US Army Corps of Engineers®
Seattle District

Notice of Preparation

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Public Notice Date: 5 June 2020
Expiration Date: 25 June 2020
Reference: CENWS-PMP-20-02
Name: Hiram M. Chittenden Locks (Locks) Urgent Interim Scour Repair

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Interested parties are hereby notified that the U.S. Army Corps of Engineers, Seattle District (Corps) plans to prepare, pursuant to the National Environmental Policy Act (NEPA), an environmental assessment (EA) for proposed urgent interim repairs to the Hiram M. Chittenden Locks (Locks) stilling basin apron, spillway ogee, and the fish ladder, located in the Lake Washington Ship Canal (LWSC) in the City of Seattle, King County, Washington (Figures 1 and 2). The repairs are intended to address scour and erosion damage caused by a historic spill event in early February 2020 after numerous winter rain events required fully opening all spillway gates at the Locks. The purpose of this Notice of Preparation (NOP) is to solicit comments from interested persons, groups, and agencies on the Corps' proposed action under NEPA.

AUTHORITY

The Federal project was authorized for construction by the Rivers and Harbors Act (RHA) of 1910 in accordance with House Document No 953 of the 60th Congress, first session for the purpose of facilitating commercial navigation between Puget Sound and Lake Washington. This included construction of a dam, two Locks, and the necessary accessory works at the entrance to Salmon Bay, including a fish ladder. Construction by the Corps occurred between 1911 and 1916. Construction was contingent upon King County or other local agency excavating the upstream navigation channel from the Locks to Lake Washington to a depth of 25 feet and 75 feet wide. The State of Washington and King County cost-shared the upstream excavation and construction with the Federal government. The RHA modified the existing alignment of the canal and established the reservoir regulation parameters (one foot above and one foot below the existing elevation of Lake Union).

PROJECT LOCATION AND DESCRIPTION

The Corps operates and maintains the LWSC project, an eight-mile long navigation channel located within the City of Seattle that extends from deep water in Puget Sound through Shilshole Bay, the Locks, Salmon Bay, Lake Union, Portage Bay and Union Bay to deep water in Lake Washington. The LWSC project includes the Hiram M. Chittenden Locks (Locks), a navigation channel (often referred to as the LWSC or ship canal), and a reservoir which includes two natural lakes, Lake Washington and Lake

Union. The operation of the locks allows commercial navigation and connectivity of the saltwater of Puget Sound to the freshwater of Lakes Union and Washington.

The Locks are located south of the Ballard neighborhood in Seattle, Washington, approximately one mile southeast of Shilshole Bay. While not an explicit authorized project purpose, the Locks also allow the passage of recreational vessels and anadromous fish species. In addition to the missions of navigation and environmental stewardship, the Locks and LWSC are also authorized for recreation, receiving approximately one million pedestrian visitors each year. The reservoir is regulated for navigation and fish passage.

The project area encompasses the fish ladder and area immediately downstream and adjacent to the fish ladder shown in Figure 2.

NEED

Concrete erosion near the fish ladder was first observed in a 2019 survey. In early February 2020, a historic spill event due to numerous winter rain events occurred at the Locks that required fully opening all spillway gates. Afterwards, a diver inspected the area near the fish ladder, and a bathymetry inspection was completed in February 2020. Analysis of these inspections revealed there was significant erosion of concrete fill between the stilling basin apron and a driven steel sheet pile wall of the fish ladder, on the downstream side of the spillway (Figures 3 and 4). The concrete lost to erosion between the spillway apron and sheet pile wall is approximately 20 feet long, about 5 feet wide, and 4 feet deep. This damage exposed native foundation material (i.e., a hard, clay-like silt layer referred to as Lawton clay) that the spillway and fish ladder were built upon (Figures 4-6). Other damage includes holes of varying diameter and length in the spillway monolith ogee surface (Figure 7; the downstream face of the spillway), spillway apron, and an unknown amount of scour between the fish ladder entrances and behind the fish ladder sheet pile wall (Figure 8). Three broken pieces of concrete from the scour hole between the stilling basin apron and fish ladder were deposited on the apron after the February 2020 spill event (Figure 9).

The erosion damage is serious and threatens the stability of the fish ladder and spillway structures if left unrepaired. Erosion damage accelerates when foundation material is exposed. If left unrepaired, additional spill events would continue to expand the area of erosion and cause more damage, potentially leading to stilling basin apron failure and undermining of the toe of the spillway monoliths at the fish ladder. Loss of spillway or fish ladder operations would have far-reaching economic and environmental consequences to the Lake Washington basin due to the inability to maintain authorized lake levels and/or provide fish passage for Endangered Species Act-listed salmonids.

The Corps recommends urgent interim repair of the damage as soon as practical and no later than the onset of flood season in October 2020, to prevent possible failure of the stilling basin apron and fish ladder. A permanent repair is being assessed but the analysis to determine the cause of the erosion and analysis of proposed engineered

designs for a permanent repair cannot be accomplished before the onset of the flood season in October 2020. Hydraulic and structural modeling, with a detailed inspection of the entire stilling basin to detect any additional erosion damage, is needed to design a permanent repair that is resistant to wear and erosion under required spill conditions. The interim repair is needed to provide time (i.e., at least one year) for design, funding, and the in-water work schedule.

PURPOSE

The purpose of the proposed project is to maintain the functional integrity of the authorized structures by performing an urgent interim scour repair and removal of damaged and eroded concrete in several locations on the spillway, in the stilling basin, and behind the fish ladder sheet pile wall. The proposed project would prevent further scouring during flood season in October 2020.

ACTIONS ADDRESSED UNDER NEPA

For the proposed urgent interim repair in 2020, three alternatives are being considered as follows:

- **Alternative 1 – No Action**

  No interim repair to the areas of erosion or undermining would be performed. Interim spill operations to try to avoid further erosion such as avoiding use of Spill Bay 6 altogether or changing the spill pattern (i.e., the order in which the spill bays are opened and to what degree) would likely be implemented. If no repair is performed and spill is necessary from all six spill bays, then the areas of erosion would likely grow. The stilling basin apron slab could fail and the toe of the spillway monoliths could be undermined, causing severe structural damage and rendering the spillway and fish ladder inoperable. This alternative does not restore the function of the stilling basin apron or spillway ogee, or protect the fish ladder; therefore, this is not an acceptable alternative.

- **Alternative 2 – Hydraulic Concrete**

  The Corps would place hydraulic concrete (i.e., a type of concrete that can harden quickly while in contact with water) underwater into all scoured areas in grout bags or forms, pumped into fish ladder wall voids, and/or placed by hand with divers. Grout bags are semi-permeable cloth bags and are typically placed into a scoured area so concrete can be pumped into the bag from the surface or by divers. Forms act like a “lid” to the scoured areas with concrete pumped underneath. This method of concrete placement uses a tremie pipe (i.e., a long section of pipe continuously filled with concrete) to fill the scour area from the bottom to the top to displace water from the scoured area for a strong and even repair. Hydraulic concrete placement is a common method of scour repair at dams and bridges.

- **Alternative 3 – Riprap and Concrete**

  This alternative uses riprap on the scoured areas to prevent further erosion between the stilling basin apron and the fish ladder sheet pile. Guidance on riprap size recommends riprap approximately 10 feet in diameter to provide enough weight to withstand water velocities from the spillway. Small riprap or other rock material would need to be placed in the scoured hole first, then covered with a screen to hold the materials in place and covered with either a 10-foot diameter riprap or similarly weighted gabion baskets (i.e., wire baskets filled with rock). A support barge with an excavator and divers would likely assist with repairs. The amount and timing of water released by the spillway would need to be modified to prevent riprap movement. Under Alternative 3, holes on the spillway ogee, apron, and fish ladder voids would still require hydraulic concrete fill. Immediate modification of spill operations as stated in Alternative 1 is needed to avoid further erosion while the interim repairs are in place. To maintain a high level of scour protection, the geometry of the scoured holes, which are a few feet wide, and proximity to the sheet pile that runs alongside the fish ladder, make effective riprap placement difficult.

Both action alternatives would take approximately the same time to complete (15 to 30 days) and would likely occur during the months of September and October 2020, with the intent to work as late in September and into October as possible before the October flood season begins to minimize overlap with adult salmon migration.

PROPOSED ALTERNATIVE

The Corps proposes the Hydraulic Concrete Alternative (Alternative 2) because hydraulic concrete meets the purpose and need while providing the highest level of protection to the Locks structures for at least a year compared to the No Action alternative and avoids work beyond the existing project footprint and structure unlike in Alternative 3 (Riprap and Concrete). The recommended repairs are described further (below), and exact construction methods would be determined by the contractor.

The purpose of the repair under Alternative 2 is to prevent further erosion by filling all scoured areas with hydraulic concrete to prevent further erosion and remove excess concrete pieces (Tables 1 and 2). All repairs would be conducted within the pre-damaged footprints. A concrete batch plant or truck may be stationed on land or on a barge. If concrete can be sourced from a local company, then an on-site concrete batch plant would be unnecessary and concrete would be brought to the repair site by barge or truck. The contractor would prepare a stormwater pollution prevention plan to identify and prevent potential pollution sources, such as from a concrete chute washout area. The consistency of the hydraulic concrete may be thinner or thicker, depending on the concrete components (i.e., sand or larger aggregate; Table 1). The concrete components are chosen based on the geometry of the area to be repaired, repair method (pumped in or placed by hand), and durability.

To create a suitable surface for the hydraulic concrete, material such as loose concrete pieces, vegetation, sand, and shells, would be removed from the scoured areas. If mechanical demolition of existing concrete using tools is necessary to prepare the surface, demolition would be limited to the minimum amount necessary. Excavated materials, including concrete rubble, would be disposed off-site in an appropriate manner. All repairs would occur within the pre-damage footprint.

Table 1. Locations and materials for the urgent interim repair.

Scour Locations	Approximate Volume (cubic yards; cy)	Hydraulic Concrete Component*
Between the stilling basin apron and fish ladder sheet pile wall (Figures 4-6)	5 cy	Aggregate
Spillway monolith ogee and stilling basin apron holes (Figure 7)	1 cy	Aggregate or sand
Spillway apron patches (Figure 7)	1.5 cy	Sand
Erosion behind fish ladder sheet pile wall (Figure 8)	1.5 cy	Sand
Debris	Number and Size	Removal Strategy
Concrete blocks on stilling basin apron (Figure 9)	Three; about 3,000 pounds each	With a barge and crane

*The hydraulic concrete component affects the consistency; aggregate (larger pieces of granular material) make the concrete thicker, while sand makes it a thinner consistency.

Scour holes on the spillway ogee and stilling basin apron would likely be filled with concrete by hand with divers or with forms. The scour hole between the stilling basin apron and the fish ladder would be filled using grout bags or forms and then concrete would be pumped into the bags or forms. Grout bags and forms were selected to place material in an attempt to minimize impact to the salmon by reducing in-water work and minimizing contact between uncured hydraulic concrete and the water. Grout bags and forms do not completely contain the material, but help direct placement and provide some control of the material. It is expected that the grout bags would perform as designed and adapt to the contours of the void to prevent further erosion without requiring cofferdam installation for dewatering or the use of cranes, and allows for work from land. Care would be taken to prevent overfilling of grout bags or forms so that the elevation of new concrete is flush with the surrounding area.

The voids behind the fish ladder sheet pile wall may be filled with hydraulic concrete by core drilling into the void from the top of the wall out of the water. Core drilling would remove a cylinder of concrete from the wall and create holes to tremie concrete into the voids. The holes in the steel sheet pile wall would be sealed prior to filling with hydraulic concrete to create a form; this may involve welding a steel sheet to the fish ladder wall underwater. Divers may assist this portion of the repair and would monitor the sheet pile wall during concrete pumping to ensure the sheet pile wall is not deflecting out from the addition of concrete.

Three pieces of concrete from the scour hole between the stilling basin apron and fish ladder were deposited on the apron after the February 2020 spill event (Figure 8). Sizes of the broken concrete are approximately three feet square and are anticipated to weigh up to 3,000 pounds. A diver and boat or barge with rigging and a crane with the appropriate lifting capacity for retrieval and disposal of concrete would retrieve the pieces, which would be disposed of at an appropriate off-site facility.

A support barge and divers would likely assist with all repair activities. Boats and barges would be moored at an approved location along LWSC property and go to the repair site each day. A previously developed staging area at the north side of the large lock, where Corps boats are stored and maintenance activities take place, would be available to the contractor and would allow for boat loading and unloading of materials and personnel. Staging may also take place along the large lock pier or along West Commodore Way.

Table 2. Summary of Proposed Repair Actions.

Action	Summary
Staging	Utilize existing developed areas at LWSC to stage equipment and materials. West Commodore Way may also be used.
Construction Access	Personnel, equipment, and materials would be transferred from the staging area and loaded on to a barge. The barge would be tethered to shore or LWSC structures. Any dislodged concrete blocks would be removed using a barge-mounted crane. Divers would work from the barge. The pumping of hydraulic concrete would be from a truck stationed on land or from a barge if the pumping can be completed in one day.
Construction Methods	Construction would begin with the removal of any loose materials and dislodged concrete. Repairs to the damaged areas would involve the placement of hydraulic concrete by hand, pumping it from above, and/or with forms and/or grout bags.
Construction Duration	Initial site preparation and staging may begin prior to in-water work. The repair activities would not start until late-September and are to be completed by October 15, 2020. The entire repair operation is expected to last approximately four weeks, including mobilization and post-construction site cleanup.

The fish ladder would remain in operation during the repair unless attraction flow needs to be halted temporarily for the safety of divers, to facilitate the repair (e.g., preventing a form or grout bag from moving during placement due to fish ladder flow or to facilitate equipment movement around the scoured area), or if implemented as a conservation measure for the protection of adult salmon. Alteration to the attraction flow would be coordinated with Federal, State, and Tribal natural resource agencies. After the interim repair, the fish ladder would return to normal operations. Immediate modification of spillway operations is likely to avoid further erosion while the interim repairs are in place.

The Corps has developed a list of conservation measures and incorporated these into the scour repair to reduce environmental impacts of the repair. For this project the best management practices (BMPs) are:

- All concrete fill work would be performed by an experienced and competent underwater concrete specialty contractor with experience in underwater concrete mix design and placement in seawater environments. All concrete mixing and placement shall be performed under the direct supervision of a qualified underwater concrete supervisor or foreman. The contractor would submit the qualifications of the concrete fill contractor and personnel to the Contracting Officer for approval within 15 days after the award of the contract. Concrete fill work may not begin until the contractor has approved the qualifications of the concrete fill contractor.
- Environmentally friendly fuels would be used in machinery stationed on a boat or barge.
- Equipment would be cleaned prior to construction so that it is free of external petroleum-based products while used around the waters of the state. Accumulation of soils or debris would be removed from the drive mechanisms (wheels, tires, tracks, etc.) and the undercarriage of equipment prior to its use.
- The contractor would retrieve any debris generated during construction with a skiff and net. Retrieval would occur at slack tide or when current velocity is low.
- Refueling would not occur in the project area.
- Deploy a turbidity curtain to prevent cement and/or grout fines from moving downstream during scour fill or concrete demolition, as appropriate for the conditions. Flow from the fish ladder may preclude the use of turbidity curtains.
- The contractor would prevent any petroleum products, chemicals, or other toxic or deleterious materials from construction equipment and vehicles from entering the water.
- The contractor would regularly check fuel hoses, oil drums, oil or fuel transfer valves, fittings, etc. for leaks, and would maintain and store materials properly to prevent spills.
- Wash water resulting from wash down of equipment or work areas would be contained for proper disposal, and would not be discharged into state waters unless authorized through a state discharge permit.
- Equipment that enters the surface water would be maintained to prevent any visible sheen from petroleum products appearing on the water.
- There would be no discharge of oil, fuels, or chemicals to surface waters, or onto land where there is a potential for reentry into surface waters.
- No cleaning solvents or chemicals used for tools or equipment cleaning would be discharged to ground or surface waters.
- The contractor would be required to submit a spill prevention control and countermeasures (SPCC) plan prior to the commencement of any construction activities. The SPCC plan would identify and recognize potential spill sources at

the site, outline best management practices, delineate responsive actions in the event of a spill or release, and identify notification and reporting procedures. Implementation of the SPCC plan would minimize the effect of construction activities on the quality of surrounding waters.

- A spill containment kit, including oil-absorbent materials would be kept on-site during construction in the event of a spill or if any oil product is observed in the water. If a spill were to occur, work would be stopped immediately, steps would be taken to contain the material, and appropriate agency notifications would be made.
- Work causing distressed or dying fish, discharges of oil, fuel, or chemicals into state waters or onto land with a potential for entry into state waters, is prohibited. If such work, conditions, or discharges occur, the Applicant shall notify the Washington Department of Ecology (Ecology).

Conservation Measures (implementation of the following conservation measures is dependent on the final work period and on the contractor's evaluation of what are feasible and infeasible actions. Diver safety could dictate a change in fish ladder operations. These must be reviewed by natural resource agency biologists and must be feasible for the contractor to employ):

- Schedule in-water work as late as possible, from late September up to start of flood season (October 15), to avoid migrating salmon. Less than one percent of the Chinook salmon run occurs in the last week of September, most if not all would be hatchery origin, and few if any Chinook would be present in October.
- Sequence the work among the repair areas to minimize disturbance to migrating salmon. For example, activities that are closest to the fish ladder entrance or involve disturbance such as welding would be scheduled later than other activities, such as filling scour holes by hand.
- Schedule disruptive work (e.g., welding, noise-emitting activities and crane use) in the early morning or late afternoon/evening to minimize overlap with migrating salmon, if feasible.
- Schedule work at night or on the outgoing tide, when fewer fish use the fish ladder, if feasible.
- If work cannot be scheduled for early morning or late afternoon, deploy a bubble curtain, turbidity curtain, or similar equipment as a behavioral mechanism to reduce disturbance to fish and wildlife and mask in-water work.
- Optimize barge positioning (i.e., away from the fish ladder entrance and large lock if possible) to reduce disturbance to migrating salmon.
- Station hydraulic concrete pumping equipment on land instead of on a barge, if feasible. If pumping hydraulic concrete from a barge, then is work would be completed in one to two days.
- Turbidity and pH would be monitored to ensure construction activities are in conformance with the protocols and criteria in the draft water quality monitoring plan. Work would be slowed or halted if turbidity exceeds required thresholds

until measurements return to background levels. BMPs would be implemented if pH exceeds required thresholds until measurements return to background levels.

- Have divers in the water to monitor for visual turbidity and watch pipe connections/hose clamps/etc. and connections to the grout bag(s) to watch for grout escaping into the water.
- All tremie concrete fill work shall be performed by an experienced and competent underwater concrete specialty contractor with experience in underwater concrete mix design and placement in seawater environments. All concrete mixing and placement shall be performed under the direct supervision of a qualified underwater concrete supervisor. The contractor shall submit the qualifications of the tremie concrete fill contractor and personnel to the Contracting Officer for approval within 15 days after the award of the contract. Tremie concrete fill work may not begin until the contractor has approved the qualifications of the tremie concrete fill contractor.
- Minimal demolition of concrete from scoured areas when preparing the surface for grout or concrete placement.
- The Corps may reduce fish ladder attraction flow and perform false lockings as an alternate main fish passage route if the fish ladder cannot be used during phases of the construction. This may be for the safety of the divers, to facilitate repairs, or to minimize fish passage through the construction area, depending on the construction activity occurring.
- The Corps would close the secondary entrance to the fish ladder when repairs are close to the entrance to facilitate safe conditions for divers and to direct salmon towards the main entrance away from construction.
- The Corps would coordinate with Federal, State, and Tribal natural resource agencies for additional actions they would recommend for minimizing impacts to the salmon migration.
- The Corps would coordinate with the local Indian Tribes that have usual and accustomed fishing rights in the project area.
- The Corps would coordinate and consult with the Suquamish Tribe for their situational awareness in planning and executing fisheries below the locks. Their usual fishing period for coho salmon could begin September 13 and may extend to October 27; fishing begins when 10,000 coho reach the Locks.
- The Corps would communicate with the Muckleshoot Indian Tribe and Suquamish Tribe regularly during construction if the tribal fisheries and construction are simultaneous. The Corps and the Tribes would coordinate on the feasibility of measures such as working at night or on the outgoing tide, or alternative scheduling with fishers to avoid and reduce impacts to coho fisheries.
- The Corps would coordinate with Federal, State, and Tribal natural resource agencies on closures of fish ladder, reduced flow to the ladder, and attempts to draw fish to the large lock if fish passage is limited.
- Information on fish passage rates and fish behavior would be used to assess project operations and impacts to migratory fish. Corps biologists or appropriate

Corps staff shall be onsite to conduct regular monitoring of fish behavior, discuss daily counts with the Washington Department of Fish and Wildlife (WDFW) and Muckleshoot Indian Tribe (MIT), and note observations of activities that may have on impacts to salmon migration.

- Based on Corps or other Federal, State, or Tribal natural resource observations, the Corps may instruct the contractor to modify repair activities if necessary to minimize impacts to ESA-listed species and treaty tribe fisheries.
- Regular briefings would be held with the Corps construction oversight team on environmental conditions and expected work. The briefings would include review of BMP effectiveness for turbidity control, fish behavior, and any planned changes in activities or new activities that could impact fish migration.

ANTICIPATED IMPACTS OF THE PROJECT

Water Quality: Short-term, localized project-related increases in background turbidity levels and pH would likely occur as a result of hydraulic concrete placement and preparing the scoured areas to be filled. The maximum allowable increase above naturally occurring turbidity and pH for waters designated as “Extraordinary Quality” (i.e., the designation of Shilshole Bay) is 5 nephelometric units (NTU) and 0.2 units, respectively, under State law (WAC 173-201A-612, Table 612).

Best management practices (BMPs) would be used to minimize turbidity and pH increases caused by any potential concrete entering the water. Grout bags or forms would be used to direct the hydraulic concrete placement and limit contact of uncured concrete with water. The minimum amount of concrete necessary for the repairs would be used to limit the amount being placed in the water. Non-toxic construction materials in accordance with CFR Title 40 Protection of Environment Subsection 401.15 Toxic Pollutants would be used. Turbidity and pH would be monitored upstream and downstream of the project site during construction, as required. If turbidity exceeds State water quality standards, particulate-generating activities would be halted and construction methods would be changed until these standards are met. If pH exceeds State water quality standards, the contractor would check that all appropriate BMPs are in place to prevent concrete spills or leakage into the water, such as checking the concrete pipes, pipe connections, secondary containment, and transfer valves on land and in the water for leaks.

Aquatic Resources: The Locks are located at the mouth of the LWSC that extends from deep water in Puget Sound through Shilshole Bay, the Locks, Salmon Bay, Lake Union, Portage Bay and Union Bay to deep water in Lake Washington. The location of the scour repair is below the spillway in Shilshole Bay. This area is urban and the habitat reflects this development. There are numerous bulkheads, docks, pilings, and a large marina. There is very little cover such as submerged and overhanging large wood, aquatic vegetation, large rocks, or boulders.

The repair would not affect juvenile salmonids because they outmigrate through the Locks primarily during the months of May-July, at least two months before the proposed

construction begins. Adult salmon typically migrate through the fish ladder or large lock June-October. Projected impacts to aquatic resources from the proposed interim repair action include possible delay of adult salmon during migration due to water quality, divers, and machinery in the water generating noise that could cause the salmon to retreat to the waters of Puget Sound. The delay may be short-term, where adult salmon return to the fish ladder quickly or they move to the Locks. The delay may be longer if the fish wait until the activity ends, or if they return to Puget Sound and then return to the project seeking out available pathways. Salmon that spend time searching for the alternative passage through the large lock could leave them vulnerable to predation by marine mammals. Conservation measures and in-water work timing are expected to avoid and minimize disturbance to the majority of adult salmonids so that effects of the repair would be discountable to salmonid populations.

The aquatic impacts could change if the work requires low velocities for diver access. If the fish ladder must close for short periods (i.e., one to two days) during the day, it could delay their migration or result in use of the alternate pathway through the large lock. Fish ladder closure at night or during the outgoing tide are preferred over daytime because salmon migrate during the day more than at night, but may not be feasible to implement. The proposed action assumes any fish ladder closure delay would occur in October when no Chinook salmon are present and there are fewer coho salmon. Coho salmon are present in September and October. Based on counts from 2009-2019 (which end October 2 of each year), approximately 50% of the coho would have passed the Locks by about September 15. It is assumed migration ends in November. Conservation measures would be used to avoid and minimize disturbance to coho migration, and the Corps would coordinate and consult with the Muckleshoot Indian Tribe and Suquamish Tribe to avoid and minimize impacts to their coho salmon fisheries.

Short-term, localized project-related increases in turbidity and pH levels would likely occur as a result of in-water work, but are not expected to result in long-term adverse effects to aquatic species or a significant net change in the function of the in-water habitat. Small aquatic fish and invertebrates would be disturbed so they move from the scoured areas before concrete is placed; this action would not be expected to cause substantial negative effects to these populations.

Terrestrial Resources/Wildlife: The proposed repair sites are entirely in-water, and previously developed land would be used for staging areas. There would likely be minor and temporary displacement of wildlife on the adjacent shoreline due to construction noise. If staging occurs on West Commodore Way, the presence of equipment (e.g., pipes) going to the repair sites would temporarily displace birds, reptiles, rodents, and other small vertebrates, but removal of shrub or tree vegetation is not expected so there would be no loss of cover, perching, foraging, or nesting habitat. This disturbance would not be significant because human activity is common due to the popularity of the Locks as a tourist attraction, and similar vegetation and habitat in adjacent areas for displaced animals is available.

Construction of the project would occur outside the great blue heron nesting season (February 1–August 31) and the general breeding season for migratory birds (April 16–August 15). Therefore, impacts to nesting birds, including herons in the colony to the west of the project site would be avoided.

Threatened and Endangered Species: The following species are listed under the Endangered Species Act (ESA), and could potentially occur in the project area during the proposed action:

- Chinook salmon (*Oncorhynchus tshawytscha*; threatened)
- North American green sturgeon (*Acipenser medirostris*; threatened)
- Southern Resident killer whale (SRKW; *Orcinus orca*; endangered)

Due to lack of suitable habitat in the project area vicinity, the marble murrelet, streaked horned lark and the yellow-billed cuckoo are not expected to occur within the project area. Bull trout are rarely observed at the Locks and, if present, they tend to occur between May and June. Adult steelhead have historically migrated upstream past the Locks between December and May, and juveniles downstream between April and May, and so they are not expected to be present during the proposed repair operations. Therefore, these species are not be considered further in the Corps' analysis because they are likely absent from the project area during the proposed work window.

The primary effects of the proposed action on Chinook salmon, if the repair occurs in September while fish are present, is that there would be some temporary disturbance to returning adult fish as they approach the vicinity of the fish ladder while the repair operations are occurring. The harassment and potential interruption to the migration would result in a very low likelihood of adults not successfully spawning. If the repair occurs in October there may be little or no effect as Chinook may not be present, as they would have already migrated upstream. Due to the temporary disturbance, and assuming the work begins in the late September in-water work period, the Corps determined the action would not have substantial adverse effects to adult Chinook salmon and no effect to juvenile Chinook salmon as they would have already migrated past the Locks between May and July to enter Puget Sound. The repair action would result in short-term and discountable impacts to critical habitat in the spillway apron area. The action itself is to ensure the fish ladder facility and spillway can continue to function as required.

The proposed repair occurs outside the SRKW habitat use areas and would only have a discountable effect to their prey resources. The area with anticipated effects is limited to within 400 feet of the spillway, and SRKW are not known to venture into the vicinity of the Locks. This may be due to the disturbance and noise associated with high vessel traffic of over 70,000 vessels annually passing through the Locks. SRKW are dependent on Chinook salmon as prey more than any other fish species. The proposed repair operations would affect some Chinook salmon as they attempt to migrate past the Locks using the fish ladder. The two Chinook salmon stocks that transverse the Locks (i.e., the Cedar River and Sammamish River stocks) represent about three to five

percent of the total Puget Sound Chinook salmon abundance. The proposed repair operations at the fish ladder would start well after the peak of the two Chinook runs so only a small portion of the fish in these runs (i.e., less than one percent by the last week of September) have the potential to be affected by the repair operations; therefore, the repair is not expected to have a substantial negative effect on SRKW prey.

It is extremely unlikely that green sturgeon are attracted to the Locks and the project area as entry to the project is through a high use marine environment, the habitat is highly modified, and the tailrace is rock and concrete that lacks attractive prey items. Although a few tagged individuals were detected in Puget Sound, green sturgeons are very infrequently observed in the Sound and there are no records of the species in or near the LWSC. For these reasons, the Corps believes that the proposed repair would have a negligible effect on green sturgeon. There is no critical habitat designated for green sturgeon in the project area so there would be no effect to their critical habitat.

The Corps has prepared a biological assessment (BA) pursuant to Sec. 7(a)(2) of the Endangered Species Act (ESA) for consultation with the National Marine Fisheries Service (NMFS).

Cultural Resources: The Corps has reviewed the undertaking for purposes of Section 106 of the National Historic Preservation Act (NHPA) and has determined that the project meets the definition for a routine activity listed in the Programmatic Agreement Regarding the Operation and Maintenance of the Lake Washington Ship Canal Project. Further 106 consultation is not required for this undertaking.

Air Quality: Construction vehicles and heavy equipment used during the repair may result in a temporary and localized increase in gasoline and diesel exhaust fumes. The small area of construction and the short duration of the work would limit the impact to air quality which is expected to be well below the *de minimis* threshold; in addition, the project is in an attainment area and would be exempt under 40 CFR Section 93.153(c)(2)(iv) from conformity determination requirements. The effect of carbon dioxide emissions on global climate change from the scour repair is anticipated to be insignificant.

Noise and Lights: The repair would increase localized ambient noise levels during construction. However, given the urban location adjacent to the working Locks and the lower location of the repair site compared to the surrounding development, it is anticipated that any noise would be negligible. If there is work at night, a temporary noise variance from the City of Seattle would be obtained and lighting would be directed at the repair to minimize disturbance to surrounding residences consistent with the City of Seattle Shoreline Master Plan. No long-term change in noise levels would occur as a result of the repair.

Traffic: Construction-related traffic may have caused temporary increases to, and disruption of, local traffic. Flaggers and signs would be used as needed to direct traffic

safely around the construction sites. The contractor would obtain the appropriate traffic control plan permits from the City of Seattle as necessary.

Cumulative Effects: The proposed repair would not appreciably alter the baseline condition. Cumulative effects would be fully considered in the environmental documentation, as required under NEPA and ESA.

EVALUATION

The Corps has made a preliminary determination that the environmental impacts of the proposal can be adequately evaluated under NEPA through preparation of an EA. Preparation of an EA addressing potential environmental impacts associated with the Locks interim urgent scour repair is currently underway.

In accordance with Section 7(a)(2) of the ESA, the Corps has drafted a Biological Assessment and is consulting with NMFS and USFWS regarding the impact of the repair on listed species and/or designated critical habitat. The Biological Assessment was submitted to NMFS in May 2020, and documentation for the determination of no effect to species under USFWS jurisdiction or their critical habitat is being prepared.

The purpose of the Federal Water Pollution Control Act (33 U.S.C § 1252 et seq.), commonly referred to as Clean Water Act (CWA), is to restore and maintain the chemical, physical, and biological integrity of the nation's waters by preventing point and nonpoint pollution sources, providing assistance to publicly-owned treatment works for the improvement of wastewater treatment, and maintaining the integrity of wetlands.

Even though the Corps does not issue Section 404 permits to itself for its Civil Works activities, the Corps must comply with the substantive requirements of Section 404 and 401 under the CWA. Pursuant to both Section 404 of the CWA (33 USC 1344(f)(1)(b)) and Federal Regulations 33 CFR 323.4(a)(2), the proposed activity falls within an exemption since the activity falls within the parameters of maintenance. Therefore, the repair does not require a Section 404(b)(1) evaluation or Section 401 certification.

33 USC 1344(f)(1)(B) provides that discharge of material “for the purpose of maintenance, including urgent reconstruction of recently damaged parts, of currently serviceable structures such as dikes, dams, levees, groins, riprap, breakwaters, causeways, and bridge abutments or approaches, and transportation structures” is exempt from regulation as fill. The scour repair is limited to maintenance of an existing serviceable dam and does not propose to change the scope, character, or size of the original fill design, so the discharge of fill material into Waters of the United States (U.S.) is exempt. In addition, filling the scoured areas with hydraulic concrete that do not contain toxic pollutants as listed under Section 307 of the CWA is consistent with the maintenance describe in the exemption.

The repair would be conducted within the existing footprint of the stilling basin apron as constructed in 1916. The components of the repair include replacing infill concrete from

1974 between the apron and the fish ladder and filling holes and scours within the fish ladder wall. This work would not change the character, scope, or size of the structure from the original fill design. The inclusion of grout bags in the scour hole between the stilling basin apron and fish ladder, and sealing the holes in the cofferdam along the fish ladder wall is not considered to constitute a modification of that structure that would change its character because the new fill would conform to the original configuration and size of the original fill. Only as much hydraulic concrete necessary for an adequate repair would be applied and overfilling of scour holes would be avoided to maintain a similar profile to the surrounding structure. The USACE considers modern hydraulic concrete formulations as analogous to the 1916 and 1974 concretes used in the initial construction of the stilling basin apron and fish ladder remodel.

The Coastal Zone Management Act (CZMA) is applicable to the proposed project because the scour repair is in a coastal county. In accordance with the Shoreline Management Act of 1972 (RCW 90.58), the Corps finds this proposal consistent to the maximum extent practicable with the State of Washington Shoreline Management Program, as well as with the other CZMA enforceable policies. The Corps requested Coastal Zone Management (CZM) consistency concurrence from the Washington State Department of Ecology in May 2020.

In preparation of the environmental documentation for this project, coordination would be, has been conducted, or is ongoing with the following agencies:

(1) National Marine Fisheries Service
(2) U.S. Fish and Wildlife Service
(3) Washington Department of Ecology
(4) Washington Department of Fish and Wildlife
(5) Washington Department of Natural Resources
(6) Muckleshoot Indian Tribe
(7) Suquamish Tribe

The repair would be analyzed for its effects on Tribal Treaty Rights or rights reserved to tribes through Executive Order or other legal instruments. Effects of the proposed repair may occur within the usual and accustomed fishing areas of the Muckleshoot Indian Tribe and Suquamish Tribe. The Corps will coordinate and consult with these tribes on the action.

COMMENT AND REVIEW PERIOD

The Corps invites submission of factual comment on the environmental impact of the repair from the public; Native American Nations or tribal governments; federal, state, and local agencies and officials; and other interested parties in order to consider and evaluate the repair. Comments are used to assess impacts on ESA listed species, historic/cultural properties, water quality, general environmental effects, as well as the other public interest factors listed above. The Corps would consider all submissions received before the expiration date of this notice. The nature or scope of the repair may

be changed upon consideration of the comments received. The Corps would initiate an environmental impact statement (EIS) and afford the appropriate public participation opportunities attendant to an EIS if significant effects on the quality of the human environment are identified and cannot be mitigated.

COMMENTS TO THE CORPS OF ENGINEERS

Submit comments to this office, Attn: Planning, Environmental and Cultural Resources Branch, no later than *20 days after the posting of this notice* to ensure consideration. In addition to sending comments via mail to the above address, comments may be emailed to Kaitlin.E.Whitlock@usace.army.mil. The NOP can be found online at the link below.

Project Name: Hiram M. Chittenden Locks (Locks) Urgent Interim Scour Repair

http://www.nws.usace.army.mil/Missions/Environmental/Environmental-Documents/

Requests for additional information should be directed to Ms. Katie Whitlock at 206-764-3576 or the above email address.

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, SEATTLE DISTRICT
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

April 20, 2020

PROJECT LOCATION AND DESIGN DATA, MAPS AND RELATED INFORMATION

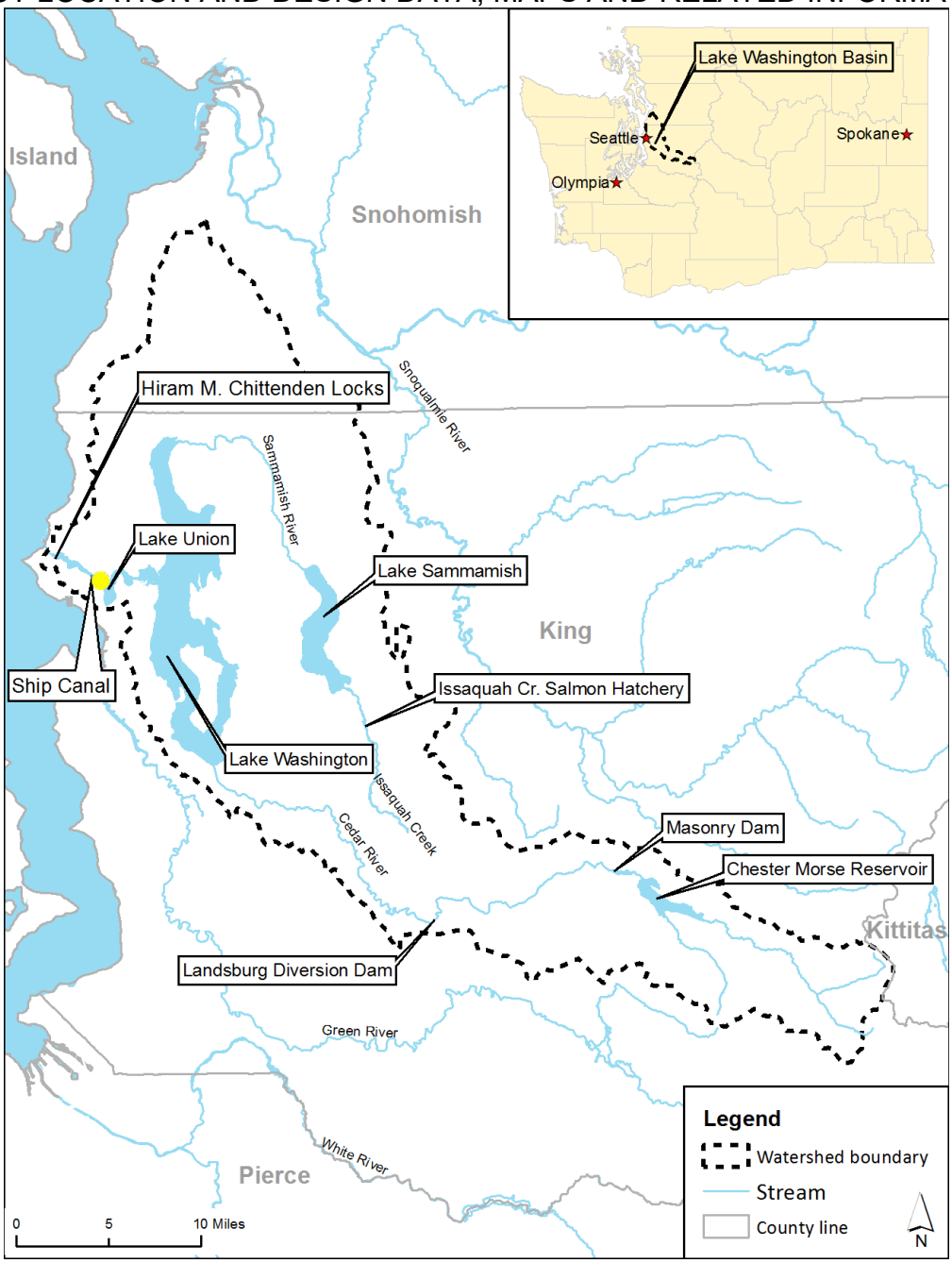

Figure 1. General Project Location for the Locks Urgent Interim Scour Repair. Yellow dot shows the approximate project location.

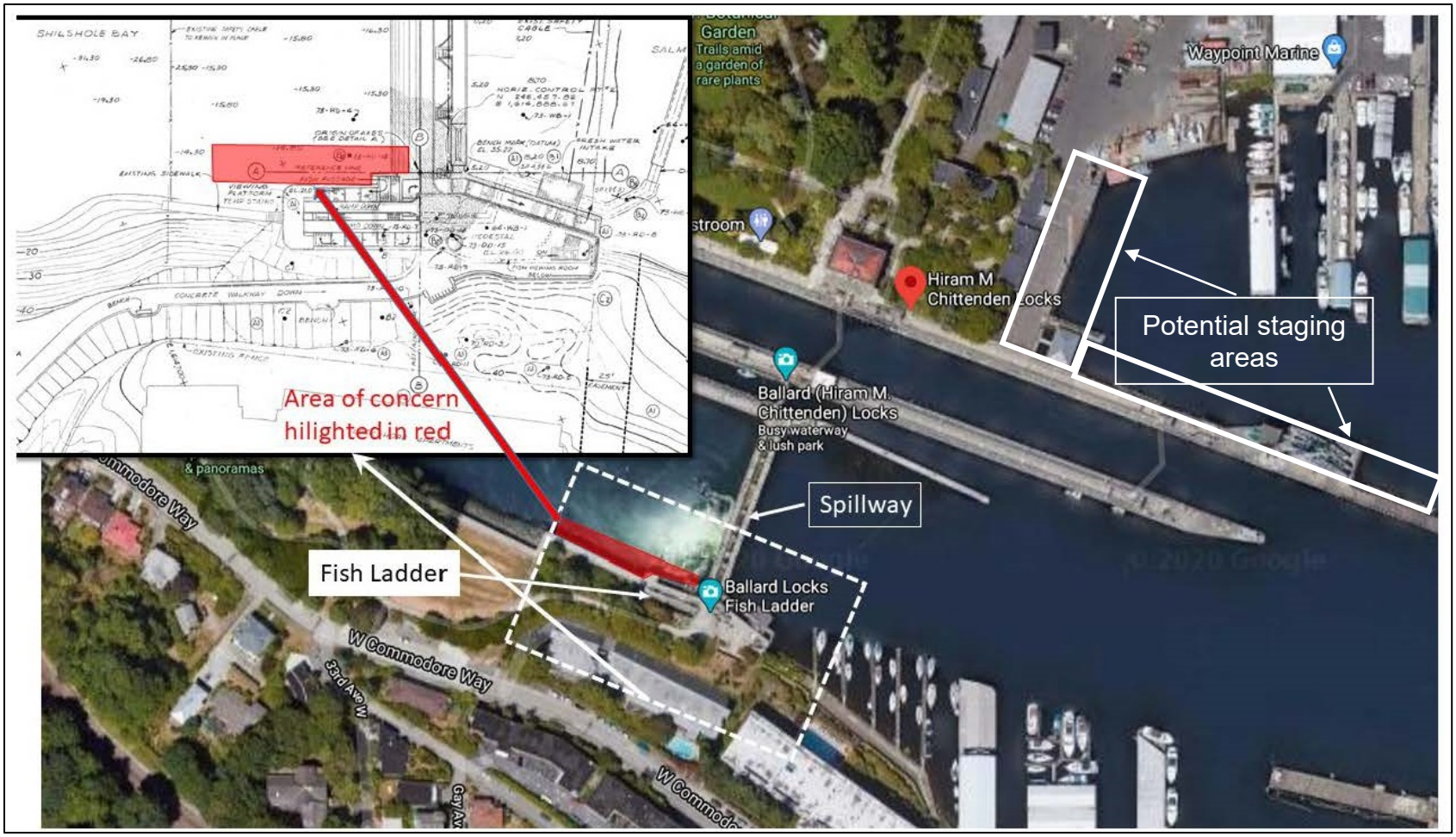

Figure 2. Overview of the scour location (red box) between the stilling basin apron and fish ladder at the Locks. The inset box shows the scour location related to the fish ladder structure. Staging areas could be along the north side of the large lock behind the maintenance buildings, along West Commodore Way on the south side of the fish ladder, or on previously developed areas around the fish ladder.

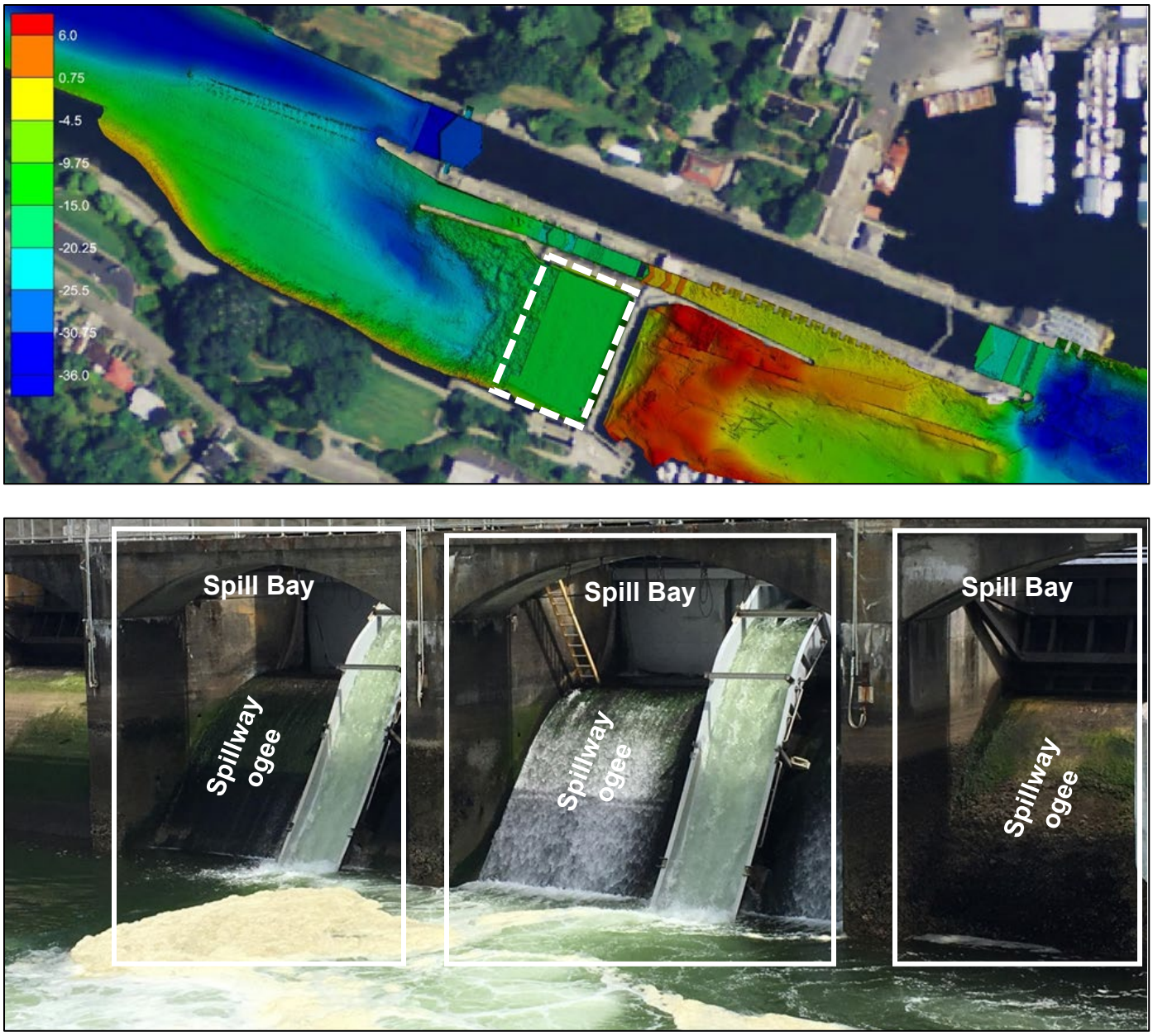

Figure 2. Location of the concrete stilling basin apron (top panel; outlined in white dashes) as seen in a 2016 bathymetric survey. The colors indicate depth with red as the shallowest and blue as the deepest. The bottom panel shows the configuration of three of the six spill bays and spillway ogees on the spillway. There are six spill bays at the Locks and each contains a spillway ogee. Note that the smolt flumes depicted in the lower figure are installed every spring to help provide juvenile fish safe passage to the Puget Sound and are removed prior to September, and so would not be present during the proposed repair operations.

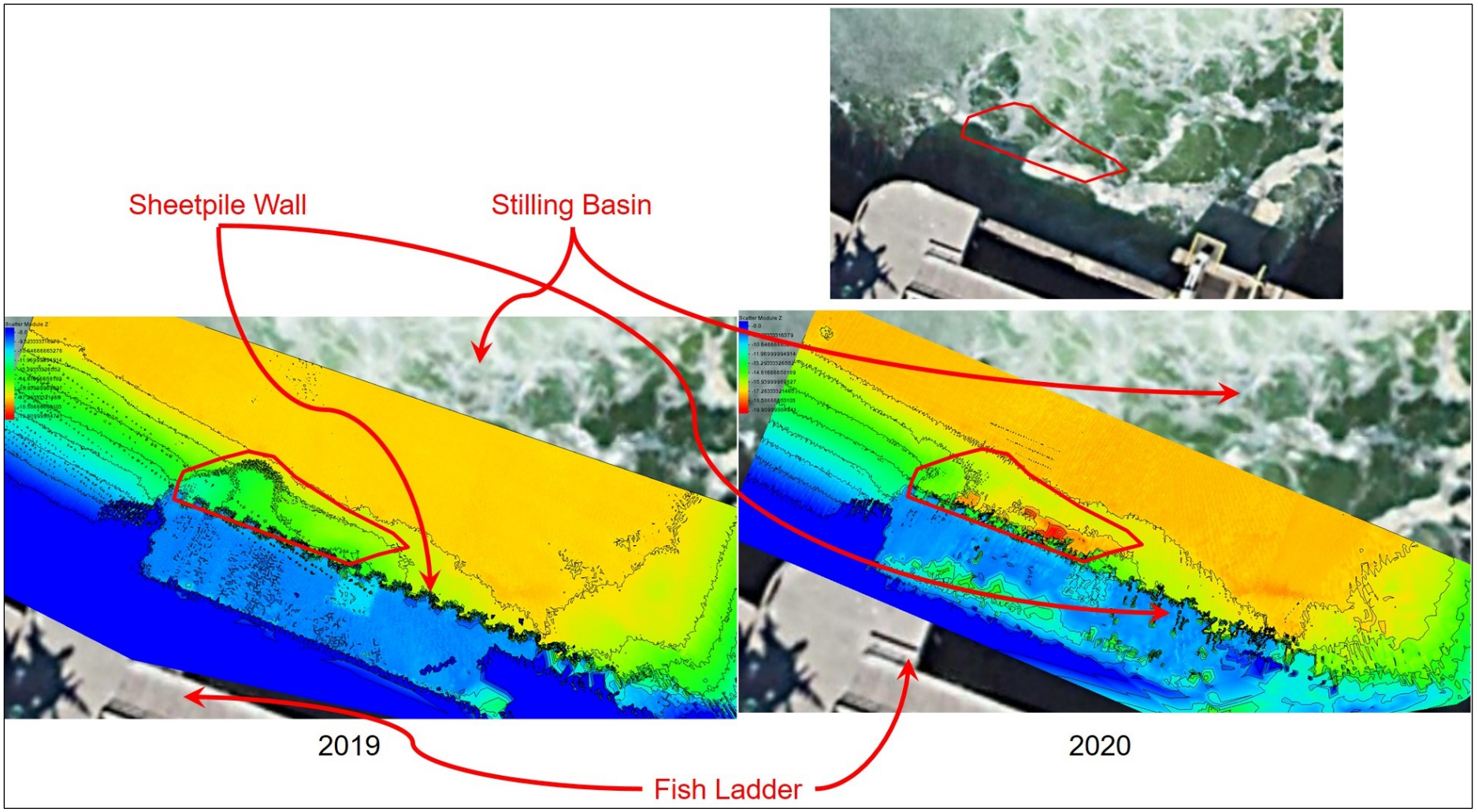

Figure 3. Bathymetric survey of the scoured area (red outline) near the fish ladder in 2019 and 2020. The degree of scour is represented by color, where blue is the shallowest, followed by green, yellow, orange, and red is the deepest. The color change between 2019 (left panel) and 2020 (right panel) shows the erosion in 2020 is about four feet deeper at the deepest point than it was in a 2019 bathymetric survey.

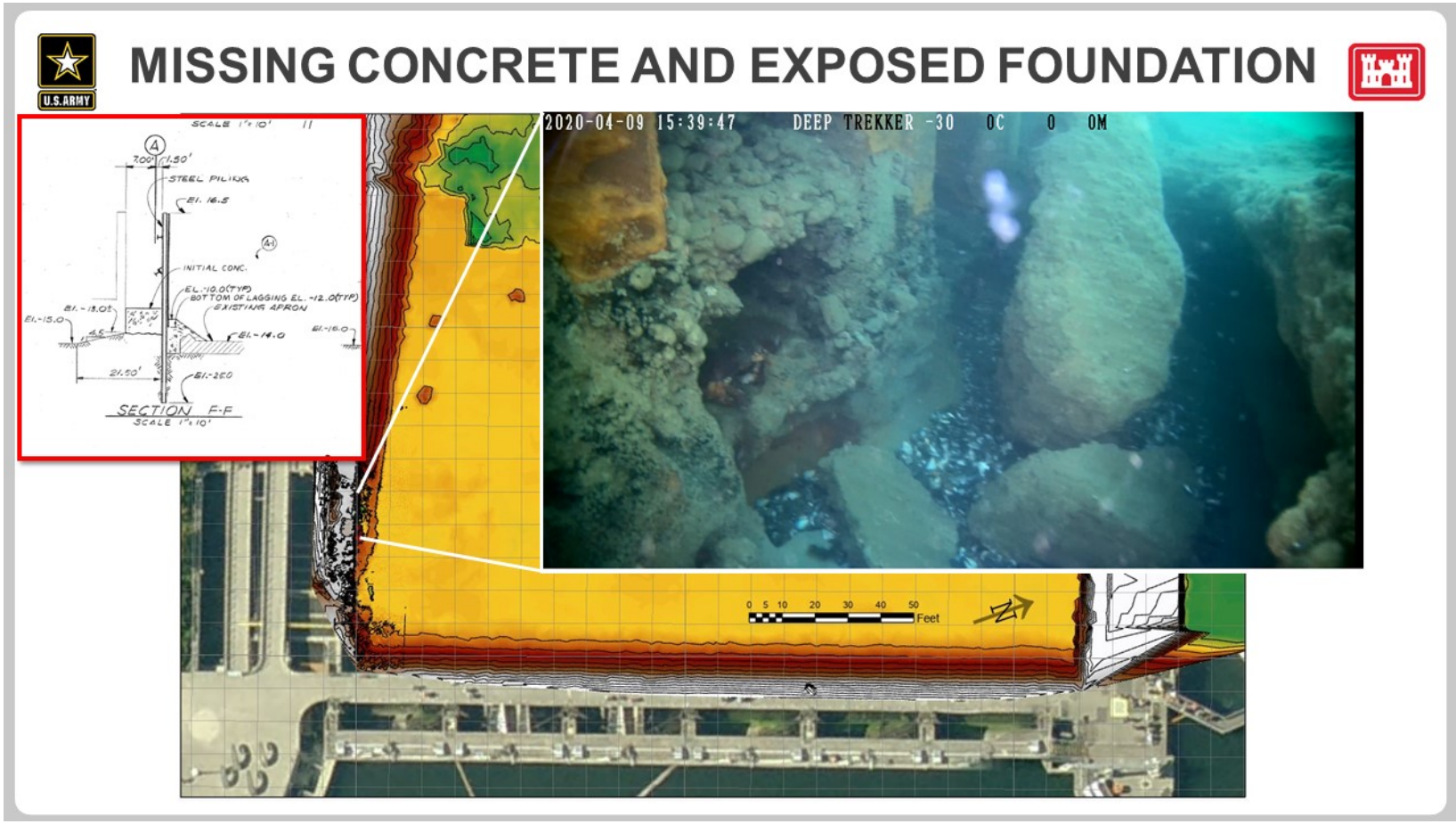

Figure 4. Missing concrete and exposed foundation between the stilling basin apron and the fish ladder sheet pile wall.

Figure 5. View of the scoured area (red box) between the stilling basin apron and the fish ladder from the observation platform.

Figure 6. Example of a hole on the spillway ogee surface.

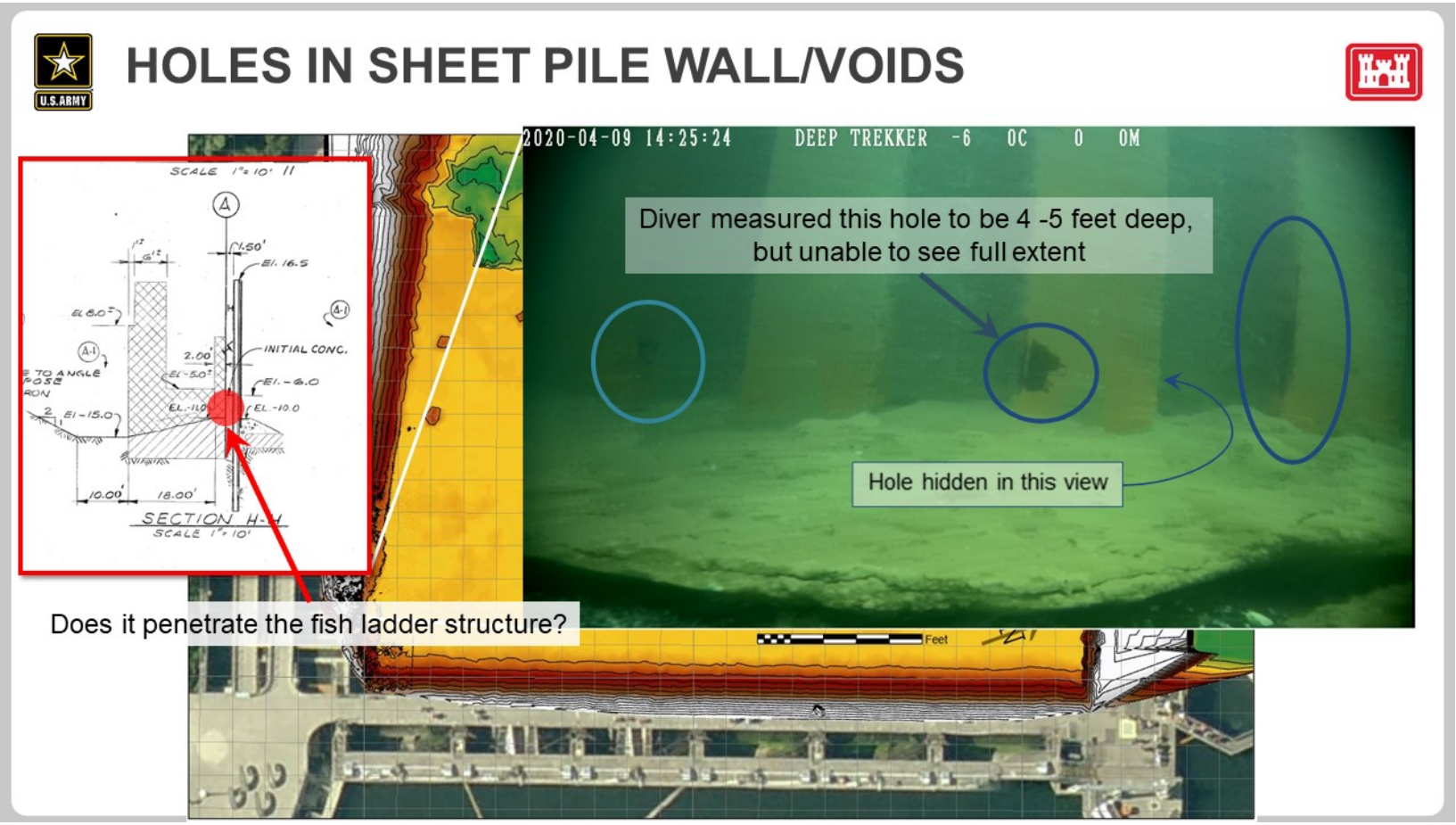

Figure 7. Holes in the sheet pile wall of the fish ladder with voids of unknown extent behind them.

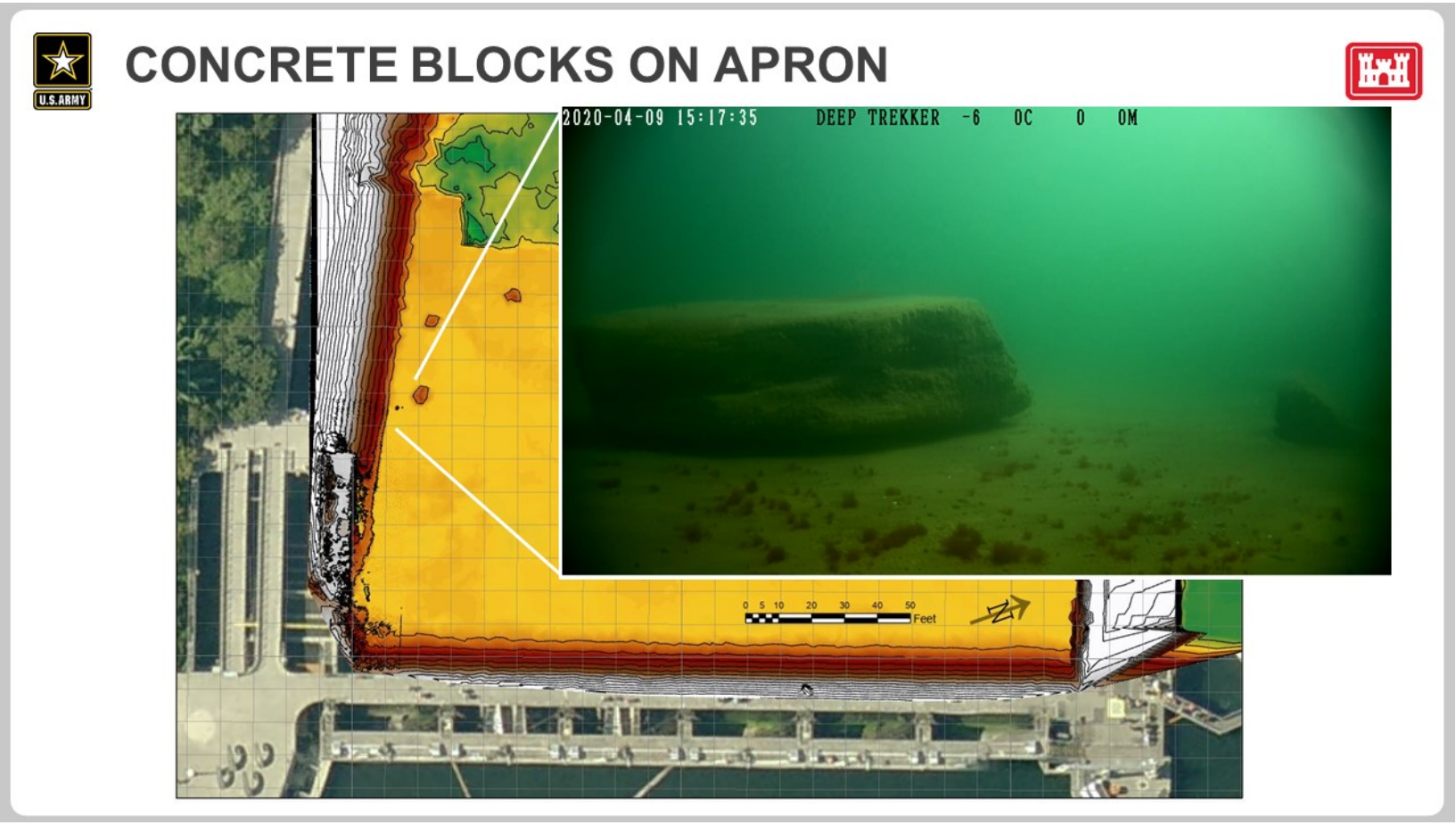

Figure 8. Three to four concrete blocks from the scour area between the stilling basin apron and fish ladder are on the stilling basin apron. These would be removed.