

WINGS LANDING TIDAL HABITAT RESTORATION PROJECT

REVISED MAMMAL BEST MANAGEMENT PRACTICES

The proposed Wings Landing Tidal Habitat Restoration Project (Project or Proposed Project) would restore approximately 267.02 acres of managed marsh, managed perennial channels, managed seasonal channels, and uplands to a tidal marsh ecosystem to benefit smelt and salmonid species. The Proposed Project would also benefit upland marsh dependent special status species such as the California and federally endangered salt marsh harvest mouse (*Reithrodontomys raviventris*) (SMHM), the California threatened California Black Rail (*Laterallus jamaicensis coturniculus*), and the California and federally endangered California Ridgway's Rail (*Rallus obsoletus obsoletus*). The Proposed Project would reconnect the marsh-adjacent subtidal channels in Boynton, Peytonia, and Suisun Sloughs to the newly restored tidal and subtidal marsh within the Project Site. Existing tidal marsh on the exterior of the levees would be enhanced and protected, while managed marsh habitat interior of the levees would be restored to tidal marsh, resulting in a net increase of approximately 243.70 acres of tidal wetlands including approximately 6.72 acres of restored tidal channels, and approximately 236.98 acres of restored tidal marsh. The Proposed Project was designed to restore the site-specific historic hydrologic regime to increase the extent and natural development of sinuous, dendritic channels, as well as provide transitional uplands and high-water refugia for terrestrial marsh species and sea level rise accommodation. The Concept Design is included as **Figure 1a**, and the haul route polygons are depicted in **Figure 1b**.

PROPOSED ACTIVITIES AND BENEFITS TO SMHM

Construction would be completed in one construction season and has a maximum disturbance area of approximately 74.70 acre area (**Figure 2**) including approximately 43.83 acres of temporary and approximately 30.57 acres of permanent impacts (Project Disturbance Area). Approximately 43.83 acres of temporary impacts would include haul routes (approximately 18.37 acres), the staging area (approximately 1.70 acres), water control structure removal (approximately 0.018 acres), and Proposed Project element buffer areas (approximately 23.75 acres) (**Figure 1**). Proposed Project element buffer areas include 20 feet on each side of all Proposed Project element polygons to account for work space adjacent to each element, with the exception of most tidal areas exterior of the levees. Approximately 30.57 acres of permanent impacts would occur within the footprints of the Proposed Project elements and associated borrow and excavated material placement areas. All impacts resulting from the Proposed Project, both temporary and permanent, would benefit the ecology of the tidal marsh ecosystem onsite once the Proposed Project is complete. The Proposed Project design would benefit listed fish species as well as other native fish and wildlife species, specifically the SMHM. Anticipated benefits for the SHMH include:

- Elimination of the existing managed wetland flooding which decreases the available habitat for a significant proportion of the year.
- Removal of frequent disturbance associated with maintenance of the managed wetlands

infrastructure and vegetation.

- Conversion of managed marsh to tidal marsh, resulting in a net increase of approximately 243.70 acres of tidal habitat including approximately 236.98 acres of tidal marsh and approximately 6.72 acres of restored tidal channels.
- Permanent protection of the Project Site, eliminating future impacts to SMHM from management activities or land use change.
- Post-restoration colonization by emergent marsh vegetation would provide approximately 236.98 acres of new emergent marsh habitat.
- Contribution toward the tidal restoration objectives of the Suisun Marsh Sub-region of the USFWS 2013 Recovery Plan for Tidal Marsh Ecosystems of northern California and the Suisun Marsh Habitat Management, Preservation, and Restoration Plan (SMP).

ENVIRONMENTAL COMMITMENTS AND CONSERVATION MEASURES

The SMP and its associated Biological Opinion (08ESMF00-2012-F-0602-2) contain Environmental Commitments (ECs) and Conservation Measures (CMs) respectively for SMHM that only apply to restoration projects (not managed wetland annual activities). The “Project Proponents” (DWR and Natural Resources Group, Inc. (NRG)) plan to implement all ECs, including those listed below, but are requesting flexibility where these ECs and CMs would be ineffective and infeasible to implement.

ECs and CMs for which the Project Proponents propose changes due to feasibility constraints or for improved benefits include:

- Exclusion fencing with plastic sheeting around the entire construction footprint immediately after clearing vegetation;

EXISTING WETLANDS MANAGEMENT WETLANDS ACTIVITIES:

The entire interior of the approximately 267.02-acre Proposed Project Site has been intensively managed as a duck club since the 1940’s. Historic and existing pre-project (baseline) duck club management includes disturbance by heavy equipment to approximately 253.50 acres of the 267.02-acre Project Site, as well as the 1.7-acre staging area (**Figure 3**). Baseline duck club management includes weed-eating, disking, mowing, flooding, draining, water control structure maintenance, and contouring to improve conditions for waterfowl. These actions are currently being conducted in full compliance with the US Army Corps of Engineers Suisun Marsh Regional General Permit 3 (Permit #2012-00258N) and the associated Biological Opinion from the US Fish and Wildlife Service (USFWS). Baseline duck club management activities would continue until the Proposed Project begins, on or around September 1, 2020.

Examples of baseline duck club management include:

- Use of heavy equipment such as weed-eaters, mowers, dozers, backhoes, discs, compactors, and more for replacing blinds, repairing levees, vegetation management, and maintaining water control structures.

- Flooding the marsh from mid-October to late February or early March, and drying the marsh in the summer.
- Flooding and draining to leach salinity, control vegetation, and manage mosquito populations.
- Vegetation management with tractors for mowing, mulching, and discing including annual mowing to manage habitat and provide foraging opportunities for waterfowl. Mowing activities are not limited by the RGP3.
- Levee maintenance with excavators, compactors, backhoes, and tractors.

RESTORATION IMPACTS

Restoration construction would result in a Project Disturbance Area of a maximum of 74.70 acres. This includes the footprints of Proposed Project elements, the haul routes, and the staging area, plus a 20 foot buffer around all Proposed Project elements, except most areas exterior of the levees (**Figure 2**). The entire Project Disturbance Area is within locations that are currently subject to disturbance from duck club management.

TIDAL MARSH RESTORATION AND SALT MARSH HARVEST MOUSE AVOIDANCE AND MINIMIZATION MEASURES:

The Proposed Project would implement all approved programmatic ECs and CMs, with flexibility requested for feasibility and improved protection. In order to provide equivalent or better protection of SMHM, the Project Proponents propose:

- One additional Avoidance and Minimization Measure that would apply to the Proposed Project as a whole
- Alternative measures to exclusion fencing in impact areas where necessary
- Minor language edits that would improve EC effectiveness

ADDITIONAL PROPOSED AVOIDANCE AND MINIMIZATION MEASURE:

Current duck club-related vegetation maintenance, specifically mowing, will continue within the Project Disturbance Area in order to prevent the development of desirable habitat. Vegetation will be mowed to as short as possible and will be mowed at least four times per year or as needed to prevent vegetation from growing taller than 1 inch.

Maintaining vegetation within the Project Disturbance Area to less than 1 inch would prevent the development of suitable habitat, which if that were to occur, would necessitate additional impacts from vegetation removal. Aside from mowing within the Project Disturbance Area, baseline duck club management activities would not continue once the Proposed Project begins.

EXCLUSION FENCING:

The SMP includes the following BMP for all construction areas in SMHM habitat:

To prevent salt marsh harvest mouse from moving through the Project Site during construction, temporary exclusion fencing will be placed around a defined work area before construction activities start and immediately after vegetation removal. The fence should be made of a material that does not allow salt marsh harvest mouse to pass through or over, and the bottom should be buried to a depth of 2 inches so that mice cannot crawl under the fence. Any supports for the salt marsh harvest mouse exclusion fencing must be placed on the inside of the project area.

The Project Proponents will implement this exclusion fencing avoidance measure within the staging area only.

New data (Sustaita et. al. 2011, Smith et. al. 2018) show that SMHM in Suisun Marsh inhabit other wetland vegetation communities besides those dominated by pickleweed (*Salicornia*), including *Schoenoplectus* and *Phragmites* dominated vegetation communities. As a result, virtually the entire Project Site would be considered habitat for SMHM in the absence of duck club management activities. Exclusion fencing for all activities in previously cleared SMHM habitat would require over 11 miles of fencing. Installation and daily inspection of this fencing would increase the amount of habitat impacted and time that the area is disturbed. For example, many Proposed Project elements would be constructed in a single low tide or within one to two workdays. It would take several days to set up the fencing for those features and in many cases, double the impact area.

The time required to install and remove this amount of exclusion fencing would likely increase the temporal impacts of the Proposed Project by adding a second construction season. This would result in twice the impacts and disturbance from mobilization, demobilization, as well as setting up over eleven miles of exclusion fencing two times.

In accordance with the SMP, the Project Proponents intend to install fencing that would exclude wildlife in the staging area, where equipment would be parked overnight throughout the construction season (**Figure 3**). This area with exclusion fencing would be subject to other SMP requirements, including inspection of the exclusion fencing. In the rest of the Project Site, the Project Proponents would implement the following in lieu of fencing:

In lieu of fencing that excludes mice from entering the construction area, vegetation clearing and construction will not occur in salt marsh harvest mouse habitat.

OTHER PROPOSED CHANGES

Currently, the following EC and CMs are included in the SMP and biological opinion. The Project Proponents are proposing to make the small changes shown below to improve Project-specific effectiveness of the ECs.

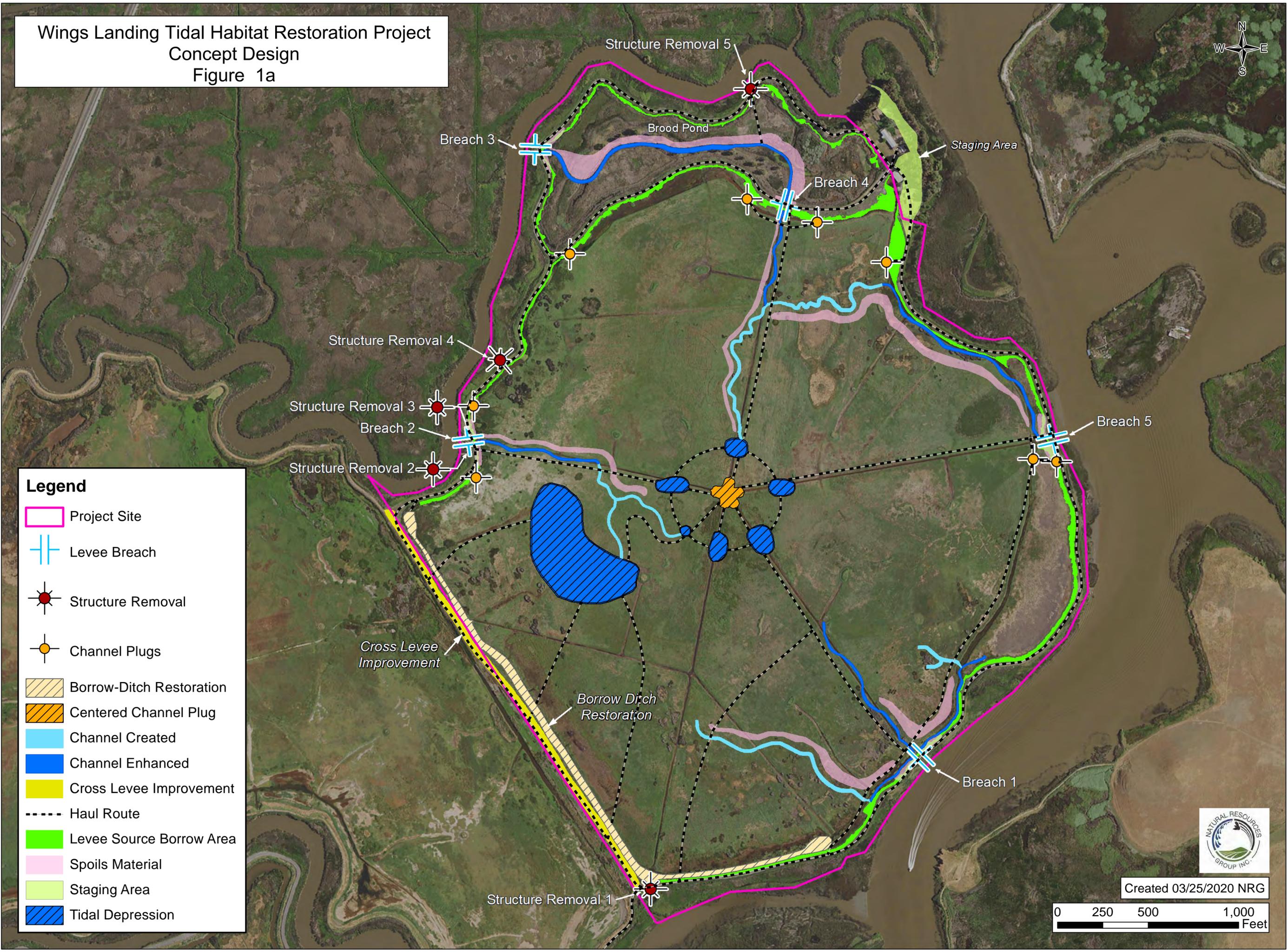
*If a ~~salt marsh harvest mouse~~ **any small rodent** is discovered, construction activities will cease in the immediate vicinity of the individual until CDFW and USFWS are contacted **or the individual has been allowed to leave the construction area on its own.***

REFERENCES

Sustaita, Diego, P.F. Finfrock, L. Patterson, L. Barthman-Thompson, and S. Estrella. 2011. "Salt Marsh Harvest Mouse Demography and Habitat Use in the Suisun Marsh, California." *The Journal of Wildlife Management* 75(6):1498-1507.

Smith, Katherine R., M.K. Riley, L. Barthman-Thompson, I. Woo, M. J. Statham S. Estrella, and D. A. Kelt. 2018. "Towards salt marsh harvest mouse recovery: a review." *San Francisco Estuary and Watershed Science* 16(2):1-6.

Wings Landing Tidal Habitat Restoration Project
 Concept Design
 Figure 1a

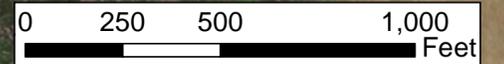


Legend

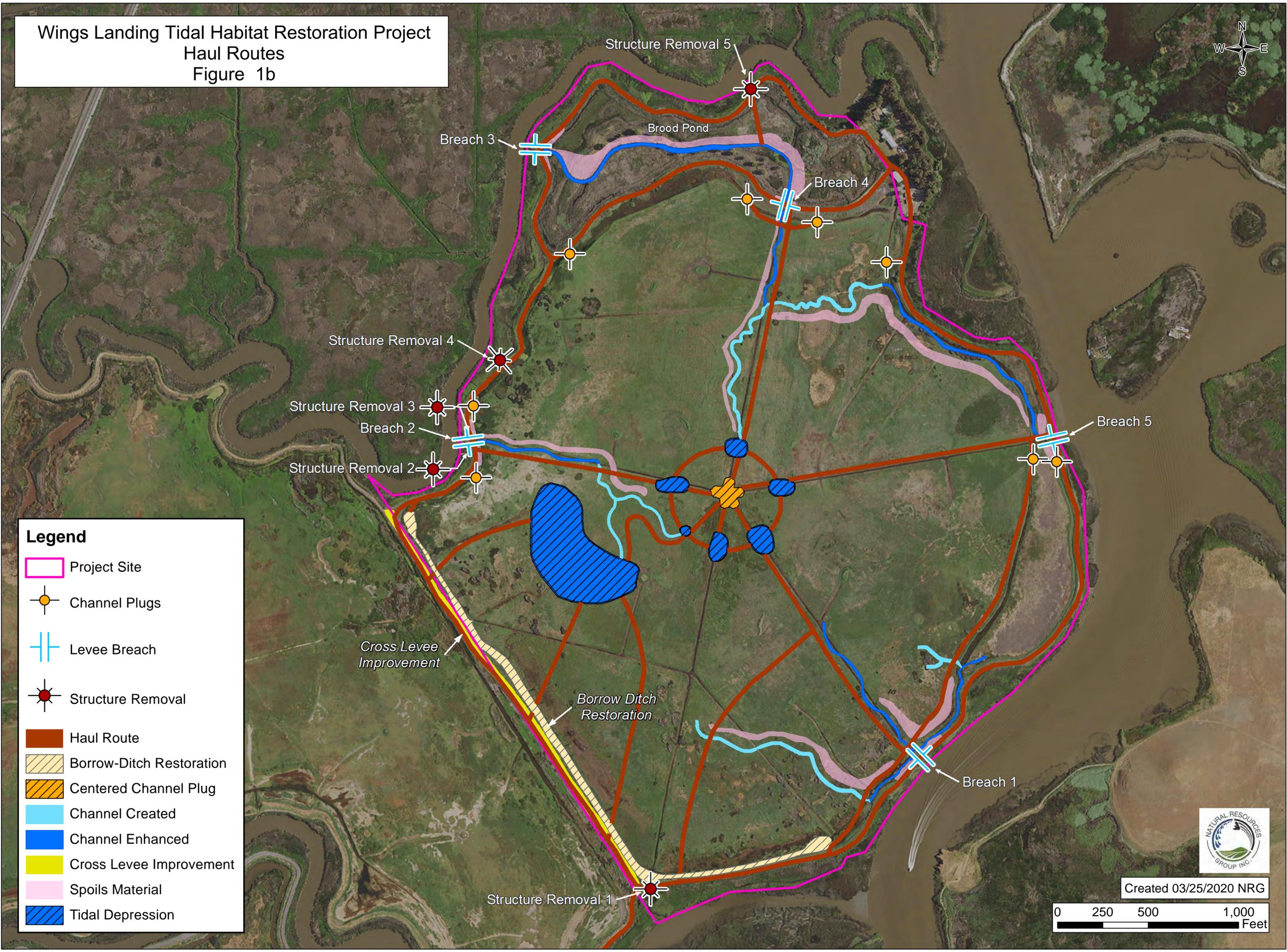
- Project Site
- Levee Breach
- Structure Removal
- Channel Plugs
- Borrow-Ditch Restoration
- Centered Channel Plug
- Channel Created
- Channel Enhanced
- Cross Levee Improvement
- Haul Route
- Levee Source Borrow Area
- Spoils Material
- Staging Area
- Tidal Depression



Created 03/25/2020 NRG



Wings Landing Tidal Habitat Restoration Project
 Haul Routes
 Figure 1b



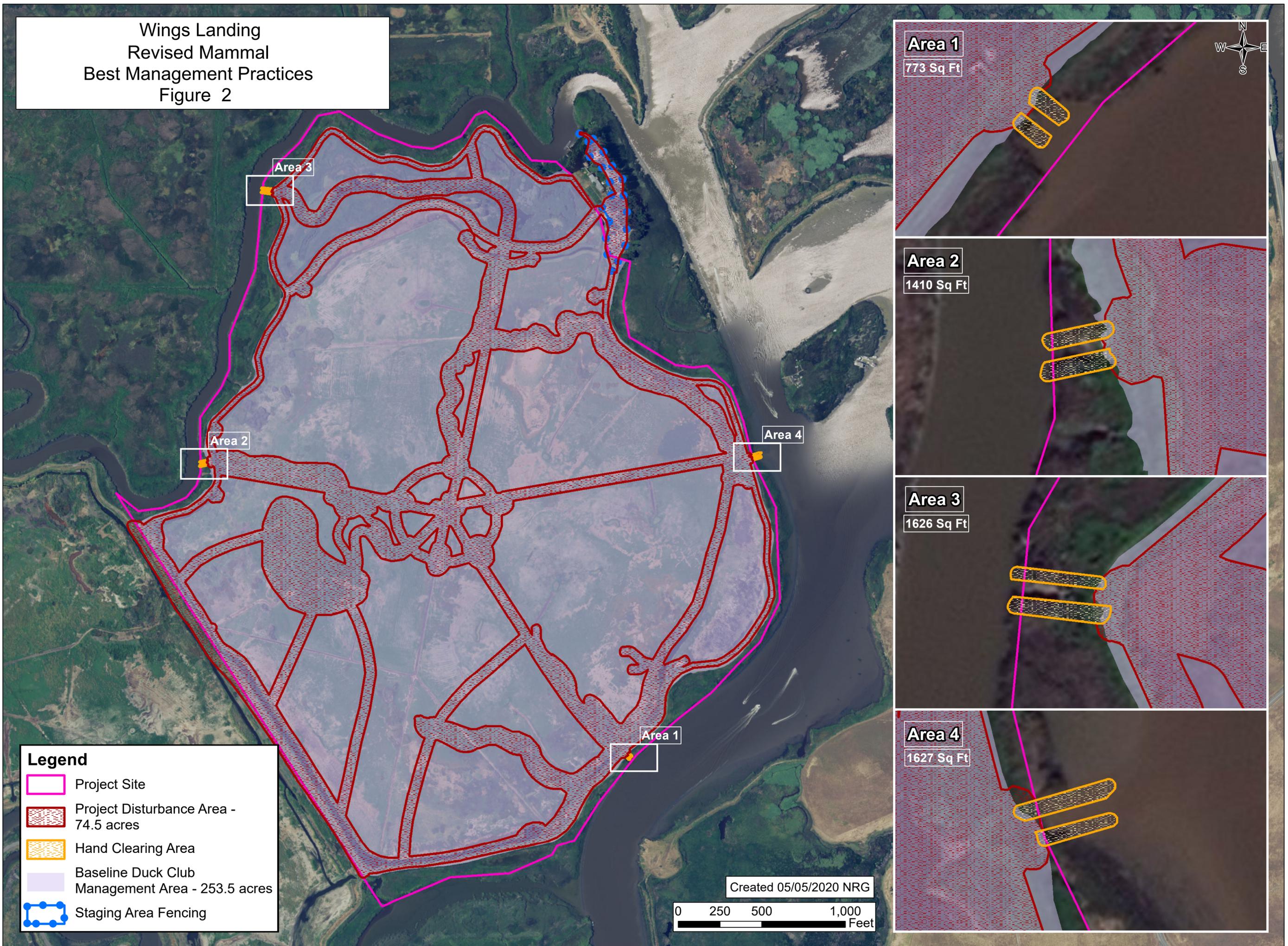
Legend

-  Project Site
-  Channel Plugs
-  Levee Breach
-  Structure Removal
-  Haul Route
-  Borrow-Ditch Restoration
-  Centered Channel Plug
-  Channel Created
-  Channel Enhanced
-  Cross Levee Improvement
-  Spoils Material
-  Tidal Depression

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 0 250 500 1,000 Feet



Wings Landing
Revised Mammal
Best Management Practices
Figure 2



Legend

-  Project Site
-  Project Disturbance Area - 74.5 acres
-  Hand Clearing Area
-  Baseline Duck Club Management Area - 253.5 acres
-  Staging Area Fencing

Created 05/05/2020 NRG

0 250 500 1,000
Feet

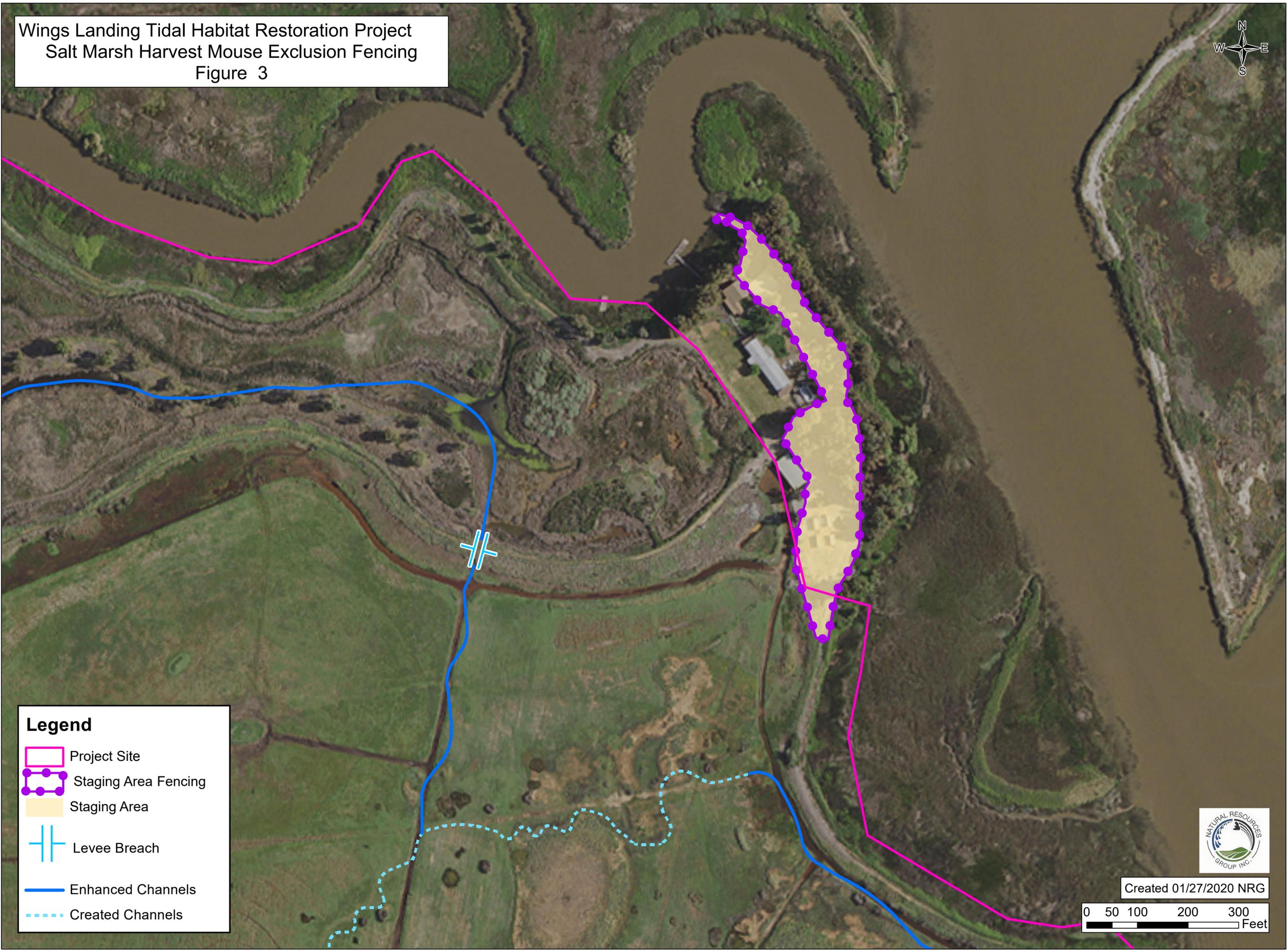
Area 1
773 Sq Ft

Area 2
1410 Sq Ft

Area 3
1626 Sq Ft

Area 4
1627 Sq Ft

Wings Landing Tidal Habitat Restoration Project
Salt Marsh Harvest Mouse Exclusion Fencing
Figure 3



Legend

-  Project Site
-  Staging Area Fencing
-  Staging Area
-  Levee Breach
-  Enhanced Channels
-  Created Channels



Created 01/27/2020 NRG

