchored:	9:50 PM
Cage GPS location (decimal degrees)	Latitude: 48.2639956	Longitude: 122.6539767	Accuracy (± XX feet):
GPS make/model or app name: (must be set to datum NAD83)	App name: Simple GPS coordinate display (Generic Co) 8 satellite 3	note: could not determine datum	
Anchors - type/number used:	4 - 1 screw & 3 rebar		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☑ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☑ Sheltered

Time of most recent LOW tide: 10/26/15 10:18 AM **Height of most recent LOW tide (feet):** 3.0

Precipitation: ☑ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☑	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☑	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☑ Other

Natural streams/rivers present: ☑ No; ☐ Yes; Natural spring/freshwater seep: ☑ No; ☐ Yes

Other habitat comments/observations:
Some cobbles lying on top of sand. Cobbles covered with naturally occurring mussels.

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☐ Rural residential; ☐ Undeveloped; ☑ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☑ None;

☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☑ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: no man-made constructs

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☑ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: none Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: none Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: none Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
none

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
substrate is sand with shells (cockles, mussels, etc)

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.) Oak Harbor

Site ID: PSS-13175-000028	Site Name: Crescent Harbor, Whidbey Is		
Bag numbers:	838	835	846	854
Retriever name(s): Mark Kennedy, Jan Morton			
Recorder name:			
Retrieval date: 2/5/2016	Time cage removed: 8:40 PM PST		
Cage GPS location (decimal degrees)	Latitude: N/A	Longitude:	Accuracy (± XX feet):
GPS make/model or app name: (must be set to datum NAD83) N/A			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
No

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): No changes, cage was in good condition. Two of the ID tags had fallen off the mussels, but stayed in the cage.

Mussels in two plastic bags. Wrote the GPS coords on a piece of paper that got so wet the ink ran and was illegible

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DEPLOYMENT INFORMATION

Site ID: PSS13175-000029	Site Name: Liberty Bay		
Bag numbers:	843	841	847	844
Deployer name(s): Elizabeth Unsell			
Recorder name: Elizabeth Unsell			
Deployment date: 10-26-15	Time cage anchored: 10:07		
Cage GPS location (decimal degrees)	Latitude: 47.73747	Longitude: 122.65070	Accuracy (± XX feet): 18
GPS make/model or app name: (must be set to datum NAD83)	GPS 72H Garmin		
Anchors - type/number used:	1 helical anchor, 3 pieces rebar		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☒ Sheltered

Time of most recent LOW tide: | **Height of most recent LOW tide (feet):**

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☒	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☐ No; ☒ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:
Dogfish creek enters the bay. Lots of 2 dead/empty mussels in bag 841, 2 dead + empty in 844, 2 dead + empty in 843, all live in 847

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☒ Commercial; ☐ Industrial; ☐ Major road/highway; ☒ Park; ☒ Public access;
☐ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 70 % shoreline armored; Materials used: Concrete

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

not that I could see in the dark!

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☒ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☒ Other: Park

Dock/pier/wharf material: ☐ Creosote ☒ Other treated wood; ☐ Concrete; ☐ Steel; ☒ Other: vinyl planks

Piling/dolphin material: ☒ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: 10" (i.e. mouth diameter);
Type: Pipe, steel/concrete Condition: good

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
Out in front of stairs next to blue church

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
Out in front of stairs next to blue church. Tide appeared to be @ different point than on site eval visit. Ebb v. flood? Pretty flat in vicinity, tide moves quickly

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: 29	Site Name: Liberty Bay		
Bag numbers: 843	841	844	847
Retriever name(s): Elizabeth Unsell			
Recorder name: "			
Retrieval date: 2-5-16	Time cage removed: 8:09 PM		
Cage GPS location (decimal degrees)	Latitude: 47.73745	Longitude: 122.65073	Accuracy (± XX feet): 17.5
GPS make/model or app name: (must be set to datum NAD83) Garmin 72H			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):
Cage sink 2" into substrate

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DEPLOYMENT INFORMATION

te ID: PSS13175-000030	Site Name: KITSAP STREET Boat launch		
Bag numbers:	759	756	757	755
Deployer name(s): MIKE BEHRENS			
Recorder name: CYNDY DILLON			
Deployment date: 10/27/15	Time cage anchored: 2211		
Cage GPS location (decimal degrees)	Latitude: 47.54156	Longitude: 122.64034	Accuracy (± XX feet): 14
GPS make/model or app name: (must be set to datum NAD83) GARMIN ETREX VENTURE			
Anchors - type/number used: EARTH ANCHOR			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☑ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☑ Sheltered

Time of most recent LOW tide: 2355 **Height of most recent LOW tide (feet):** -1.71

Precipitation: ☑ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☑	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☑	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☑ Eelgrass; ☐ Kelps; ☐ Fucus; ☑ Ulva; ☐ Other

Natural streams/rivers present: ☑ No; ☐ Yes; Natural spring/freshwater seep: ☑ No; ☐ Yes

Other habitat comments/observations:
BOAT LAUNCH

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☑ Park; ☑ Public access;
☐ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☑ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☑ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☑ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☑ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☑ Steel; ☐ Other:

Tires present: ☑ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: NONE Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: NONE Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: NONE Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
CLOCK TOWER, PUBLIC LAUNCH, END OF KITSAP ST
SHELLFISH FISHING CLOSED
NUMEROUS DEAD CRABS

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PSS 13175-30	Site Name: Kitsap Street, Port Orchard		
Bag numbers:	757	755	756	759
Retriever name(s): Michael Behrens, Steve Troyer			
Recorder name: Michael Behrens			
Retrieval date: 2/10/16	Time cage removed: 11:05 PM		
Cage GPS location (decimal degrees)	Latitude: 47.54154	Longitude: 122.64033	Accuracy (± XX feet): ±11ft
GPS make/model or app name: (must be set to datum NAD83) Etrex Legend			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
None

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): No damage or fouling of the cage. 3 small (<1in carapace) Pugettia in cage.

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DEPLOYMENT INFORMATION

Site ID: PSS13175-000031	Site Name: Eastsound Fishing Bay		
Bag numbers:	508	568	560	578
Deployer name(s): Barbara Bentley, Marta Branch, Cheryl Kumer			
Recorder name: Barbara Bentley			
Deployment date: 10-26-15	Time cage anchored: 11:40pm		
Cage GPS location (decimal degrees)	~~Latitude~~: Long 122°54' 38.12"	~~Longitude~~: Lat 48° 4 37.92	Accuracy (± XX feet):
GPS make/model or app name: (must be set to datum NAD83) Google Earth			
Anchors - type/number used: screw anchor = 1 rebar = 3			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☒ Sheltered

Time of most recent LOW tide: 11:40pm **Height of most recent LOW tide (feet):** 0

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐ | Cobble-gravel mix ☒ | Sand-gravel mix ☐ | Sand ☐ | Sand-mud mix ☐ | Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐ | 1 - 20% ☒ | 20 - 40% ☐ | 40 - 60% ☐ | 60 - 80% ☐ | 80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☒ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☒ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☒ None;

☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: County Park

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☐ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
none

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PSS 13175 000031	Site Name: Orcas Eastsound Fishing Bay			
Bag numbers:	508	568	560	578
Retriever name(s): Marta Branch, Barbara Bentley, Cheryl Kummer - MRC Sanitvan				
Recorder name: Marta Branch				
Retrieval date: 2/5/16		Time cage removed:	8:55 PM (20:55)	
Cage GPS location (decimal degrees)	Latitude:	Longitude:	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)				

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
NO

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):
3 of Mussel bags grew bissel threads together. No changes around cage; no predators observed - (~~starfish~~, etc) seastars

CAGE LOST

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PSS13175-000034 **DEPLOYMENT INFORMATION** Elliott Bay

Site ID: Crowley Harbor Is.	Site Name: Harbor Is. Pier 17		
Bag numbers:	834	836	837	839
Deployer name(s): Jim West			
Recorder name: Jim West			
Deployment date: 10/26/15	Time cage anchored: 22:35		
Cage GPS location (decimal degrees)	Latitude: will get at retrieval	Longitude:	Accuracy (± XX feet):
GPS make/model or app name: (must be set to datum NAD83)			
Anchors - type/number used: Concrete block + 3 rebar set horizontally into jetty rocks			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☒ Sheltered

Time of most recent LOW tide: ebbing ~22:50 **Height of most recent LOW tide (feet):** -2 ft

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan* ☒	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☐ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☐ Yes

Other habitat comments/observations:

* jetty - basalt boulders / rocks

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☒ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☐ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☐ No; ☒ Yes, type/makeup: pilings w/in 10m

Creosote-treated

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☒ Breakwater; ☒ Dock/pier/wharf; ☐ Floating home; ☒ Marina; ☒ Mooring buoy; ☐ Outfall; ☒ Piling/dolphin; ☐ Raft/float; ☒ Road; ☒ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☒ Creosote ☐ Other treated wood; ☒ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☒ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PSI13175-000034	Site Name: HARBOR IS. PIER 17		
Bag numbers:			
Retriever name(s): Jim West			
Recorder name:			
Retrieval date: 2/9/2016	Time cage removed:		
Cage GPS location (decimal degrees)	Latitude:	Longitude:	Accuracy (± XX feet):
GPS make/model or app name: (must be set to datum NAD83)			
ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?			
Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): Cage was not there.			

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DEPLOYMENT INFORMATION

te ID: PSS13175-000035	Site Name: Williams Olson Park		
Bag numbers:	693	706	708	702
Deployer name(s): Maradel Gale, Elise Christ, Katie Kennedy			
Recorder name: Maradel Gale			
Deployment date: 26 Oct 2015	Time cage anchored: 9:45 pm		
Cage GPS location (decimal degrees)	Latitude: 47.39157 N	Longitude: -122.3401 W	Accuracy (± XX feet):
GPS make/model or app name: (must be set to datum NAD83)	Garmin Oregon 550		
Anchors - type/number used:	helical + rebar (3)		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☒ Sheltered

Time of most recent LOW tide: 10:55 pm **Height of most recent LOW tide (feet):** -0.8

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☐ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☐ Yes

Other habitat comments/observations:

unsure what is coming through pipe at top of beach — may be a natural seep channeled there or rainwater runoff

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☒ Park; ☐ Public access;
☒ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☒ Soft (plantings, large woody debris, etc.) - 0 % shoreline armored (↑ creosote in armoring?)

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☒ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☒ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☒ Creosote ☒ Other treated wood; ☐ Concrete; ☐ Steel; ☒ Other: Tire floatation

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: 12" diam (i.e. mouth diameter);
Type: black PVC Condition: reasonable - fairly new

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: 000035		Site Name: Williams-Olson Bainbridge		
Bag numbers:	708	693	702	706
Retriever name(s): Maradel Gale				
Recorder name: Elise Wright				
Retrieval date: 7 Feb 2016		Time cage removed: 9:10 AM		
Cage GPS location (decimal degrees)	Latitude: 47.664786	Longitude: -122.5688144	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)				
ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?				
Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):				

LOST CAGE

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DEPLOYMENT INFORMATION

Site ID: PSS13175 - 000036	Site Name: Ediz Hook		
Bag numbers:	884	888	878	880
Deployer name(s): Burt Foote, Jim Federly, Rick Johns Jack Marshall			
Recorder name: Rick Johns			
Deployment date: 10/27/15	Time cage anchored: 8 pm		
Cage GPS location (decimal degrees)	Latitude: 48 08 526	Longitude: 123 25575	Accuracy (± XX feet): 5 ft
GPS make/model or app name: (must be set to datum NAD83)	Garmin ETrex 10		
Anchors - type/number used:	2 augers 3 rebar, 2 cinder blocks		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 09:41 pm **Height of most recent LOW tide (feet):** ~0.99

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☒ Park; ☒ Public access;
☐ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other Coast Guard to east - no access

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: boulders

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☒ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
15-20 FT OUT FROM LARGE RED ROCK

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name:		
Bag numbers:				
Retriever name(s):				
Recorder name:				
Retrieval date:		Time cage removed:		
Cage GPS location (decimal degrees)	Latitude:	Longitude:	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)				
ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?				

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): WE WENT BACK FEB 6, 2016 TO RETRIEVE THE CAGE BUT IT WAS GONE. WE CHECKED THE BEACH ABOUT 200-300 FT ON BOTH SIDES OF THE DEPLOYMENT LOCATION AND FOUND NOTHING

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DEPLOYMENT INFORMATION

.te ID: PSS13175-000037	Site Name: SALTER'S PT – STEILACOOM		
Bag numbers:	·659	·638	·636	·647
Deployer name(s): (NISQ RCH NAT CNTR)	Yvonne & Kurt Shevalier, Stephanie Lewis, David Low, Sandy Zeiner		
Recorder name:	Sandy Zeiner		
Deployment date:	10/26/2015	Time cage anchored:	2145
Cage GPS location (decimal degrees)	Latitude: 47.17 025°N	Longitude: -122.610 76°W	Accuracy (± XX feet): 9'
GPS make/model or app name: (must be set to datum NAD83)	Garmin Etrex 10 (KEPT @ NISQ RCH NAT CNTR)		
Anchors - type/number used:	Rebar = 3 + Helical		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: **Height of most recent LOW tide (feet)**: Ø'

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:
Lots of Barnacles

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☒ Park; ☒ Public access;
☒ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☒ Other Train Track

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: Rock

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

.oandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☒ Other: Bridge over tracks S. of site

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☒ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other: NONE

Tires present: ☒ No; ☐ Yes - Estimated Number: — Used for: —

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: — Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: — Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: — Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
Train tracks

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
→ West down from Flag Pole; → street light on "Martin St & 2nd St." corner S. OF FLAGPOLE (photo)
→ LANDMARK N. OF CAGE IS CITY SKYLINE OF STEILACOOM (photo); → LANDMARK S. OF CAGE IS OUTFALL OF GRAVEL PLANT IN DU[illegible]T (PHOTO)

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations! YS

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PSS13175-000037 Site Name: SALTER'S PT - STEILACOOM

Bag numbers:	636	659	647	638

Retriever name(s): Yvonne & Kurt Shevalier, Stephanie Lewis, David Law, Sandy Zeiner

Recorder name: Sandy Zeiner

Retrieval date: 2/9/16 Time cage removed: 2253

Cage GPS location (decimal degrees)	Latitude: SAME AS DEPLOYMENT	Longitude:	Accuracy (± XX feet):

GPS make/model or app name:
(must be set to datum NAD83)

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
None

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): Cage - clean, no damage -

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DEPLOYMENT INFORMATION

Site ID: PSS13175-000038	Site Name: Rocky Point		
Bag numbers:	739	626	629	723
Deployer name(s): Elizabeth Unsell			
Recorder name: Elizabeth Unsell			
Deployment date: 10/26/15	Time cage anchored: 10:50PM		
Cage GPS location (decimal degrees)	Latitude: 47.60255	Longitude: 122.66997	Accuracy (± XX feet): 16.7
GPS make/model or app name: (must be set to datum NAD83) Garmin GPS 72H			
Anchors - type/number used: 2 cinder blocks, 1 helical anchor (not very deep)			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☒ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: | **Height of most recent LOW tide (feet):**

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:
Cage was deployed in cobble/grave/sand, but is very near bedrock/hardpan clay. 1 dead in bag 626, 1 dead in bag 629, 1 dead in bag 723, all live in bag 739

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply): (not sure about rural v urban. Not high rises, but no open space either)

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☒ Rural residential; ☐ Undeveloped; ☒ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: concrete, riprap

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: 8 (i.e. mouth diameter);
Type: drainage Condition: good

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
I think there are additional drainages, but don't want to disturb neighbors walking around @ night.

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:	38	Site Name:	Rocky Point	
Bag numbers:	629	739	723	626
Retriever name(s):	Elizabeth Unsell			
Recorder name:	"			
Retrieval date:	2-5-16	Time cage removed:	9:15 PM	
Cage GPS location (decimal degrees)	Latitude: 47.60256	Longitude: 122.66994	Accuracy (± XX feet): 19.7	
GPS make/model or app name: (must be set to datum NAD83)	Garmin 72H			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):
perfect condition

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DEPLOYMENT INFORMATION

te ID: 39 BS513175-000039	Site Name: Pier 91, Smith Cove		
Bag numbers:	737	750	747 · 738
Deployer name(s): Andy Gregory, Ned Johnson, Kimby Wells,			
Recorder name: Kathryn Davis			
Deployment date: 10/26/2015	Time cage anchored: 10:00pm		
Cage GPS location (decimal degrees)	Latitude: 47.632314	Longitude: -122.378686	Accuracy (± XX feet): +/- 5m
GPS make/model or app name: (must be set to datum NAD83)	Handy GPS		
Anchors - type/number used:	helical anchor + 3 rebar		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☑ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☑ Sheltered

Time of most recent LOW tide: 1022 / 2255 **Height of most recent LOW tide (feet):** 3.0 / -0.8

Precipitation: ☑ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☑	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☑	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☑ Other Sea Lettu

Natural streams/rivers present: ☑ No; ☐ Yes; Natural spring/freshwater seep: ☑ No; ☐ Yes

Other habitat comments/observations:
- baby harbor seal on beach
- wild mussels present

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☑ Commercial; ☑ Industrial; ☑ Major road/highway; ☐ Park; ☐ Public access;
☐ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☑ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: large rocks/riprap

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☐ No; ☑ Yes, type/makeup: large, metal-boat hull?

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☑ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☑ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☑ Creosote ☑ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☑ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☑ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: 12" wide (i.e. mouth diameter);
Type: CSO Condition: active

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
- cruise terminals, railroad, large metal debris, trash
- between 2nd & 3rd light pole from outfall

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
located near Pier 91 sign - 30m southwest
- 2 mussels dead - one in bag 747 & one in 738

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name:		
Bag numbers:	737	750	747	738
Retriever name(s): ANDY GREGORY, WED JOHNSON				
Recorder name: ANDREW NUTZHORN				
Retrieval date: 09 FEB 16		Time cage removed: 23:17		
Cage GPS location (decimal degrees)	Latitude: 47° 37.9456'N	Longitude: -122° 22.7174'W	Accuracy (± XX feet): +/- 5m	

GPS make/model or app name:
(must be set to datum NAD83) WGS84 HANDY GPS

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
N/A

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): CAGE IN GOOD CONDITION, UNDAMAGED. HABITAT UNDISTURBED SINCE CAGE PLACEMENT.

LOST CAGE

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DEPLOYMENT INFORMATION

ite ID: PSS13175-000040	Site Name: Fort Worden Beach		
Bag numbers:	895	887 2dead	893	881
Deployer name(s):	Liz + Charley Kanieski, Aaron Walter		
Recorder name:	Liz Kanieski		
Deployment date:	Oct. 27, 2015	Time cage anchored:	21:20 (9:20 pm)
Cage GPS location (decimal degrees)	Latitude: 48°7.85'N	Longitude: 122°45.73'W	Accuracy (± XX feet): ?
GPS make/model or app name: (must be set to datum NAD83)	App: GPS Status		
Anchors - type/number used:	Auger, 3 rebar, cinderblock		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 10:13 am **Height of most recent LOW tide (feet):** 3.7 ft.

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☐ Yes

Other habitat comments/observations:

Beautiful full moon

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☒ Park; ☒ Public access;
☐ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☒ None;

☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

oandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

None

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name: Fort Worden Beach		
Bag numbers:				
Retriever name(s): Charlie Kanieski, Katie Conroy, Carolyn Woods				
Recorder name:				
Retrieval date: 2-5-2016		Time cage removed:		
Cage GPS location (decimal degrees)	Latitude:	Longitude:	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)				
ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?				
Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): Mussel cage gone. Did not Retrieve				

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DEPLOYMENT INFORMATION

.te ID: PSS13175-000042	Site Name: Evergreen Rotary Park		
Bag numbers:	631	850	845 / 851
Deployer name(s):	Luke Kelly		
Recorder name:	Luke Kelly		
Deployment date:		Time cage anchored:	
Cage GPS location (decimal degrees)	Latitude: 47.57551	Longitude: 122.62801	Accuracy (± XX feet): +/- 9'
GPS make/model or app name: (must be set to datum NAD83)	Garmin GPSmap 76Cx		
Anchors - type/number used:	1 x helix 2 x rebar		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☒ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 10:40 AM **Height of most recent LOW tide (feet):** 2.96'

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☒	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☒ Kelps; ☐ Fucus; ☒ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ~~☐ Yes;~~ Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:

There is a ~30" concrete culvert just 12' to south of cage at same elevation (0' tide). Appeared to have some light discharge, but that is TBD.

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☒ Major road/highway; ☒ Park; ☒ Public access;
~~☒ Rural residential~~; ☐ Undeveloped; ☒ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 75+ % shoreline armored; Materials used: boulder rip rap

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

.bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☒ Boat ramp/launch; ☐ Boathouse/shed; ☒ Bridge; ☐ Breakwater; ☒ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☒ Road; ☐ Shipyard or terminal; ☐ Utilities; ☒ Other: City of Bremerton and Navy shipyard is ~ ½ mile away

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☒ Concrete; ☒ Steel; ☒ Other: Plastic floatation

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: ~30" (i.e. mouth diameter);
Type: Pipe/culvert Condition: fair (located 12' south of mussel cage)

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
Park waterfront. So, runoff from dog waste, geese (TBD?), etc.

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: 42	Site Name: Evergreen Rotary Park			
Bag numbers:	845	850	851	631
Retriever name(s): Elizabeth Unsell				
Recorder name: "				
Retrieval date: 2-5-16	Time cage removed: 10:10			
Cage GPS location (decimal degrees):	Latitude: 47.57550	Longitude: 122.62799	Accuracy (± XX feet): 11.7	
GPS make/model or app name: (must be set to datum NAD83) Garmin 72H				

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):
good condition

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DEPLOYMENT INFORMATION

Site ID: PS513175-000043	(one shell empty)	Site Name: N Ave. Park	(1 shell open)	(1 shell empty)
Bag numbers:	570	581	567	573

Deployer name(s): Timothy Manns + Brenda Cunningham

Recorder name: Timothy Manns

Deployment date: Oct. 26, 2015 | Time cage anchored: 21:40

Cage GPS location (decimal degrees)	Latitude: N 48.52105	Longitude: W-122.61526	Accuracy (± XX feet): ±9 feet

GPS make/model or app name: Garmin Etrex 30x
(must be set to datum NAD83) ✓

Anchors - type/number used: screw + 3 rebar stakes

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves
Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☒ Sheltered

Time of most recent LOW tide: 9:47 Am | **Height of most recent LOW tide (feet):** 3.0'

Precipitation: ☐ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail ✓Mist

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☒ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):
☐ Agricultural; ☐ Commercial; ☒ Industrial; ☐ Major road/highway; ☒ Park; ☒ Public access;
☐ Rural residential; ☐ Undeveloped; ☒ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None; (Concrete bulkhead nearby but not directly above cage site)
☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____
☑ Soft (plantings, large woody debris, etc.) - 100 % shoreline ~~armored~~ (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)
☐ No; ☑ Yes, type/makeup: Creosote pilings

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☑ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☑ Outfall; ☑ Piling/dolphin; ☐ Raft/float; ☐ Road; ☑ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☑ Creosote ☐ Other treated wood; ☑ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☑ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: 18" (i.e. mouth diameter);
Type: plastic Condition: good Not flowing.

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
Note: the deployment site itself is an undeveloped beach (public park). There is commercial/industrial development to either side (photos available)

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
There are old pilings offshore (approx. 30 feet and more from the cage) Facing the water, to the right is a large industrial/commercial dock supported by creosote pilings.

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PSS13175-000043	Site Name: N Avenue Park		
Bag numbers:	573	567	581	570
Retriever name(s): Timothy Manns + Brenda Cunningham			
Recorder name: " " (GPS reading by Brenda Cunningham)			
Retrieval date:	Time cage removed: 19:40		
Cage GPS location (decimal degrees)	Latitude: N 48.52105	Longitude: W-122.61527	Accuracy (± XX feet): ± 12 feet
GPS make/model or app name: Garmin etrex 30x (must be set to datum NAD83)			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
None

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): The cage was intact and in good condition with a minimal accumulation of algae. There were several inches of sand in the bottom.

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DEPLOYMENT INFORMATION

Site ID: PSS1375-000046	Site Name: Apple Tree Cove		
Bag numbers:	599	593	594	601
Deployer name(s):	Katie Ochler, Elizabeth Thackaberry, David Toth		
Recorder name:	David Toth		
Deployment date:	10/26/2015	Time cage anchored:	21:49
Cage GPS location (decimal degrees)	Latitude: 47° 47.238'N	Longitude: -122° 29.682'W	Accuracy (± XX feet):
GPS make/model or app name: (must be set to datum NAD83)	GPS Status for Android 5.3.111		
Anchors - type/number used:	1-helical 3-rebar -		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☒ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 10:17am **Height of most recent LOW tide (feet):** 2'11"

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☒	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☒

Type of aquatic vegetation present: ☐ None; ☒ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☐ No; ☒ Yes; Natural spring/freshwater seep: ☐ No; ☒ Yes

Other habitat comments/observations:

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☒ Rural residential; ☒ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 40 % shoreline armored; Materials used: riprap, large stone

☒ Soft (plantings, large woody debris, etc.) - 60 % shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☐ No; ☒ Yes, type/makeup: few remains of old dock and road - pilings, some concrete

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☒ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☒ Dock/pier/wharf; ☐ Floating home; ☒ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: Kingston ferry

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other: NA

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other: NA

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: 8 ft (i.e. mouth diameter); Lat: 47°47.156'N
Type: Creek #1 Condition: murky, slow flow Lon 122°29.714'W

Outfall (pipe, culvert, point of flow onto beach): Size: 2½ ft (i.e. mouth diameter); Lat: 47°47.165'N
Type: Creek #2 Condition: free flowing, clear Lon: 122°29.754'W

Outfall (pipe, culvert, point of flow onto beach): Size: 4 inch each (i.e. mouth diameter);
Type: Drain Pipes (2) Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
- Marina (Kingston) - Shipping Traffic - Boat launch
- Ferry Terminal (Kingston) - Fueling Dock

All located across Apple Tree Cove

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
- Local homes on South side of Apple Tree Cove are on Septic Systems
- Directly off boathouse/creek #1 (location of Cage)

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PSS13175-000046		Site Name: Apple Tree Cove		
Bag numbers:	593	594	601	599
Retriever name(s):	David Toth, Sarah Rogers			
Recorder name:	David Toth			
Retrieval date: 2/9/2016		Time cage removed: 1222		
Cage GPS location (decimal degrees)	Latitude: 47° 47.247'N	Longitude: 122° 29.677'W	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)	GPS Status for Android V. 6.1.133			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
None

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): tags of 601 & 599 were found detached upon arrival

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DEPLOYMENT INFORMATION

PSS13175-CCC047 Cherry Point Ag. Reserve,

Site ID: SITE 47	Site Name: BIRCH BAY South		
Bag numbers:	904	907	873	903

Deployer name(s): PAUL GRABAU, KIM CARLTON & LYNDSEY NEEDHAM

Recorder name: KIM CARLTON

Deployment date: 10/27/2015 | Time cage anchored: 10:54pm (22:54)

~~Cage~~ Rock GPS location (decimal degrees)	Latitude: 48°53.728 GARMIN GPSMAP 60CSX; 48°53.727 ROCK	Longitude: 122°46.927; 122 46.927 10/27/15	Accuracy (± XX feet): ±9 ft GARMIN; ±9.84 ft; ±9 ft Kim's Samsung S4

GPS make/model or app name: GPS ESSENTIALS

(must be set to datum NAD83) CAGE LOCATION: N48°53.738' ~~100~~ W122°46.949' Kim's Samsung S4

Anchors - type/number used: 3 - REBAR + 1 HELICAL

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☒ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 10:30pm (22:30) **Height of most recent LOW tide (feet):** 0

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☒	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☒ Other Brown/red algae

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:

LARGE ROCKS, COBBLE, GRAVEL W/SOME SAND COVERED IN BARNACLES

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☒ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 92 % shoreline armored; Materials used: Concrete 30 ft @ northern boundary w/ 2 stair cases

☒ Soft (plantings, large woody debris, etc.) - 35 % shoreline armored (↑ creosote in armoring?) NO

LARGE ROCKS

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☒ Other: RESIDENTIAL BEACH ACCESS

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other: NONE

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other: NONE

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter); NONE OBSERVED
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
LARGE GRANITE ROCK ~ 15' FROM ~~SHORE~~ HILLSIDE w/ 48° 53.727 122° 46.927
4' tall x 4.5' wide.

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: Site 47 PSS13175-000047	Site Name: SITE 47 - 6961 BIRCH BAY DRIVE			
Bag numbers:	873	904	907	903
Retriever name(s): PAUL GIRABAU, LYNDSEY NEEDHAM				
Recorder name: LYNDSEY NEEDHAM				
Retrieval date: 2/8/2016		Time cage removed: 09:05pm		
Cage GPS location (decimal degrees)	Latitude: 48.89576 N ← Paul 48° 53.738' N	Longitude: 122.78247W ↑ Paul 122° 46.949' W	Accuracy (± XX feet): ±9.84 FEET	KIM'S SAMSUNG APP
GPS make/model or app name: Polaris Navigation App - Paul (must be set to datum NAD83) KIMS ~~SU~~ SAMSUNG APP				
ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)? NO				
Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): NONE				

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DEPLOYMENT INFORMATION

Site ID: PSS13175-000048	Site Name: Naketa Beach: Mukilteo		
Bag numbers:	760 - 1 open mussel	754 - ~~1 open mussel~~	917	936 - 1 open mussel
Deployer name(s): Paul Clampitt, Mike Ehlbract, Kathleen Herrmann, Autum Moore			
Recorder name: Kathl			
Deployment date: 10-27-15	Time cage anchored: 10:10 PM		
Cage GPS location (decimal degrees)	Latitude: 47.92779	Longitude: -122.30929	Accuracy (± XX feet): ± 30 ft
GPS make/model or app name: (must be set to datum NAD83)	(47°55'40" N 122 18'34" W - WA 84)		
Anchors - type/number used: rebar			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 11:12 am **Height of most recent LOW tide (feet):**

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☒	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☒ Fucus; ☒ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations: Beach looks pretty healthy eventhough in front of railroad, lots of crabs, cockles, etc

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☐ Rural residential; ☐ Undeveloped; ☒ Urban residential; ☒ Other Major railroad | BNSF

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: stone prism

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

.bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☒ Boat ramp/launch (nearby ~1/4 mile); ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☒ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: N/A Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: N/A Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: N/A Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
none

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
There is small pipe fragment embedded in concrete that is immediately visable at low tide.
Bag # 936 & 760 had one open mussel in each

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: Naketa Beach | Site Name: Naketa Beach

Bag numbers:

Retriever name(s): Kathleen Herrmann & Jennifer Lanksbury

Recorder name: Kathleen

Retrieval date: 2-5-16 | Time cage removed: 7:50 pm

Cage GPS location (decimal degrees) | Latitude: | Longitude: | Accuracy (± XX feet):

GPS make/model or app name:
(must be set to datum NAD83)

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
NO

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): Dangerous for volunteers, have to cross 2 sets of Railroad tracks, derelict iron pipes on beach, high energy environment, had to cross down very steep path, cross RR tracks on foot & go behind house backyards & thru down a boat ramp then 1/3 mile walk.

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PSS13175-000049 DEPLOYMENT INFORMATION

te ID: PSS13175-049	Site Name: Gig Harbor - Donkey Creek Delta		
Bag numbers:	928	926	930	925
Deployer name(s): Stena Troyer & Franco Ramos			
Recorder name: Stena Troyer			
Deployment date: 10-27-15	Time cage anchored: 10:40 pm		
Cage GPS location (decimal degrees)	Latitude: 47.33784	Longitude: 122.59021	Accuracy (± XX feet): ±11 ft
GPS make/model or app name: (must be set to datum NAD83)	etrex Legend		
Anchors - type/number used:	1 anchor & 3 rebar		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☒ Sheltered

Time of most recent LOW tide: 11:59 pm **Height of most recent LOW tide (feet):** -1.69 ft

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☒ gravel-mud	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☒ Ulva; ☐ Other

Natural streams/rivers present: ☐ No; ☒ Yes; more than 2004 Natural spring/freshwater seep: ☐ No; ☐ Yes

Other habitat comments/observations:
lots of empty shells - goose & killdeer calls in the night
graceful crabs galore
mussels smelled odd...

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☒ Commercial; ☐ Industrial; ☐ Major road/highway; ☒ Park; ☐ Public access;
☐ Rural residential; ☐ Undeveloped; ☒ Urban residential; ☒ Other Creek

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 80 % shoreline armored; Materials used: concrete - wood

☒ Soft (plantings, large woody debris, etc.) - 10 % shoreline armored (↑ creosote in armoring?)

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☒ Dock/pier/wharf; ☐ Floating home; ☒ Marina; ☐ Mooring buoy; ☒ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☒ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

? Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☒ Other: unknown wood

look Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☒ Other: unknown wood

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: ~6 in (i.e. mouth diameter);
Type: plastic Condition: good

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
parking lot, yard runoff, dock activities

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
walk straight out from soft armoring to pea gravel spit ~25m from parking lot bulkhead

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name: Gig Harbor	
Bag numbers:	926	928	930	925
Retriever name(s): Michael Behrens, Stena Troyer			
Recorder name: Michael Behrens			
Retrieval date: 2/11/16		Time cage removed: 12:15 AM	
Cage GPS location (decimal degrees)	Latitude: 47.33784	Longitude: 122.59023	Accuracy (± XX feet): +11 ft
GPS make/model or app name: (must be set to datum NAD83) Etrex Legend			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
No

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): No damage or fouling of the cage. No evidence of stars or crabs in the cage

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Option 2
Pierce County

DEPLOYMENT INFORMATION

ID: PS13175-000061	Site Name: Dash Point Park		
Bag numbers:	728	731	607	~~609~~ 610 (2/2/16)
Deployer name(s):	Hans, Shuhui, Jared		
Recorder name:	Hans Hunger		
Deployment date:	10/26/2015	Time cage anchored:	10:08
Cage GPS location (decimal degrees)	Latitude: 47.31965° N	Longitude: -122.42694° W	Accuracy (± XX feet): ±10ft
GPS make/model or app name: (must be set to datum NAD83)	GPS Status (App) Android phone		
Anchors - type/number used:	orange auger & zip tied to 3rd pier.		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☒ Sheltered

Time of most recent LOW tide: 10:27 am **Height of most recent LOW tide (feet):** +2.93 ft.

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Rock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:
Lots of clams and crabs under the pier.

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):
☐ Agricultural; ☑ Commercial; ☐ Industrial; ☐ Major road/highway; ☑ Park; ☑ Public access;
☐ Rural residential; ☐ Undeveloped; ☑ Urban residential; ☐ Other At Dash Point State Park

Erosion control structures (i.e. armoring of shoreline): ☐ None;
☑ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: Concrete, riprap
☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

andoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)
☐ No; ☑ Yes, type/makeup: Remnants of old concrete pier on beach

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☑ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☑ Mooring buoy; ☑ Outfall; ☑ Piling/dolphin; ☐ Raft/float; ☑ Road; ☐ Shipyard or terminal; ☑ Utilities; ☐ Other: Parking lot, electrical attached to pier

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☑ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☑ Concrete; ☐ Steel; ☐ Other:

Tires present: ☐ No; ☑ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: 12" (i.e. mouth diameter);
Type: Condition: Buried

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: Concrete pipe Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: 6" (i.e. mouth diameter);
Type: HDPE Condition: Buried

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PS13175-000061	Site Name: Dash point park			
Bag numbers:	728	731	607	609
Retriever name(s): Jeff Barney, Shuhui Dun				
Recorder name: Shuhui Dun				
Retrieval date: 2/6/2016	Time cage removed: 2027 Hr			
Cage GPS location (decimal degrees)	Latitude: N 47°19' 9.5088"	Longitude: W 122°25' 37.6356"	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)	App: Map Coordinates			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

No

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):

clear, Calm, 44°F

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Option 2
Pierce County

DEPLOYMENT INFORMATION

.e ID: PSS13175-000161	Site Name: Purdy - Dexters		
Bag numbers:	726	727	622	633
Deployer name(s):	Rob Wiseman Monty Erath		
Recorder name:	Rob W		
Deployment date:	10-26-15	Time cage anchored:	10:42
Cage GPS location (decimal degrees)	Latitude: 47.385458	Longitude: -122.627255	Accuracy (± XX feet): ± 3 meters
GPS make/model or app name: (must be set to datum NAD83)	47 34x 34	GPS Development.com (Compass/GPS app for smart phone)	
Anchors - type/number used:	Rebar Stakes		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 10:59 am **Height of most recent LOW tide (feet):** +3.10

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail raining earlier

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

ɜdrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☒	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☐ No; ☒ Yes; Natural spring/freshwater seep: ☐ No; ☐ Yes

Other habitat comments/observations:

Small estuary, associated with Purdy Creek. at zero tide, salt water completely drained from estuary leaving only creek channel.

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☑ Commercial; ☐ Industrial; ☑ Major road/highway; ☐ Park; ☐ Public access;
☑ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: concrete rock

☐ Soft (plantings, large woody debris, etc.) - ~~100~~ % shoreline armored (↑ creosote in armoring?)

.bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☐ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☑ Other: Behind commercial strip mall, near commercial shellfish

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☐ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: Purdy PSS13175-00016	Site Name: Purdy - Dexters		EV 2/6/16	CV 2/6/16
Bag numbers:	622	633	7627	7626
Retriever name(s):	Rob Wenman, Carla Vincent			
Recorder name:	~~CB~~ Wenman, Carla Vincent			
Retrieval date:	2/6/16	Time cage removed:	20:20	
Cage GPS location (decimal degrees)	Latitude: 47.385668	Longitude: -122.627728	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)	Google Earth			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

No

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):

~~Stro~~ Creek has now moved closer to cage!
Cage suspended 1ft above creek bed

CAGE LOST

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Option 2 Pierce County

DEPLOYMENT INFORMATION

e ID: PSS 13175-000185	Site Name: Browns Point Park		
Bag numbers:	749	725	612	606
Deployer name(s): SHELLY EISENBARTH / TOM KANTZ / TODD ESSMAN			
Recorder name: TODD ESSMAN			
Deployment date: 10/26/15	Time cage anchored: 10:16 pm		
Cage GPS location (decimal degrees)	Latitude: 47.30514 N	Longitude: -122.44435 W	Accuracy (± XX feet):
GPS make/model or app name: (must be set to datum NAD83)	I-PHONE Google Earth		
Anchors - type/number used: 4 REBAR W/ 1 CINDER BLOCK			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 10:27 am **Height of most recent LOW tide (feet):** +2.93 ft.

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

drock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☒ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☑ Park; ☑ Public access;
☐ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☑ Hard (bulkhead, riprap, etc.) - 50 % shoreline armored; Materials used: Concrete, riprap

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

andoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☑ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☑ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☑ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☑ Other: Radio frequency tower near sample pte.

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☐ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.): Boat ramp (concrete) on Browns Point Improvement Club parcel to south of site.

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
CAGE SET STRAIGHT OUT FROM END OF WHITE FENCE LINE. ≈ 150'

CAGE WAS DETACHED & FOUND ON SHORE. DISPOSED OF SAMPLE
11/29/16. - CV

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name:		
Bag numbers:				
Retriever name(s):				
Recorder name:				
Retrieval date:		Time cage removed:		
Cage GPS location (decimal degrees)	Latitude:	Longitude:	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)				
ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?				
Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):				

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Option 2
Pierce County

DEPLOYMENT INFORMATION

Site ID: PSS13175-000353	Site Name: Purdy - Nicholson		
Bag numbers:	724	745	617	624
Deployer name(s): Corrie Lee, Mary Birchem, Tom Nelson			
Recorder name: Mary Birchem			
Deployment date: 10/26/15	Time cage anchored: 10:42		
Cage GPS location (decimal degrees)	Latitude: 47.37608 N	Longitude: -122.62493 W	Accuracy (± XX feet):
GPS make/model or app name: Google Earth (must be set to datum NAD83)			
Anchors - type/number used: 4 rebar, 1 helical anchor, 1 cinder block			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 10:59 am **Height of most recent LOW tide (feet):** +3.10

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

drock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☒ Ulva;* ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:
abundance of crabs & shrimp & sand dollars, empty & live oyster
very sandy/cobble grass
* ulva ~10ft. from cage

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☑ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☑ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: Concrete

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

andoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☑ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☑ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☑ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: 12" (i.e. mouth diameter);
Type: Concrete pipe Condition: Good

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
outfall about 10 ft. South of sampling location

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: pss13175-000353	Site Name: Purdy-Nicholson			
Bag numbers:	624	617	724	745
Retriever name(s):	Rob Wenman Carla Vincent			
Recorder name:	Carla Vincent			
Retrieval date:	2/6/16	Time cage removed:	20:50	
Cage GPS location (decimal degrees)	Latitude: 47.37607	Longitude: -122.62493	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)	Iphone - Google Earth			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
No

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):

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Option 2
Pierce County

DEPLOYMENT INFORMATION

e ID: PSS13#75-000481	Site Name: Gig Harbor - Boat Launch		
Bag numbers:	732	740	733	718
Deployer name(s):	Tiffany Odell Dave Molinaar		
Recorder name:	Tiffany Odell		
Deployment date:	10/26/15	Time cage anchored:	10:30P
Cage GPS location (decimal degrees)	Latitude: 47.33788 N	Longitude: -122.58277W	Accuracy (± XX feet):
GPS make/model or app name: (must be set to datum NAD83)	Google Earth		
Anchors - type/number used:	4 Rebar, 1 screw anchor		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☒ Sheltered

Time of most recent LOW tide: 10:49 am **Height of most recent LOW tide (feet):** +3.04

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

drock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☒	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☒ Ulva; ☒ Other Enteromorpha

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:

Enteromorpha, lots of shells

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☑ Public access;
☐ Rural residential; ☐ Undeveloped; ☑ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☑ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: Concrete

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☑ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☑ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☑ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☑ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☑ Steel; ☑ Other: Plastic decking

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☑ Steel; ☐ Other:

Tires present: ☑ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
Boats, nearby septic systems

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PSS13 #75-000481		Site Name: GIG HARBOR BOAT LAUNCH		
Bag numbers:	740	733	732	718
Retriever name(s): TIFFANY ODELL				
Recorder name: SCOTT GRACE				
Retrieval date: 06 FEB 2016		Time cage removed: 2035		
Cage GPS location (decimal degrees)	Latitude: 47.33785 N	Longitude: -122.58282 E	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83) GOOGLE EARTH / iPHONE				

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
NO

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): large dent in water side top of cage, presumably from a boat
Cage about 10-15ft from edge of water
mussels in each bag connected by fine filaments to mussels of other bags

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Option 2
Pierce County

DEPLOYMENT INFORMATION

ID: PSS13175-000625	Site Name: Gig Harbor - Mulligan		
Bag numbers:	736	742	725	729
Deployer name(s): Charlene Poggensee ; Scott Grow			
Recorder name: Charlene Poggensee ;			
Deployment date: 10/26/15	Time cage anchored: 2232		
Cage GPS location (decimal degrees)	Latitude: ~~003~~ ~~47.33.065~~ cp 10/26/15	Longitude: ~~-75.56~~ cp ~~-122.57.554~~ 10/26/15	Accuracy (± XX feet): 3-5ft
GPS make/model or app name: Ipad - Google Earth (must be set to datum NAD83)			
Anchors - type/number used: Ibolt x1; Rebar x4			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☒ Sheltered

Time of most recent LOW tide: 10:49 am **Height of most recent LOW tide (feet):** +3.04

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

drock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☒	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☒	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☒ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:
Rocky substrate covered by silt. Kelp extends ~6ft upshore from site.

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☐ Rural residential; ☐ Undeveloped; ☑ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☑ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: wood, concrete, quarry spoils

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☑ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☑ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☑ Piling/dolphin; ☑ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☑ Creosote ☐ Other treated wood; ☑ Concrete; ☑ Steel; ☐ Other:

Piling/dolphin material: ☑ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☑ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Boats.

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

Pilings on this parcel are creosote - mussel cage was not attached to pilings.

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PSS|3175-000625		Site Name: GIG HARBOR		
Bag numbers:	736	742	729	725
Retriever name(s): TIFFANY O'DELL				
Recorder name: SCOTT GROCE				
Retrieval date: 06 FEB 2016			Time cage removed: 2115	
Cage GPS location (decimal degrees)	Latitude: 47° 19.8384 N	Longitude: -122° 34.5324	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83) GOOGLE EARTH / IPHONE				

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

no

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):

Cage in good condition, much less kelp, more fine sediment

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Option 2 Pierce County

DEPLOYMENT INFORMATION

Site ID: PSS13175-000697	Site Name: Browns Point - Wolverton		
Bag numbers:	719	720	716	715
Deployer name(s): HAROLD SMELT, DOUG THOMPSON			
Recorder name: DOUG THOMPSON (253) 798-7001			
Deployment date: 10/26/15	Time cage anchored: 10:08 pm		
Cage GPS location (decimal degrees)	Latitude: 47.29824	Longitude: -122.43686	Accuracy (± XX feet):
GPS make/model or app name: (must be set to datum NAD83)	Iphone - Google Earth		
Anchors - type/number used:	4 Rebar, 2 Bricks, Helical Anchors		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 10:27 am **Height of most recent LOW tide (feet):** +2.93 ft.

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:

Residential area near port of Tacoma.

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☐ Rural residential; ☐ Undeveloped; ☑ Urban residential; ☑ Other Sewer pump stn. uphill of site

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☑ Hard (bulkhead, riprap, etc.) - 60 % shoreline armored; Materials used: Concrete, riprap

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

andoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☐ No; ☑ Yes, type/makeup: pilapidated wood shack near water

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☑ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☑ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☑ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: PSS13175-000697	Site Name: Wolverton			
Bag numbers:	716	720	719	715
Retriever name(s):	Harold Smelt Tom Kantz			
Recorder name:	Tom Kantz			
Retrieval date:	2/6/16	Time cage removed:	8:00	
Cage GPS location (decimal degrees)	Latitude: 47.29828 N	Longitude: 122.43684 W	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)	iPhone			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

no

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): Sack 719 came loose on one end and fell to bottom of cage.

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Option 2
Pierce County

DEPLOYMENT INFORMATION

Site ID: PSS13175-000953	Site Name: Browns Point-Carlson		
Bag numbers:	730	751	721	611
Deployer name(s):	Kyle Dworshak Helmut Schmidt		
Recorder name:	Kyle Dworshak Helmut Schmidt		
Deployment date: 10/26/15	Time cage anchored: 10:27 - 10:35		
Cage GPS location (decimal degrees)	Latitude: 47.3077	Longitude: -122.4352	Accuracy (± XX feet): 3 Meter
GPS make/model or app name: (must be set to datum NAD83)	Sampling Note 3 Compass GPS App		
Anchors - type/number used:	4 Rebar - 1 Screw Anchor 2 ZIP TIES (LOS)		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 10:27 am **Height of most recent LOW tide (feet):** +2.93 ft.

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☒	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☒ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☐ Yes

Other habitat comments/observations:

Crabs

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☐ Rural residential; ☐ Undeveloped; ☒ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☑ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☑ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☑ Outfall; ☑ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☑ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☑ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: 24" (i.e. mouth diameter);
Type: Concrete Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
Residential boathouses along shore

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: 953NVGA	Site Name: 953 NVGA - Browns Point Carlson			
Bag numbers:	730	751	721	611
Retriever name(s):	B. Eldridge / K. Dworshak			
Recorder name:	B. Eldridge			
Retrieval date: 2/6/2016	Time cage removed: 2010			
Cage GPS location (decimal degrees)	Latitude: 47.3077	Longitude: -122.4351	Accuracy (± XX feet): 3 M	
GPS make/model or app name: (must be set to datum NAD83)	Droid Compass GPS			
ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?	N/A			
Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):	N/A			

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DEPLOYMENT INFORMATION

Site ID: CPS_EF	Site Name: Brackett's Landing – Edmonds Ferry		
Bag numbers:	691	688	676	711
Deployer name(s): Susan Tarpley, Autumn Moore + Alan Mearns.			
Recorder name: Susan Tarpley			
Deployment date: 10/26/2015	Time cage anchored: 10:10 p.m.		
Cage GPS location (decimal degrees)	Latitude: 47.814183	Longitude: 122.382150	Accuracy (± XX feet): ± 30 ft
GPS make/model or app name: WAD 84 (Google Maps) (must be set to datum NAD83)			
Anchors - type/number used: 1 Anger + 3 rebar (1 bar started to bend)			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☒ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 10:18 am **Height of most recent LOW tide (feet):** 2.9 ft.

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒ (Attached See note below *)	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☒ Other * Not attached.

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:

At base of riprap of Brackett's Landing Jetty, north facing, at W. end of artificial tide pool. Not naturally occurring mussels observed on nrby rocks.
* Thick accumulation of algal mat along entire shoreline (up to 6-8" deep)

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☒ Park; ☒ Public access;
☐ Rural residential; ☐ Undeveloped; ☒ Urban residential; ☐ Other Railroad

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: Riprap for RR

☒ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☒ Breakwater; Brackett's Land. Jetty
☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float;
☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: Edmonds / WA DOT Ferry Terminal to South

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
Stormwater-runoff, RR, Ferry, recreational boats
Shell Creek ~0.5 mi. N. of site.

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
At W end of largest man-made tidepool on N. side of Jetty.
Public path on adjacent Jetty allows observation of cage at lower tides.

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: CPS EF		Site Name: Brackett's Landing, Edmonds		
Bag numbers:	691	688	676	711
Retriever name(s): Autumn Moore, Susan Tardey, Alan Mearns				
Recorder name: Autumn Moore				
Retrieval date: Feb 5 2016		Time cage removed: 8:00pm		
Cage GPS location (decimal degrees)	Latitude: 47.814183	Longitude: 122.382150	Accuracy (± XX feet): ±30ft	
GPS make/model or app name: (must be set to datum NAD83)	WAD84 (Google Maps)			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
NO

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): Cage incurred hit to 1 corner, creating a minor dent. Cage integrity remained strong. Hit occured on seaward side. Sizeable gap on alternate side of cage, which may have allowed prey to enter cage. Gap 1" by 3" at most.

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DEPLOYMENT INFORMATION

Site ID: CPS_HCV	Site Name: Port Madison / Hidden Cove		
Bag numbers:	700, 707, 703, 705		
Deployer name(s): CHRISTY CARR & CECILIA WALTERS			
Recorder name: CHRISTY CARR			
Deployment date: 10.26.15	Time cage anchored: 9:58P		
Cage GPS location (decimal degrees)	Latitude: 47°41'[illegible]" N	Longitude: 122°32'44" W	Accuracy (± XX feet): UNKNOWN
GPS make/model or app name: (must be set to datum NAD83)	IPhone		
Anchors - type/number used: ~~[illegible]~~	HELICAL (1) + REBAR (3)		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☒ Sheltered

Time of most recent LOW tide: | **Height of most recent LOW tide (feet):**

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☒	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations: Near Hidden Cove
#700 1 missing mussel

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☒ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;
☒ Hard (bulkhead, riprap, etc.) - 90 % shoreline armored; Materials used: ROCK
☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)
☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☒ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☒ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.): creosote pilings on adjacent dock

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
- Hidden Cove Creek ~200' to east
- Unnamed creek ~300' to west
- mapped herring spawning

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name:		
Bag numbers:				
Retriever name(s):				
Recorder name:				
Retrieval date:		Time cage removed:		
Cage GPS location (decimal degrees)	Latitude:	Longitude:	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)				
ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?				
Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):				

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DEPLOYMENT INFORMATION

te ID: CPS_MASO	Site Name: MANCHESTER Stormwater Outfall		
Bag numbers:	627	753	717	741
Deployer name(s): Renee Scherdnik Nick Scherdnik			
Recorder name: NICK SCHERDNIK			
Deployment date: 10-26-2015	Time cage anchored: 10:15 PM		
Cage GPS location (decimal degrees)	Latitude: 47.55622° ~~47.50174~~	Longitude: ~~122.54281~~ ~~122.77149~~	Accuracy (± XX feet): ~~~10FT~~
GPS make/model or app name: (must be set to datum NAD83)	(Same location as before) ~~MAGELLAN~~ ~~SPORTRAK~~ Google Maps		
Anchors - type/number used: (2) Cinder Block, (1) cement debris, (1) rock			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☒ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 10:15 PM **Height of most recent LOW tide (feet)**: 0'

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☐	20 - 40% ☐	40 - 60% ☒	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☒ Ulva; ☒ Other Green Sea Lettuce

Natural streams/rivers present: ☐ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☐ Yes

Other habitat comments/observations:

BOAT LAUNCH, STORMWATER OUTFALL 100' AWAY

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☒ Park; ☒ Public access;
☐ Rural residential; ☐ Undeveloped; ☒ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: riprap, debris, cement

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

.oandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☒ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☒ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☒ Mooring buoy; ☒ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☒ Road; ☐ Shipyard or terminal; ☒ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
At road end out from utility pole

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name: MANCHESTER		
Bag numbers:	627	753	741	717
Retriever name(s): Renee Scheridnik; Nick Scheridnik				
Recorder name: Nick Scheridnik				
Retrieval date: 2-7-16		Time cage removed: 8:55 PM		
Cage GPS location (decimal degrees)	Latitude: 47° 33.375536	Longitude: 122° 32.568250	Accuracy (± XX feet): 1.7 ft	
GPS make/model or app name: TRIMBLE G20XH (must be set to datum NAD83)				

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
No (also dock)

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): (32) sea star in cage; baby crabs

CAGE LOST

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DEPLOYMENT INFORMATION Maury Island Aq. Reserve

Site ID: CPS-MIAR	Site Name: King County Old Marine Park, Maury Island		
Bag numbers: 874	868	871	866
Deployer name(s): BD, KA, MPO			
Recorder name: MPO			
Deployment date: 10/29/15	Time cage anchored:		
Cage GPS location (decimal degrees)	Latitude: 47.37995	Longitude: 122.4017	Accuracy (± XX feet):
GPS make/model or app name: (must be set to datum NAD83)			
Anchors - type/number used: Cinderblock			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☐ Calm; ☒ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 23:30 **Height of most recent LOW tide (feet):** 0 ft

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☐ Yes

Other habitat comments/observations:

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☒ Park; ☐ Public access;
☐ Rural residential; ☒ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☒ None;

☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☐ No; ☒ Yes, type/makeup: Unknown, covered in barnacles

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: N/A

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other: N/A

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other: N/A

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition: N/A

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

0.15mi N. of the parking area. One shell empty.

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: CPS - MIAR	Site Name: Maury Island Aq. Res. - Old Marine Park			
Bag numbers:				
Retriever name(s):				
Recorder name: Jennifer Lankesbury				
Retrieval date:	Time cage removed:			
Cage GPS location (decimal degrees)	Latitude:	Longitude:	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)				
ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?				

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):

Cage found washed up on shore, badly bent up and damaged by a citizen on 11/11/2015.

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CPS_ ~~PB~~ PNP DEPLOYMENT INFORMATION			
te ID: ~~SPONSORED~~ RTP	Site Name: Point No Point		
Bag numbers:	589	585	595	590
Deployer name(s):	Rory O'Rourke, Jason Haveman		
Recorder name:	Rory O'Rourke		
Deployment date:	October 26, 2015	Time cage anchored:	1000 (2200)
Cage GPS location (decimal degrees)	Latitude: 47.90859404 °N	Longitude: 122.52674505 °W	Accuracy (± XX feet): ± 6.1 feet
GPS make/model or app name: (must be set to datum NAD83)	Trimble Geo7x		
Anchors - type/number used:	1 Earth anchor		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☒ Sheltered

Time of most recent LOW tide: **Height of most recent LOW tide (feet)**:

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☐	Sand-~~gravel~~ cobble mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☒	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☒ Eelgrass; ☐ Kelps; ☐ Fucus; ☒ Ulva; ☒ Other red algae

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☒ Yes

Other habitat comments/observations:
Beneath bluff

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☒ Park; ☒ Public access;
☒ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☒ None;

☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☒ Other: Park; boat launch distant but around point

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
Cage located on northern side of large boulder

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: SPONSORED		Site Name: Pt. No Pt.		
Bag numbers:	590	595	589	585
Retriever name(s): Rory O'Rourke, Jason Haveman				
Recorder name: Rory O'Rourke				
Retrieval date: 2/8/2016		Time cage removed: 9:54 PM		
Cage GPS location (decimal degrees)	Latitude: 47.90859	Longitude: 122.526748	Accuracy (± XX feet): 7.3 ft	
GPS make/model or app name: (must be set to datum NAD83) Trimble Geo 7x				

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
None

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):
Several kelp crab in cage

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zero
low tide = 9:30
Feb. 8

DEPLOYMENT INFORMATION

te ID: CPS_QMH	Site Name: Inner Quartermaster / Quartermaster harbor		
Bag numbers:	859	857	869	858
Deployer name(s): Bianca Perla Hooper Havenkotte			
Recorder name: Bianca Perla			
Deployment date: 10/29/2015	Time cage anchored: 11:15pm		
Cage GPS location (decimal degrees)	Latitude: 47.40518	Longitude: -122.43975	Accuracy (± XX feet): 18 ft.
GPS make/model or app name: (must be set to datum NAD83) yes	Theodolite w/ datum app for NAD83 capability		
Anchors - type/number used:	rebar 3 red screw		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☐ Calm; ☑ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☑ Sheltered

Time of most recent LOW tide: | **Height of most recent LOW tide (feet)**:

Precipitation: ☐ None; ☐ Steady rain; ☑ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☑	Mud, silt ☑

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☑	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☑ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☑ No; ☐ Yes; Natural spring/freshwater seep: ☑ No; ☐ Yes

Other habitat comments/observations:

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☑ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☑ Hard (bulkhead, riprap, etc.) - 30 % shoreline armored; Materials used: _____

☑ Soft (plantings, large woody debris, etc.) - 70 % shoreline armored (↑ creosote in armoring?)

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☑ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☑ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☐ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
In line with road sign on land bridge b/w Vashon & Maury

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name: Quartermaster harbor, Vashon		
Bag numbers:	658	857	698	858
Retriever name(s): Bianca Perla, Hooper Harenkotte				
Recorder name: Bianca Perla				
Retrieval date: Feb. 8, 2015		Time cage removed: 9:35 pm		
Cage GPS location (decimal degrees)	Latitude: 047.40521	Longitude: -122.43971	Accuracy (± XX feet): 16.4	
GPS make/model or app name: Theodolite App on iphone (must be set to datum NAD83)				

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
NO

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): It's amazing no one hit this cage at higher tide w/ a boat. We suggest marking it w/ a floating buoy lots of kayak & sailboat activity here.

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DEPLOYMENT INFORMATION

te ID: SCPS-SB	Site Name: SALMON BAY, Commodore Park		
Bag numbers:	748	734	744	722
Deployer name(s):	CHRIS WILKIE, JESS KELLY, CHRIS CADAG, JED MARSHALL SYE MSMITH SUEAG.		
Recorder name:	MARILYN SMITH		
Deployment date:	OCT 26 2015	Time cage anchored:	10:00 PM
Cage GPS location (decimal degrees)	Latitude: 47° 39 MIN 97 SEC N	Longitude: 122° 24 MIN 108 SEC W	Accuracy (± XX feet): 20 FT
GPS make/model or app name: (must be set to datum NAD83)	GALAXY S-6		
Anchors - type/number used:	helical anchor / 3 rebar		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☒ Sheltered

Time of most recent LOW tide: 10:20 AM **Height of most recent LOW tide (feet)**: 3.0

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☒	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☐ No; ☒ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations: OUTFLOW OF LAKE WASHINGTON SHIP CANAL
MAJOR NAVIGATIONAL CHANNEL
EXTENSIVE CREOSOTE PILINGS
EXTENSIVE NATIVE MUSSELS + BARNACLES

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☒ Commercial; ☐ Industrial; ☐ Major road/highway; ☒ Park; ☒ Public access;
☐ Rural residential; ☐ Undeveloped; ☒ Urban residential; ☒ Other RAILROAD BNSF / BRIDGE

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 10 % shoreline armored; Materials used: ROCK + CEMENT

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

oandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☐ No; ☒ Yes, type/makeup: RAILROAD DEBRIS + CEMENT BLOCKS

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☒ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☒ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☒ Other: SHIP CANAL

Dock/pier/wharf material: ☒ Creosote ☐ Other treated wood; ☒ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☒ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

SHIP CANAL BOATS
RAILROAD BRIDGE
POSSIBLE COAL DUST

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

Just east of BNSF Bridge, on south shore.
Approx 30 ft diagonal to the bridge abutment

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name: Salmon Bay		
Bag numbers:	722	734	744	748
Retriever name(s): Kathryn Davis, Chris Wilke, Sue Joerger				
Recorder name: Kathryn Davis				
Retrieval date: 2/9/16		Time cage removed: 11:30 pm		
Cage GPS location (decimal degrees)	Latitude: 47.666297	Longitude: -122.401853	Accuracy (± XX feet): +/- 5m	
GPS make/model or app name: (must be set to datum NAD83)	Handy GPS free (Iphone app)			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):

Slimey cage, still well anchored. Cage has not filled w/ sediment

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Mussel Monitoring Site Datasheet

DEPLOYMENT INFORMATION

Site ID: CPS_SHLB	Site Name: Shilshole		
Bag numbers: 856	653	635	645
Deployer name(s): Chris Gregersen + Carly Greyell			
Recorder name:			
Deployment date: 10/26/2015	Time cage anchored:		
Cage GPS location (decimal degrees)	Latitude: 47.67136	Longitude: 122.40654	Accuracy (± XX feet): 6'
GPS make/model or app name: (must be set to datum NAD83) Garmin etrex 20			
Anchors - type/number used:			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☒ Sheltered

Time of most recent LOW tide: **Height of most recent LOW tide (feet)**:

Precipitation: ☐ None; ☐ Steady rain; ☒ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☐ No; ☒ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations: At outlet of ship canal

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☒ Major road/highway; ☐ Park; ☒ Public access;
☐ Rural residential; ☐ Undeveloped; ☒ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: riprap

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☐ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☒ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☒ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☒ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
none

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
none

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name: Shilshole		
Bag numbers:	856	653	635	645
Retriever name(s):	Chris Gregersen, Carly Greyell			
Recorder name:	Chris Gregersen			
Retrieval date:	2/10/16		Time cage removed:	11:42
Cage GPS location (decimal degrees)	Latitude: 47.67136	Longitude: 122.40654	Accuracy (± XX feet): 6	
GPS make/model or app name: (must be set to datum NAD83)	Garmin Etrex 20			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
No new signs

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):
Cage looked great, some algae/slime growth but physically sound. A few dead mussels observed but otherwise the retrieval was a success.

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DEPLOYMENT INFORMATION

Site ID: CPS-SQSO	Site Name: Suquamish		
Bag numbers:	619	616	628	615
Deployer name(s):	Mindy Fohn + Pat Kirschbaum		
Recorder name:	Pat Kirschbaum		
Deployment date:	10/26/15	Time cage anchored:	10:15 pm
Cage GPS location (decimal degrees)	Latitude: 47.729617	Longitude: -122.550419	Accuracy (± XX feet): Google Maps
GPS make/model or app name: (must be set to datum NAD83)	Google Maps		
Anchors - type/number used:	Helical w/ zipties; 2 rebar + attached to piling w/ zipties.		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 10:30 pm **Height of most recent LOW tide (feet):**

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☒	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☒ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:
Pigeons under pier overhead of cage.

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☒ Park; ☒ Public access;
☒ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☒ None;

☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☒ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☒ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☒ Outfall; ☒ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☒ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☒ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
4th piling from shoreline

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:	Site Name: Suquamish		
Bag numbers:	615, 616, 619, 628		
Retriever name(s):	Mindy Fohn	Pat Kirschbaum	
Recorder name:	MFohn		
Retrieval date: 2/8/16	Time cage removed: 9:45pm		
Cage GPS location (decimal degrees)	Latitude:	Longitude:	Accuracy (± XX feet):

GPS make/model or app name:
(must be set to datum NAD83)

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
No

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):
Cage + mussels in excellent condition

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Mussel Monitoring Site Datasheet

DEPLOYMENT INFORMATION

EB_ME

te ID: Myrtle Edwards - Sponsored | Site Name: Myrtle Edwards - Elliott Bay

Bag numbers:	752	746	743	714

Deployer name(s): Connie Sullivan, Michele Pixon, Paul Fredrickson, Jonathan Frye, Sean Walters, Ray Timm

Recorder name: connie sullivan

Deployment date: 10/26/15 | Time cage anchored: 21:57

Cage GPS location (decimal degrees)	Latitude: 47.61862	Longitude: -122.36108	Accuracy (± XX feet): ±3m

GPS make/model or app name: (must be set to datum NAD83) Garmin 9060

Anchors - type/number used: 3 rebar, 1 anchor

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☐ Calm; ☑ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☑ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 1022 / 2255 | **Height of most recent LOW tide (feet):** 3.0 / -0.8

Precipitation: ☑ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☑	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☑	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☑ Ulva; ☐ Other

Natural streams/rivers present: ☑ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☐ Yes ?

Other habitat comments/observations:

boulders, barnacles, wavy

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☑ Commercial; ☐ Industrial; ☑ Major road/highway; ☑ Park; ☑ Public access;
☐ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☑ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: rip rap

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☑ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☑ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☑ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☑ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☑ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Treatment Plant Condition: ? don't see it

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

treatment plant some creosote logs
runoff - road
Ships

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

Just N of beach near plant

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: Myrtle Edwards	Site Name: Myrtle Edwards		
Bag numbers:	741	746	743	752
Retriever name(s): Connie Sullivan, Paul Friedrickson, Michelle Piñon			
Recorder name: Connie Sullivan			
Retrieval date: 2/9/2016	Time cage removed: 23:15		
Cage GPS location (decimal degrees)	Latitude: 47.618551	Longitude: -122.361002	Accuracy (± XX feet): +/- 5m
GPS make/model or app name: (must be set to datum NAD83) Handy GPS Free			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

Stronger sewage smell

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):

2 tags fell off
Tag 743 and one of the unknown grew together / all three stuck together

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DEPLOYMENT INFORMATION

Site ID: HC_FP ~~SPONSORED~~	Site Name: Fisherman's Point		
Bag numbers:	710 (several dead)	709	592	587
Deployer name(s): Hans Daubenberger			
Recorder name: Katy Davis			
Deployment date: 10 26 2015	Time cage anchored: 2308		
Cage GPS location (decimal degrees)	Latitude: 47.78221	Longitude: -122.83443	Accuracy (± XX feet): 20 ft
GPS make/model or app name: (must be set to datum NAD83)	GARMIN 72H		
Anchors - type/number used:	1 Helical, 2 rebar		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 2256 **Height of most recent LOW tide (feet):** -0.7

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☒	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☒ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☒ Yes

Other habitat comments/observations: Eelgrass bed ~1m below cage site
2 starfish observed

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☒ Park; ☒ Public access;
☒ Rural residential; ☒ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☒ None;

☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☒ Other: Natural, wooded, public shellfish beach

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: undetermined (i.e. mouth diameter);
Type: freshwater seep Condition: 100m east of cage site; from ravine

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
None

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
Healthy, high density population of pacific oysters.

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: Sponsored	Site Name: Fisherman's Point		
Bag numbers:	710	709	592	587
Retriever name(s): Hans Daubenberger			
Recorder name: Katy Davis			
Retrieval date: 2-8-2016	Time cage removed: 20:56		
Cage GPS location (decimal degrees)	Latitude: 47.78221	Longitude: -122.83433	Accuracy (± XX feet): ± 20ft
GPS make/model or app name: (must be set to datum NAD83) GARMIN 72H			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
NO

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): N/A

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DEPLOYMENT INFORMATION

Site ID: HC_HO	Site Name: Holly – Hood Canal		
Bag numbers:	931 (1 dead)	918 (1 dead)	919	932
Deployer name(s): Mauro Heine, Renee Scherdnik			
Recorder name:			
Deployment date: 10/27/15	Time cage anchored:		
Cage GPS location (decimal degrees)	Latitude: 47.570449763 ~~47° 34.227045~~	Longitude: -122.971557263 ~~122° 58.29272~~	Accuracy (± XX feet): ~~2.09 ft~~ 1.2 FT
GPS make/model or app name: (must be set to datum NAD83)	Trimble Geo XM (2005 series)		
Anchors - type/number used:	2 rebar, 1 helical anchor, 1 rock		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☑ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: | **Height of most recent LOW tide (feet):**

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☑ No; ☐ Yes; Natural spring/freshwater seep: ☑ No; ☐ Yes

Other habitat comments/observations:

oysters, 2 sea stars nearby

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☒ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☐ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☒ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☒ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☒ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☐ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name: Hood Canal – Holly		
Bag numbers:	937 (3)	918 (1)	919 (2)	932
Retriever name(s): M. Heine, R. Scherdnik				
Recorder name: M. Heine				
Retrieval date: 2/8/16		Time cage removed: 9:20pm		
Cage GPS location (decimal degrees)	Latitude:	Longitude:	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)				

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

NO

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):

- cage in good condition
- small red eggs in cage

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DEPLOYMENT INFORMATION

Bellingham Bay

te ID: NPS BLSC	Site Name: Little Squalicum Creek		
Bag numbers:	916	935	929	927
Deployer name(s): Mike Poelskin, Lyle Skoar			
Recorder name: MIKE PARELSKIN			
Deployment date: 10/27/15	Time cage anchored: 10:25 PM		
Cage GPS location (decimal degrees)	Latitude: 48.7639°N	Longitude: 122.5175°W	Accuracy (± XX feet): 9 feet
GPS make/model or app name: Garmin GPSmap 62s (must be set to datum NAD83)			
Anchors - type/number used: 2 HELICAL + 3 REBAR			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 11:15 AM **Height of most recent LOW tide (feet):** 3.5 Ft.

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☐ No; ☒ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:

Floating / dead eelgrass

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☒ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☒ None;

☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☐ No; ☒ Yes, type/makeup: ABANDONED PIER

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☒ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☒ Creosote ☒ Other treated wood; ☒ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☒ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
Next to long derelict dock (20m away)

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: LITTLE SQUALICUM CREEK		Site Name: LITTLE SQUALICUM CREEK		
Bag numbers:	927	929	935	916

Retriever name(s): LYLE SKAAR JULIE LEWIS SARAH BROOKE BENJAMIN MARKER MATTHEW HOWELL ANDREW MARKER

Recorder name: LYLE SKAAR

Retrieval date: 2/8/16 Time cage removed: 9:11 P.M.

Cage GPS location (decimal degrees)	Latitude: 48.7639° N	Longitude: 122.5175° W	Accuracy (± XX feet): 9 FT.

GPS make/model or app name:
(must be set to datum NAD83) GARMIN GPS MAP 62S

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
N/A

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):
MUSSEL NUMBERS CAME OFF IN THE TIDE. THEY STAYED IN THE CAGE AND WERE MATCHED TO THE PIECE REMAINING WITH THE BAG. SARAH BROOKE BENJAMIN HAS PHOTOS

NB

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DEPLOYMENT INFORMATION Cherry Point Ag. Reserve 4 Conoco Phillips

Site ID: NPS CPAR4	Site Name: Cherry Point South		
Bag numbers:	940	908	905	906
Deployer name(s): Michael Kyte			
Recorder name:			
Deployment date: 10/27/2015	Time cage anchored: 10:35 pm		
Cage GPS location (decimal degrees)	Latitude: N 48.82078	Longitude: W 122.71008	Accuracy (± XX feet): ± 3.00m ~~[.008]~~
GPS make/model or app name: (must be set to datum NAD83)	Garmin montana - NAD83.		
Anchors - type/number used:	3-Re-Rod.		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☒ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 12:01 AM 12/08/15 **Height of most recent LOW tide (feet):** -1.09' -0.416

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☒	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae: 0%

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☒ Yes

Other habitat comments/observations: Ground water!
Cage placed among large boulders for protection

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☒ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☒ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☒ None;

☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

NB

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: PORT within 200+m.

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: ~12" (i.e. mouth diameter);
Type: stormwater Condition: Good. on bluff above beach.

Outfall (pipe, culvert, point of flow onto beach): Size: (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

None

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

Cage is located approximately midway, ≤ 1/4 mi., between residential shoreline & Phillips 66 Refinery marine terminal.

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name: Neptune Beach/Henry Point South		
Bag numbers:	908	940	906	905
Retriever name(s): N. Seyster, H. Young, M. Harris, M. Kyte				
Recorder name: N. Seyster				
Retrieval date: 2/8/16		Time cage removed: 10:42 pm		
Cage GPS location (decimal degrees)	Latitude: N 48.82078	Longitude: W 122.71008	Accuracy (± XX feet):	
GPS make/model or app name: Garmin montana (must be set to datum NAD83)				

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

no

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): Small hole damage on top of the cage but no signs of predation. Substantial eel grass coverage

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Mussel Monitoring Site Datasheet

NPS DHCC

DEPLOYMENT INFORMATION

e ID: MRC Site (Whatcom Co)	Site Name: Drayton Harbor, California Creek		
Bag numbers:	939	933	934	922
Deployer name(s): April Markiewicz, Eli Markiewicz, Meagan Harris			
Recorder name: April Markiewicz			
Deployment date: 10/27/2015	Time cage anchored: 10:40 pm		
Cage GPS location (decimal degrees)	Latitude: 48° 57.725'	Longitude: 122° 43.962'	Accuracy (± XX feet): ± 16 ft
GPS make/model or app name: (must be set to datum NAD83)	Garmin GPS map 60 CSx		
Anchors - type/number used:	Chain to secure cage to middle piling on north side plus 3 rebar through cage		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☑ Flat; ☑ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☑ Sheltered

Time of most recent LOW tide: 10:45 pm **Height of most recent LOW tide (feet):** 0.0 ft

Precipitation: ☑ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☑	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☑	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☑ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☐ No; ☑ Yes; Natural spring/freshwater seep: ☐ No; ☐ Yes

Other habitat comments/observations: California Creek flows under bridge. Cage under bridge, pilings, rip rap.

Native mussels on pilings, clam on substrate, crab (live), oysters

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☑ Major road/highway; ☐ Park; ☑ Public access;
☑ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☑ Hard (bulkhead, riprap, etc.) - 90 % shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☑ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☑ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☑ Outfall; ☑ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☑ Concrete; ☐ Steel; ☐ Other:

Tires present: ☑ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: 2 1/2 ft (i.e. mouth diameter);
Type: Concrete Condition: No cracks

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: ~~Concrete~~ Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
Runoff from bridge surface into water below.

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
Odor - petroleum & rotting vegetation smell at outfall. Location: N 48° 57.736', W 122° 43.939'

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: MRC Site (Whatcom Co.)	Site Name: Drayton Harbor			
Bag numbers:	922	933	939	934
Retriever name(s): Eli Mackiewicz, April Markiewicz, Katherine Sell				
Recorder name: April Markiewicz				
Retrieval date: 02/08/2016		Time cage removed:		
Cage GPS location (decimal degrees)	Latitude: 48.96218°N	Longitude: 122.73286	Accuracy (± XX feet): 16'	
GPS make/model or app name: (must be set to datum NAD83)				
ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)? No				
Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): No major changes. Native mussels on pilings above cage. California Creek water is brownish & murky				

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Mussel Monitoring Site Datasheet

DEPLOYMENT INFORMATION

te ID: NPS_FBAR	Site Name: Fidalgo Bay - Weaverling spit		
Bag numbers:	872	862	860	861
Deployer name(s): Melissa Sanchez, Gaius Horton, Pete Haause			
Recorder name: Melissa Sanchez			
Deployment date: October 29, 2015	Time cage anchored: 10:55 PM		
Cage GPS location (decimal degrees)	Latitude: 48.48273	Longitude: 122.58545	Accuracy (± XX feet):
GPS make/model or app name: (must be set to datum NAD83)	GARMIN GPSmap 62s		
Anchors - type/number used:	screw anchor & zip ties		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: | **Height of most recent LOW tide (feet):**

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:

- Refinery across bay
- Trestle

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☒ Public access;
☐ Rural residential; ☒ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☒ None;

☒ Hard (bulkhead, riprap, etc.) - 10 % shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☐ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: NPS _ FBAR		Site Name: Fidalgo Bay		
Bag numbers:	872	862	860	861
Retriever name(s): MS, GH, DS, PH, Wayne				
Recorder name: Melissa Sanchez				
Retrieval date: 9 Feb 2016		Time cage removed: 9:18 PM		
Cage GPS location (decimal degrees)	Latitude:	Longitude:	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)				

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
NO

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):
- hermit crabs inside mussel bag
- mussels from different bags attached to each other

CAGE LOST

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Site ID: SJI-OINS	Site Name: North Shore, Orcas Island		
Bag numbers: 579, ~~[illegible]~~ 569	577	572	
Deployer name(s): Barbara Bentley, Marta Branch, Cheryl Kumer			
Recorder name: Barbara Bentley			
Deployment date: 10-26-15	Time cage anchored:		
Cage GPS location (decimal degrees)	Latitude: 122° 55' 45.31 W	Longitude: 48° 42' 39.37" N	Accuracy (± XX feet):
GPS make/model or app name: (must be set to datum NAD83)	Google Earth		
Anchors - type/number used:	1 screw anchor 3 rebars		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 11:40 **Height of most recent LOW tide (feet):**

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☐ Yes

Other habitat comments/observations:

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☒ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☒ None;

☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☒ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: SJI-OINS	Site Name: North Shore, Orcas Island		
Bag numbers:			
Retriever name(s):			
Recorder name: Jennifer Lankesbury			
Retrieval date:	Time cage removed:		
Cage GPS location (decimal degrees)	Latitude:	Longitude:	Accuracy (± XX feet):
GPS make/model or app name: (must be set to datum NAD83)			
ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?			

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):
Cage found washed up on beach in the area on 11/26/2016 by Jay Davis (USFWS)!

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DEPLOYMENT INFORMATION

Site ID: ~~Sponsor~~ RJP SPS_HIAP	Site Name: Hammersley Inlet - Arcadia point		
Bag numbers:	673	668	649	666
Deployer name(s): Erin Medlock, Kira Peck, Michael Brown			
Recorder name: Erin Medlock			
Deployment date: 10/26/15	Time cage anchored: ~~11:00~~ 11:00 pm		
Cage GPS location (decimal degrees)	Latitude: 47.198962	Longitude: -122.939524	Accuracy (± XX feet):
GPS make/model or app name: (must be set to datum NAD83)	Map coordinates - app - Kira Pecks phone (Samsung Stratosphere)		
Anchors - type/number used:	1 screw anchor, 3 L rebar		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: | **Height of most recent LOW tide (feet):**

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☒	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☐ Rural residential; ☐ Undeveloped; ☒ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 90 % shoreline armored; Materials used: Concrete / No creosote

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☒ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☒ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
Time cage anchored: Anchoring was finished at 11:15; cage was placed at waterline at 11:00pm. There was confusion on which time you wanted to be recorded here.

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name:		
Bag numbers:	649	666	668	673
Retriever name(s):	Evin Medlock, Brandon Osterlund			
Recorder name:	Evin Medlock			
Retrieval date:	2/9/2016	Time cage removed:	~~11:40am~~ 11:25pm	
Cage GPS location (decimal degrees)	Latitude: 47.19905	Longitude: 122.93958	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)	Garmin Oregon 550 · WCC #1			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)? NO

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): Photo 864 on GPS 1, Photo 865-faraway veiw

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DEPLOYMENT INFORMATION Nisqually Reach Ag. Reserve				
te ID: SPS-NRQR	Site Name: Sandy Bay, Anderson Island			
Bag numbers:	948	949	977	976
Deployer name(s): BB, JL, MPO, BAM, GH				
Recorder name: MPO				
Deployment date: 10/28/15		Time cage anchored: 11:40pm		
Cage GPS location (decimal degrees)	Latitude: 47.14956	Longitude: 122.67643	Accuracy (± XX feet):	
GPS make/model or app name: R022210 GARMIN GPSmap 62s (must be set to datum NAD83)				
Anchors - type/number used: Screw anchor, 3 rebar pieces				

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☐ Calm; ☒ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☒ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 1253 **Height of most recent LOW tide (feet):** 4.5'

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☒	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☒	1 - 20% ☒	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☒ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☒ Yes

Other habitat comments/observations:

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☒ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 30 % shoreline armored; Materials used: _____

☒ Soft (plantings, large woody debris, etc.) - 70 % shoreline armored (↑ creosote in armoring?)

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☒ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☒ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☒ Other: Residential

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other: NONE

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☐ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
MUSSEL BAG 949: One mussel NOT Living from Start (empty Shell)

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name: Sandy Bay, Anderson Island		
Bag numbers:	976	977	948	949
Retriever name(s): MS, JL, GH, DS				
Recorder name: Melissa Sanchez				
Retrieval date: Feb 7th, 2016		Time cage removed: 9:43 PM		
Cage GPS location (decimal degrees)	Latitude: 47.14956	Longitude: 122.67645	Accuracy (± XX feet): ±15 ft.	
GPS make/model or app name: (must be set to datum NAD83)	GPS map 62S - Garmin			
ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?	NO			
Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):	young kelp and shore crabs found inside mussel bags			

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DEPLOYMENT INFORMATION

SPS-PBL Purdy

te ID: SPONSORED	Site Name: BURLEY LAGOON			
Bag numbers:	644	639	634	637
Deployer name(s):	Dorothy Walker, KATHIE STORK, STEVE CASEBOLT, HEATHER McFARLANE			
Recorder name:	KATHIE STORK			
Deployment date:	October 26, 2015	Time cage anchored:	10:50 PM	
Cage GPS location (decimal degrees)	Latitude: 47.3868 N	Longitude: -122.6667 W	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)	CELL PHONE Sygic APP.			
Anchors - type/number used:	Helical + 3 REBAR			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☒ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☐ Moderately exposed; ☒ Sheltered (fairly)

Time of most recent LOW tide: 11:06 AM / NEXT 11:38 PM **Height of most recent LOW tide (feet):** 2'11" / NEXT -0'9"

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☐	Sand-mud mix (clay) ☒	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☐	20 - 40% ☒	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☒ Other seaweed

Natural streams/rivers present: ☐ No; ☐ Yes; Natural spring/freshwater seep: ☐ No; ☒ Yes

Other habitat comments/observations:

JUST BELOW OYSTERS ON BEACH GROWN BY OWNERS FOR THEIR OWN CONSUMPTION.

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☒ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 80 % shoreline armored; Materials used: Timber, concrete

☒ Soft (plantings, large woody debris, etc.) - 20 % shoreline armored (↑ creosote in armoring?) timber

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☒ Other: Personal

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☒ Creosote ☐ Other treated wood; ☒ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: 4" (i.e. mouth diameter);
Type: spring water/ Condition: CLEAR

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: — Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

—

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

South of boat slip 10' down tide from — / residentual and adjacent to aquaculture operation

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION

(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name: Burley Lagoon		
Bag numbers:	644	637	639	634
Retriever name(s):				
Recorder name:				
Retrieval date: Feb. 10, 2016		Time cage removed:		
Cage GPS location (decimal degrees)	Latitude:	Longitude:	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)				
ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?				
Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):				

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DEPLOYMENT INFORMATION

Site ID: WB CB	Site Name: Cavalero County Park		
Bag numbers:	574	575	582	580
Deployer name(s): John Mathis, Gary Skorheim,			
Recorder name: F. Perez			
Deployment date: 10-26-15	Time cage anchored: 10 pm		
Cage GPS location (decimal degrees)	Latitude: N48.17442°	Longitude: W 122.47582	Accuracy (± XX feet):
GPS make/model or app name: (must be set to datum NAD83)	Garmin Etrex (office#2 UTM WGS 1984		
Anchors - type/number used:	1 helical, 3 rebar		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☐ Calm; ☒ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 1052p **Height of most recent LOW tide (feet):** -0.9

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☒ with sand	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☒ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:
loose eelgrass floating

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☒ Public access;
☒ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☒ Hard (bulkhead, riprap, etc.) - 100 % shoreline armored; Materials used: wood

☐ Soft (plantings, large woody debris, etc.) - _____ % shoreline armored (↑ creosote in armoring?) Y

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

Cavalero p2

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Current shoreline use (check all that apply): ☒ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: park beach

Dock/pier/wharf material: ☒ Creosote ☐ Other treated wood; ☒ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.): none visible

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
Cage placed to the south of the ramp, near southern park boundary

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID: WB CB		Site Name: Cavalero Beach, Camano Island		
Bag numbers:	574	575	582	580
Retriever name(s): Franchesca Perez, Gary Skorheim				
Recorder name: Franchesca Perez				
Retrieval date: 2-5-2016		Time cage removed: 845 pm		
Cage GPS location (decimal degrees)	Latitude: N48.17442	Longitude: W122.47582	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83) Garmin Etrex UTM WGS 1984				

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
no

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): cage fine. habitat same.

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DEPLOYMENT INFORMATION

Site ID: WB-KP	Site Name: Kayak Pt Park			
Bag numbers:	692	684	690	680
Deployer name(s): Jennifer Sevigny, Amanda Summers, Raylene Levi				
Recorder name: Amanda Summers				
Deployment date: 10/26/2015		Time cage anchored: 10:10 p.m		
Cage GPS location (decimal degrees)	Latitude: 48.13389°N	Longitude: 122.36600°W	Accuracy (± XX feet): ±42 feet	
GPS make/model or app name: (must be set to datum NAD83) Etrex #1				
Anchors - type/number used: Helical Anchor + 3 rebar				

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☑ Flat; ☐ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☑ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 10:52 **Height of most recent LOW tide (feet):** -0.9

Precipitation: ☑ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☑	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☑	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☑ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☑ No; ☐ Yes; Natural spring/freshwater seep: ☑ No; ☐ Yes

Other habitat comments/observations:

Sand + cobble beach w/ a few large Boulders

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☑ Park; ☐ Public access;
☐ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☑ None;

☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☐ Soft (plantings, large woody debris, etc.) - _____% shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☑ No; ☐ Yes, type/makeup:

Kayak p2

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☐ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☑ Other: Park Beach

Dock/pier/wharf material: ☑ Creosote ☐ Other treated wood; ☑ Concrete; ☐ Steel; ☐ Other: Around the corner of beach

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☑ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Homes / Park Bathroom / Group Shelter picnic area

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

mid-way down the undeveloped section of Beach
2 large boulders above tide line.

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name: Kayak Pt. Park		
Bag numbers:	692	684	690	680
Retriever name(s):	Maggie Taylor	Amanda Summers		
Recorder name:	Maggie Taylor			
Retrieval date:	2/5/2016		Time cage removed:	826 pm
Cage GPS location (decimal degrees)	Latitude: Same	Longitude:	Accuracy (± XX feet):	

GPS make/model or app name:
(must be set to datum NAD83)

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

No

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):

Good condition

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DEPLOYMENT INFORMATION

te ID: WPS-1C	Site Name: Illahee Creek		
Bag numbers:	603	614 (1 dead)	623	632
Deployer name(s): Mauro Heire, Jim Aho			
Recorder name: Jim Aho + Mauro Heire			
Deployment date: 10/26/15	Time cage anchored: 10:05		
Cage GPS location (decimal degrees)	Latitude: 47.615868493	Longitude: -122.594947132	Accuracy (± XX feet): 0.9 FT
GPS make/model or app name: (must be set to datum NAD83)	Trimble Geo XH (2005 series)		
Anchors - type/number used:	1 heliomotor + 2 rebar		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☑ Flat; ☑ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☑ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 10:30 AM **Height of most recent LOW tide (feet):** ~3.1 FT

Precipitation: ☑ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

edrock, hardpan ☐	Cobble-gravel mix ☑	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☑	1 - 20% ☐	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☑ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☐ Ulva; ☐ Other

Natural streams/rivers present: ☑ No; ☐ Yes; Natural spring/freshwater seep: ☑ No; ☐ Yes

Other habitat comments/observations:

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☑ Public access;
☐ Rural residential; ☐ Undeveloped; ☑ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☑ Hard (bulkhead, riprap, etc.) - 70 % shoreline armored; Materials used: CONCRETE

☐ Soft (plantings, large woody debris, etc.) - 30 % shoreline armored (↑ creosote in armoring?)

bandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☑ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☐ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☑ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☑ Other: WATERFRONT HOMES

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☑ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name: Illahee		
Bag numbers:	632 (3)	603 (3)	614 (1)	623 (2)
Retriever name(s):	M. Heine, J. Aho		(observed mort. in parenthesis)	
Recorder name:	Mayo Heine			
Retrieval date: 2/7/16		Time cage removed: 8:40 pm		
Cage GPS location (decimal degrees)	Latitude:	Longitude:	Accuracy (± XX feet):	

GPS make/model or app name:
(must be set to datum NAD83)

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?

None seen

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):

Everything was as we had left it.

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DEPLOYMENT INFORMATION

Site ID: ~~Sponsored~~ WPS_PB	Site Name: Point Bolin		
Bag numbers:	641	655	642	656
Deployer name(s): Brandon Osterlund, Alana Gaffen, Michelle Leonard			
Recorder name: Michelle Leonard			
Deployment date: 10/26/15	Time cage anchored: 10:12 pm		
Cage GPS location (decimal degrees)	Latitude: 47.69434	Longitude: 122.59589	Accuracy (± XX feet):
GPS make/model or app name: (must be set to datum NAD83) Garmin, Oregon 650			
Anchors - type/number used: (1) Red Bar Anchor (3) Metal Rods			

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☐ Exposed; ☒ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: **Height of most recent LOW tide (feet)**:

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☐	Sand ☐	Sand-mud mix ☒	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☐	20 - 40% ☐	40 - 60% ☒	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☒ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:

N/A

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☐ Commercial; ☐ Industrial; ☐ Major road/highway; ☐ Park; ☐ Public access;
☒ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☐ Hard (bulkhead, riprap, etc.) - _____% shoreline armored; Materials used: _____

☒ Soft (plantings, large woody debris, etc.) - 100 planted% shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☒ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☒ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☐ Marina; ☒ Mooring buoy; ☐ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☒ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):
N/A

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):
Bag #'s with dead mussels on arrival:
"641" = 1 dead / Cage placed 30ft North of large boulder.

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name: Point Bolin		
Bag numbers:	641	655	642	656
Retriever name(s):	Brandon Osterlund	Mike Brann		
Recorder name:	Brandon Osterlund			
Retrieval date:	2/8/16	Time cage removed:	9:40 PM	
Cage GPS location (decimal degrees)	Latitude: 47.69436	Longitude: 122.54589	Accuracy (± XX feet):	
GPS make/model or app name: (must be set to datum NAD83)	Oregon 550 Garmin WCC #2			

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
No

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage): mussel from 641 on 655 tag,
photo #7166 on WCC Garmin #2

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DEPLOYMENT INFORMATION

Site ID: WPS_SVD	Site Name: Silverdale, Dyes Inlet		
Bag numbers:	852 (2 dead)	842	853 (1 dead) 848 (1 dead)
Deployer name(s): Mauro Heine, Chuck Smiley			
Recorder name: Mauro Heine			
Deployment date: 10/26/15	Time cage anchored: 1045		
Cage GPS location (decimal degrees)	Latitude: 47.642888030	Longitude: -122.696679841	Accuracy (± XX feet): 1.4 FT
GPS make/model or app name: (must be set to datum NAD83)	Trimble Geo XH (2005 series)		
Anchors - type/number used:	heli anchor & 2 rebar		

WATER & WEATHER CONDITIONS (at cage)

Sea conditions: Wave energy: ☐ Flat; ☒ Calm; ☐ Wind chop; ☐ Swells; ☐ Breaking waves

Beach exposure level: ☒ Exposed; ☐ Moderately exposed; ☐ Sheltered

Time of most recent LOW tide: 11:15 AM **Height of most recent LOW tide (feet):** ~2.9 FT

Precipitation: ☒ None; ☐ Steady rain; ☐ Showers; ☐ Snow; ☐ Hail

HABITAT (within 200 foot radius of cage)

Substrate type – select ONE category that describes the majority (at least 50%) of substrate around cage:

Bedrock, hardpan ☐	Cobble-gravel mix ☐	Sand-gravel mix ☒	Sand ☐	Sand-mud mix ☐	Mud, silt ☐

Aquatic vegetation coverage – percent substrate around cage covered by seagrasses and/or algae:

None (<1%) ☐	1 - 20% ☒	20 - 40% ☐	40 - 60% ☐	60 - 80% ☐	80 - 100% ☐

Type of aquatic vegetation present: ☐ None; ☐ Eelgrass; ☐ Kelps; ☐ Fucus; ☒ Ulva; ☐ Other

Natural streams/rivers present: ☒ No; ☐ Yes; Natural spring/freshwater seep: ☒ No; ☐ Yes

Other habitat comments/observations:

ANTHROPOGENIC STRUCTURES ALONG SHORELINE
visible from cage up to 400 m (1300 feet, ¼ mile) along either side of beach

Adjacent upland use (check all that apply):

☐ Agricultural; ☑ Commercial; ☐ Industrial; ☐ Major road/highway; ☑ Park; ☑ Public access;
☐ Rural residential; ☐ Undeveloped; ☐ Urban residential; ☐ Other _____

Erosion control structures (i.e. armoring of shoreline): ☐ None;

☑ Hard (bulkhead, riprap, etc.) - 90 % shoreline armored; Materials used: Concrete

☑ Soft (plantings, large woody debris, etc.) - 10 % shoreline armored (↑ creosote in armoring?)

Abandoned or derelict structures (includes old pilings, docks, half-sunken boats, metal pieces, etc.)

☐ No; ☐ Yes, type/makeup:

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Current shoreline use (check all that apply): ☒ Boat ramp/launch; ☐ Boathouse/shed; ☐ Bridge; ☐ Breakwater; ☐ Dock/pier/wharf; ☐ Floating home; ☒ Marina; ☐ Mooring buoy; ☒ Outfall; ☐ Piling/dolphin; ☐ Raft/float; ☐ Road; ☐ Shipyard or terminal; ☐ Utilities; ☐ Other: _____

Dock/pier/wharf material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Piling/dolphin material: ☐ Creosote ☐ Other treated wood; ☐ Concrete; ☐ Steel; ☐ Other:

Tires present: ☐ No; ☐ Yes - Estimated Number: Used for:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Outfall (pipe, culvert, point of flow onto beach): Size: _____ (i.e. mouth diameter);
Type: Condition:

Other obvious sources of pollution (oil slicks, seeps, etc.):

Additional comments/observations (it's a good idea to note landmarks that will help you find the cage later!):

TAKE PHOTOS of the deployed cage and surrounding substrate, including any interesting observations!

RETRIEVAL INFORMATION
(TAKE PHOTO of the mussel cage BEFORE removal, to document condition of cage.)

Site ID:		Site Name: Silverdale		
Bag numbers:	842	848	853	852 (1) obs. dead
Retriever name(s):	M. Heine, C. Smiley			
Recorder name:	Mauro Heine			
Retrieval date: 2/7/16		Time cage removed: 9:20 pm		
Cage GPS location (decimal degrees)	Latitude:	Longitude:	Accuracy (± XX feet):	

GPS make/model or app name:
(must be set to datum NAD83)

ANY NEW obvious sources of pollution (oil slicks, seeps, etc.)?
Nothing seen

Additional comments/observations (including condition of CAGE on retrieval, major changes in habitat or structures around cage):
One top edge of cage bashed in a bit, but still sealed pretty well.