APPENDIX B
SUPPLEMENTAL INFORMATION ON BLACK-CROWNED NIGHT HERON AND WIDGEON GRASS DISTRIBUTION

BERKELEY
CARLSBAD
FRESNO
IRVINE
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

February 28, 2017

Adam Wolff, AICP
Director, Planning and Building
Town of Corte Madera
300 Tamalpais Drive
Corte Madera, CA 94925

Subject: Supplemental Information on Black-crowned Night-heron and Widgeon Grass Distribution for the Recirculated Draft EIR for the Corte Madera Inn Rebuild

Dear Adam:

As requested the following provides additional information and analysis for the black-crowned night-heron (*Nycticorax nycticorax*) (BCNH) day roost at the Corte Madera Inn pond and the abundance of widgeon grass at the Burdell Ranch Wetland Mitigation Bank (Burdell Ranch) to help address the comments on the biology section of the Recirculated Draft EIR for the Corte Madera Inn (Inn) Rebuild Project. The term day roost is herein defined as a non-breeding roost site (i.e., not a rookery), typically used by BCNH in the non-breeding season.

BLACK-CROWNED NIGHT-HERON

LSA performed the following tasks:

- Conducted additional review of scientific literature;
- Conducted an additional field survey to search for other day roost sites; and
- Contacted Dr. John Kelly of the Audubon Canyon Ranch and Roger Hothem of the United States Geological Survey Dixon Field Station.

Literature Review and Personal Communications

Substantial research has been conducted on BCNH, but this research has primarily focused on breeding colonies and the effects of contaminants on BCNH. The following provides a summary of relevant information regarding non-breeding day roosts.

- Perlmutter, G.B. 1992. Environmental factors influencing roost arrival of Black-crowned Night-Herons. J. Field Ornithology 63:462-465.

  "These herons depend on finding particular roost-site conditions among multiple alternatives within their foraging range to facilitate annual and intraseasonal adjustments in roosting behavior. Such conditions include changes in temperature, wind, predation risk, disturbance, and increasing water levels associated with local flooding and sea level rise."

- Davis, William E. Jr., Roger L. Hothem, and Brianne E. Brussee. 2010. Black-crowned Night-Heron, *Nycticorax nycticorax.* Cornell Lab of Ornithology website for species account. https://birdsna.org/Species-Account/bna/species/bcnher/introduction.

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"In addition, its piscivorous feeding habits, flexibility in selection of nesting and foraging habitats, tolerance of degraded habitats, and ability to habituate to certain forms of disturbance (e.g., vehicular traffic) make the species particularly well-suited for service as a sentinel of environmental contamination in urban environments (Levengood et al. 2007)."

- Levengood, J.M., L. Wiedenmann, T.W. Custer, D.J. Schaeffer, C.W. Matson, M.J. Melancon, D.J. Hoffman, J.W. Scott, J.L. Talbott, J.O. Bordson, J.W. Bickham, B.A. Rattner, and N.H. Golden. 2007. Contaminant exposure and biomarker response in embryos of black-crowned night-herons (*Nycticorax nycticorax*) nesting near Lake Calumet, Illinois. Journal of Great Lakes Research 33:791-805.

  This reference focuses on contaminants.

- BirdLife International (2017) Species factsheet: *Nycticorax nycticorax*. http://www.birdlife.org.

  "The species's aggregatory behaviour [*sic*] outside of the breeding season varies much throughout its range, some populations (e.g. in America) remaining highly gregarious throughout the year (Snow and Perrins 1998) and gathering in flocks of hundreds or even thousands to roost (del Hoyo et al. 1992), others (e.g. Palearctic breeders) being largely solitary except when roosting or on migration (Snow and Perrins 1998) (roosting flocks of 2-6 to 200 are known in Africa (Brown et al. 1992) and small flocks occur on migration) (del Hoyo et al. 1992). The BCNH is largely crepuscular and nocturnal, but may feed diurnally especially during the breeding season (del Hoyo et al. 1992)."

  Note: Snow and Perrins 1998 and del Hoyo et al. 1992 were not reviewed. Both publications are handbooks (Birds of the Western Palearctic and Handbook of the Birds of the World. Vol. 1, respectively) and primarily report information from other sources.

- LSA contacted Dr. John Kelly of the Audubon Canyon Ranch (phone conversation 2/15/2017) and Roger Hothem (e-mail exchange 2/15/2017) of the United States Geological Survey Dixon Field Station. Both researchers have multiple years of experience with BCNH in the Bay Area and were inquired about their knowledge on non-breeding roost sites. These communications supported LSA's review of the scientific literature indicating that little information is available on non-breeding roosts of this species. Dr. Kelly did not have any other information on day roost locations for BCNH in Marin County.

Field Studies

Prior to conducting additional field surveys, we reviewed the California Natural Diversity Database (CNDDB) and Cornell Lab of Ornithology *eBird* data for BCNH (http://ebird.org/ebird/map) to review records to identify other potential day roost sites in the Corte Madera, Greenbrae, and Larkspur area.

There are 26 statewide records in the CNDDB for BCNH. All records (except for possibly one location record) describe nesting rookeries. The only CNDDB Marin County record for BCNH is for a large multi-species rookery on West Marin Island (EO Index 34408).

Other than general *eBird* checklist observations and notes provided for the day roost at the Corte Madera Inn, no other roost sites or potential roosts were identified in the Corte Madera, Greenbrae, and Larkspur area. Most *eBird* reports for observations that were not associated with the Corte Madera Inn site were simply checklists of species without notes and typically contained only a limited number of BCNH observations (usually 1 or 2 birds). Data on the numbers of BCNH at the Inn pond roost site were also obtained from the 2016 Southern Marin Christmas Bird Count as reported in the February 2017 edition of The Rail (the Newsletter of the Marin Audubon Society) Vol. 59, No. 06.

LSA biologist Eric Lichtwardt conducted a follow-up field survey of the Inn pond and surrounding areas on February 14, 2017 to acquire more information on BCNH in the area. During the survey, Mr. Lichtwardt counted 7-8 roosting BCNH in the trees at the Inn pond about 2:20 PM; the birds were concentrated in two red iron bark (*Eucalyptus sideroxylon*) trees on the western edge of the pond. Mr. Lichtwardt also searched for potential roosting trees in other accessible areas near the Inn pond. Areas searched included trees:

- along the High and Low Canals from approximately Hickory to the Larkspur Trail;
- the Larkspur Trail easterly to Highway 101;
- between Highway 101 and Shorebird Marsh south of Wornum Drive;
- the slough east of Shorebird Marsh about 1,340 feet east of the pond; and

He did not locate any other BCNH day roosts, but not all potential day roost sites (e.g., densely foliaged trees) were observable from public rights-of-way.

Assessment

Our review of pertinent literature and our professional experience and observations indicate the BCNH is flexible in its non-breeding season roosting behavior and roosts in a variety of native and non-native ornamental trees and shrubs and has the ability to move between day roost sites. This species also forages in a broad range of fresh, brackish, and salt-water habitats, from rivers, lakes, small ponds, and swamps to lagoons, mudflats, saltmarsh, and tidal sloughs; a diversity of such foraging habitats are available in the Corte Madera area. BCNH prefer trees and/or shrubs with dense canopy cover generally near foraging areas for day roosts. Day roosts can be located in areas that are not adjacent to water, which can include ornamental trees in urbanized settings such as the downtown area of Point Richmond, where up to 20 or more BCNH are known to roost in street trees (LSA personal observation).

The use of a given day roost site and the number of BCNH using a given site also appear to "fluctuate among multiple alternatives within their foraging range to facilitate annual and intersessional adjustments in roosting behavior" as noted by Perlmutter (1992). During the Southern Marin Christmas Bird Count on December 31, 2016, observers counted 35 BCNH roosting in the trees at the Inn. As noted above, Mr. Lichtwardt counted 7-8 roosting BCNH on February 14, 2017.

BCNH on day roosts are also tolerant of degraded habitats and have the ability to habituate anthropogenic disturbances such as vehicular traffic (Davis et al. 2010) and high levels of human activity. One documented day roost we are familiar with in an urban environment that exhibits these characteristics is the roost in Chinese elms (*Ulmus parvifolia*) along Washington Avenue and Park Place near LSA's office in Point Richmond.

Similar to the BCNH day roost at the Inn, the numbers of birds at the Point Richmond day roost varies considerably over the non-breeding season. Typically, the largest numbers of BCNH are present during the early part of the non-breeding season when the trees have an abundance of leaves. For example, 16 BCNH were observed in the trees on January 4, 2017 (Cornell Laboratory of Ornithology *eBird* data), one was seen during the week of January 23, and none were seen on February 2, 2017 after a winter storm had removed most of the old leaves on the elms (E. Lichtwardt, pers. obs.). The removal of the leaves by the storm winds likely made the elms less attractive to the herons as a roost site. More recently and possibly associated with milder weather this week, BCNH were again roosting in the elm trees. LSA staff observed 10 and 6 BCNH on February 27 and 28, respectively.

Even when BCNH are not roosting in the elms BCNH are routinely observed at dusk flying from the downtown area of Point Richmond to the San Francisco Bay shore (E. Lichtwardt, pers. obs.). No BCNH were present in the elms on February 13, 2017, but at least six were observed and others heard vocalizing that evening as they flew from unknown roost sites in Point Richmond toward the shoreline to the west. Exactly where the herons are roosting when not in the elms is not clear, because many potential roost trees in the area have dense foliage and are not accessible for surveys.

Conclusion

There is little information in the literature on BCNH day roosts; much remains to be learned about the physical characteristics of suitable day roost sites, the movement patterns of BCNH between roosts, the factors that affect roost site selection and movement between day roost sites, and the effects of loss or alteration of such roosts. Based on the number of birds observed at the Inn pond roost, this site is attractive to local BCNH. However, it is unclear whether the presence of the pond itself is an important factor. Given the presence of other significant BCNH day roosts in other areas that are in proximity to, but not necessarily adjacent to, water suggests that the structure of the trees are more important than adjacency to the pond.

The numbers roosting at any given time at the Inn day roost appears to fluctuate. This daily fluctuation suggests that individuals are roosting in other nearby suitable sites when not present at the Inn. This pattern is also apparent at other day roosts such as in Point Richmond.

Given the limited available information on day roosts, it is difficult to evaluate the local importance of the Inn roost, both to individual birds that currently use the trees and to the larger population in the east Marin area. This species is opportunistic in its ability to use roost trees that are non-native and located in highly urbanized areas, often in close proximity to vehicle and pedestrian traffic. BCNH exhibit flexible behavior, including an ability to move between day roost sites. This all suggests that if the trees and pond are removed the BCNH will likely relocate to alternative roosts.

This could include day roosts currently used by individual BCNH when they are not using the Inn roost, or they may establish new day roost sites.

We agree with the comments on the DEIR that the roost site is important to the local BCNH population and that its loss is an adverse effect of the proposed project. However, we also concur with the DEIR conclusion that this impact does not constitute a significant impact under CEQA based on the applicable significance criteria described in Section 4.3 of the DEIR:

- BCNH is a common and widespread species. It is not listed as threatened or endangered or as a species of special concern by the California Department of Fish and Wildlife (CDFW) or related federal designations. The ICUN Red List category for BCNH is "Least Concern;"
- The loss of the roost site will not interfere substantially with the movement of BCNH in the local or east Marin area nor significantly affect an established movement corridor;
- The roost is a non-breeding season use area and as such does not constitute a nursery site under CEQA Guidelines; and
- The Town does not have any local policies or ordinances protecting habitat features or uses such as the day roost.

Several commenters addressed the potential for significant cumulative impacts from the loss of the roost site. These comments have noted a reported apparent decline in the BCNH population in the region over the last decade and loss of the roost could be cumulatively significant even if the loss of the Inn roost site isn't individually significant. While a combination of known and unknown factors are likely contributing, the primary causes suggested for the decline are increasing rates of nest failure resulting from predation or other types of disturbance to nesting colonies (Condeso 2013). For example, Hothem et al. (2007) reported that during the 2007 breeding season at the Alcatraz rookery (one of the major BCNH rookeries in the Central San Francisco Bay region), eggs in 40 percent of BCNH nests were destroyed by predators (gulls, and ravens) before hatching. Condeso (2013) notes that brood sizes in successful nests show no evidence of decline and that food supply and foraging habitat quality seem to consistently support normal broods.

Given the likelihood that nest predation and resulting low recruitment is the primary cause of the regional BCNH population decline, our opinion is the loss of the non-breeding winter roost at the Inn is unlikely to significantly contribute to cumulative long-term regional BCNH population decline.

WIDGEON GRASS

Unfortunately, we were not able to conduct additional field work to quantify the extent of widgeon grass at the Burdell Ranch. A levee along the Petaluma River at the ranch was breached during high tides on February 4, 2017. While we understand the breach has been repaired, we were unable to access the area because of ongoing safety concerns. This time of year is also not optimum for identifying widgeon grass presence. As we observed at the Inn pond on February 14, 2017, the extent of widgeon grass in the pond was substantially reduced from our observations last July.

In order to provide some quantification of widgeon grass on Burdell Ranch, we used the map of widgeon grass on the Burdell Ranch presented in the June 30, 2016 Zentner and Zentner memo. We have also attached two photographs provided by the applicant (dated May 9, 2016) showing dense mats of widgeon grass in two waterways on the Burdell Ranch (note the photograph locations were plotted and verified using the photograph properties data).

Using the two classifications (contains widgeon grass and presumed to contain widgeon grass) on the Zentner and Zentner map, we prepared maps using Esri Google Maps Satellite imagery (03/15) to delineate just the open water habitat within the old sloughs and ditches (Figure 1, attached). Based on this analysis we estimated 15.1 acres of potentially suitable widgeon grass habitat composed of the following:

- 7.5 acres in areas classified as "supporting widgeon grass" and
- 7.6 acres in areas classified as "presumed to support widgeon grass."

While we could not directly verify the information provided by Zentner and Zentner, the presented distribution information is consistent with LSA staff's observations since the mid-1980s of widgeon grass being abundant in most of the old sloughs and ditches on the Burdell Ranch. The two photographs showing dense mats of widgeon grass are also consistent with our previous observations at the Burdell Ranch.

As discussed in our September 2016 letter, the wetland mitigation credits purchased by the applicant at the Burdell Ranch are of a different habitat type than the pond – seasonal wetlands rather than a perennial pond supporting widgeon grass and open water. These created seasonal wetlands do not have an appropriate hydrological regime to support widgeon grass. However, we estimate that approximately 15 acres of similar historical tidal channels (similar conditions to the pond) and ditches with appropriate hydrology on the Burdell Ranch support widgeon grass and open water habitats. While these channels and ditches were not designated as specific "credit categories," they were none-the-less preserved as part of the agreement establishing the Burdell Ranch Mitigation Bank. The Burdell Ranch channels and ditches have a similar historical context to the conditions associated with the Inn pond in that they are former tidal habitats and the hydrology is currently artificially managed. The preserved channel habitat at Burdell Ranch, however, represents a higher quality example of the widgeon grass natural community than that found at the Inn pond and has higher habitat value because of the larger expanse of contiguous preserved wetland and upland habitats which are managed by CDFW to promote habitat values.

The preservation of existing habitat is an accepted and recognized form of mitigation for impacts to wetlands as well as threatened and endangered species and sensitive natural communities. While the preservation and management of these other "non-credit" widgeon-grass habitats was not a direct "credit category" at Burdell Ranch, the transfer of these habitats to the CDFW for ownership and management was an interdependent result of the purchase of the wetland mitigation credits by the project applicant.

Since widgeon grass habitat is not a direct credit category for the Burdell Ranch, it is necessary to determine if this habitat has been used for other mitigation purposes (e.g., the potential double

crediting of widgeon grass mitigation). We contacted Anthony Georges, the bank manager, to see if any other projects that have purchased credits at Burdell Ranch included a request for credit or acknowledgement of widgeon grass habitat for mitigation purposes. Mr. Georges, who has been involved since the inception of Burdell Ranch, indicated that no other bank customers inquired about widgeon grass or claimed widgeon grass habitat mitigation from using purchased Burdell Ranch credits. Given that the bank credits are largely sold out, the potential for double crediting mitigation is minimal.

While we are confident based on our past work on Burdell Ranch that widgeon grass is widespread and abundant, we recommend the following additional condition should the Town approve widgeon grass mitigation at Burdell Ranch as part of approval for the Corte Madera Inn project if we are not able to verify this information prior to a decision:

- The extent of widgeon grass on Burdell Ranch should be documented by an independent qualified biologist paid for by the applicant but selected by the Town to confirm the presence of appropriate mitigation acreage before any grading permits to fill the Inn pond are issued by the Town. This should include a field inspection during the appropriate time of year to allow for detection of widgeon grass on the channels and ditches where this species has been reported or is presumed to be present. A report of findings should be prepared by the qualified biologist providing a refined acreage of the extent of widgeon grass habitat at Burdell Ranch.

With this additional verification of the presence of widgeon grass habitat preserved at Burdell Ranch as provided under the above recommendation, we concur with the conclusion described under Impact BIO-6 in Section 4.3 of the REIR No. 2 that implementation of Mitigation Measure BIO-3a would serve to mitigate the potentially significant impact of eliminating the low-quality widgeon-grass sensitive natural community associated with the Inn pond.

Sincerely,

LSA Associates, Inc.

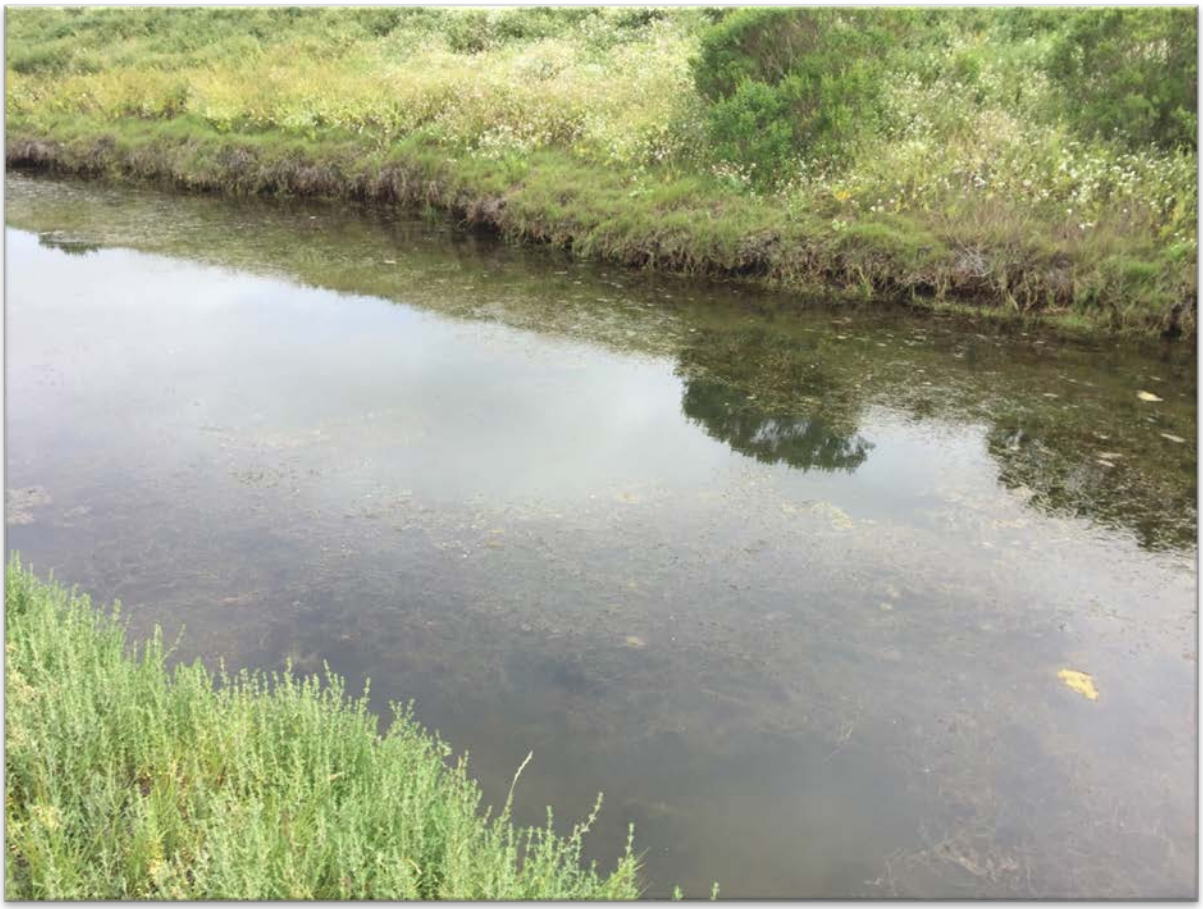
Eric Lichtwardt
Associate

Steve Foreman
Principal

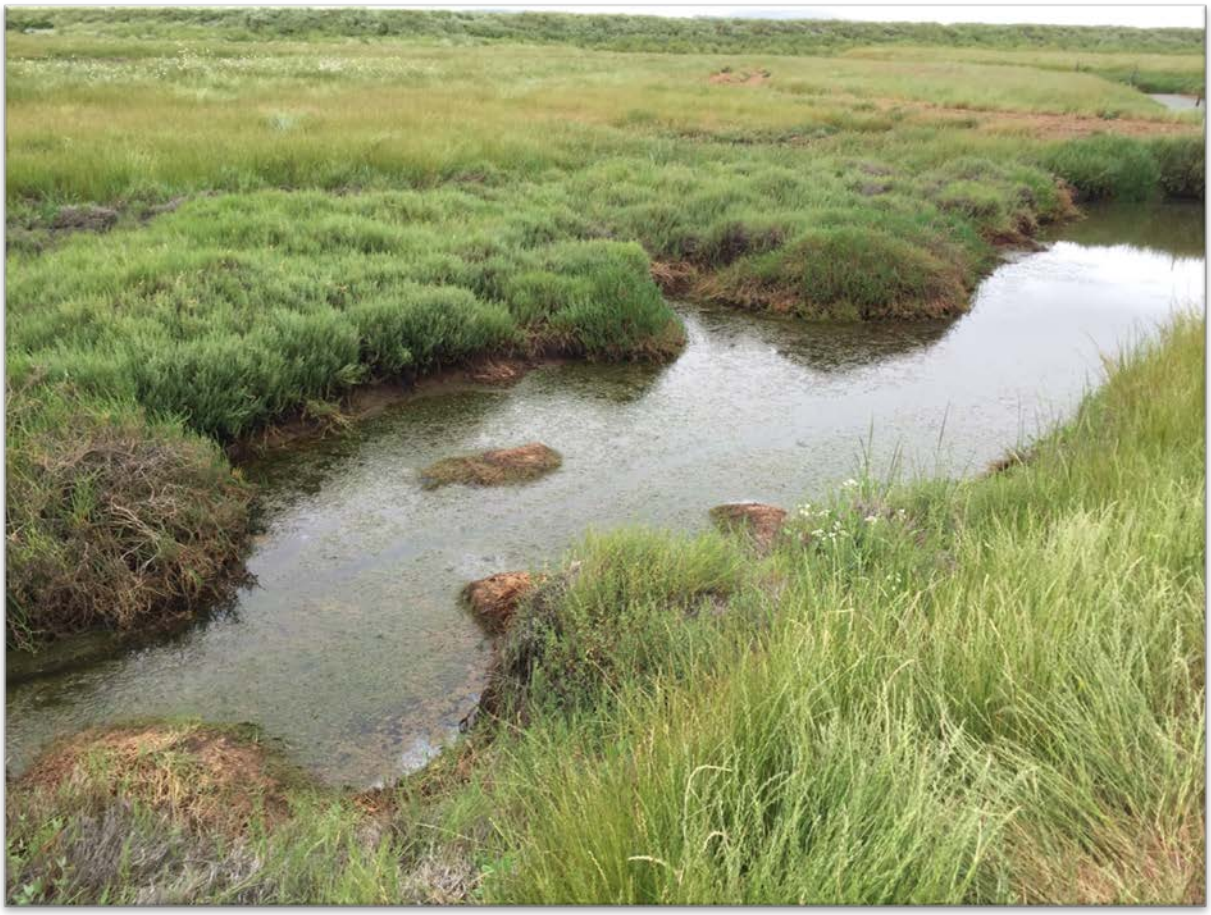
LITERATURE CITED

Condeso, Emily. 2013. The status of Black-crowned Night-herons in the northern San Francisco Bay area. Like on the Edge. The Ardeid. Audubon Canyon Ranch. Stinson Beach, CA. Pages 4-5.

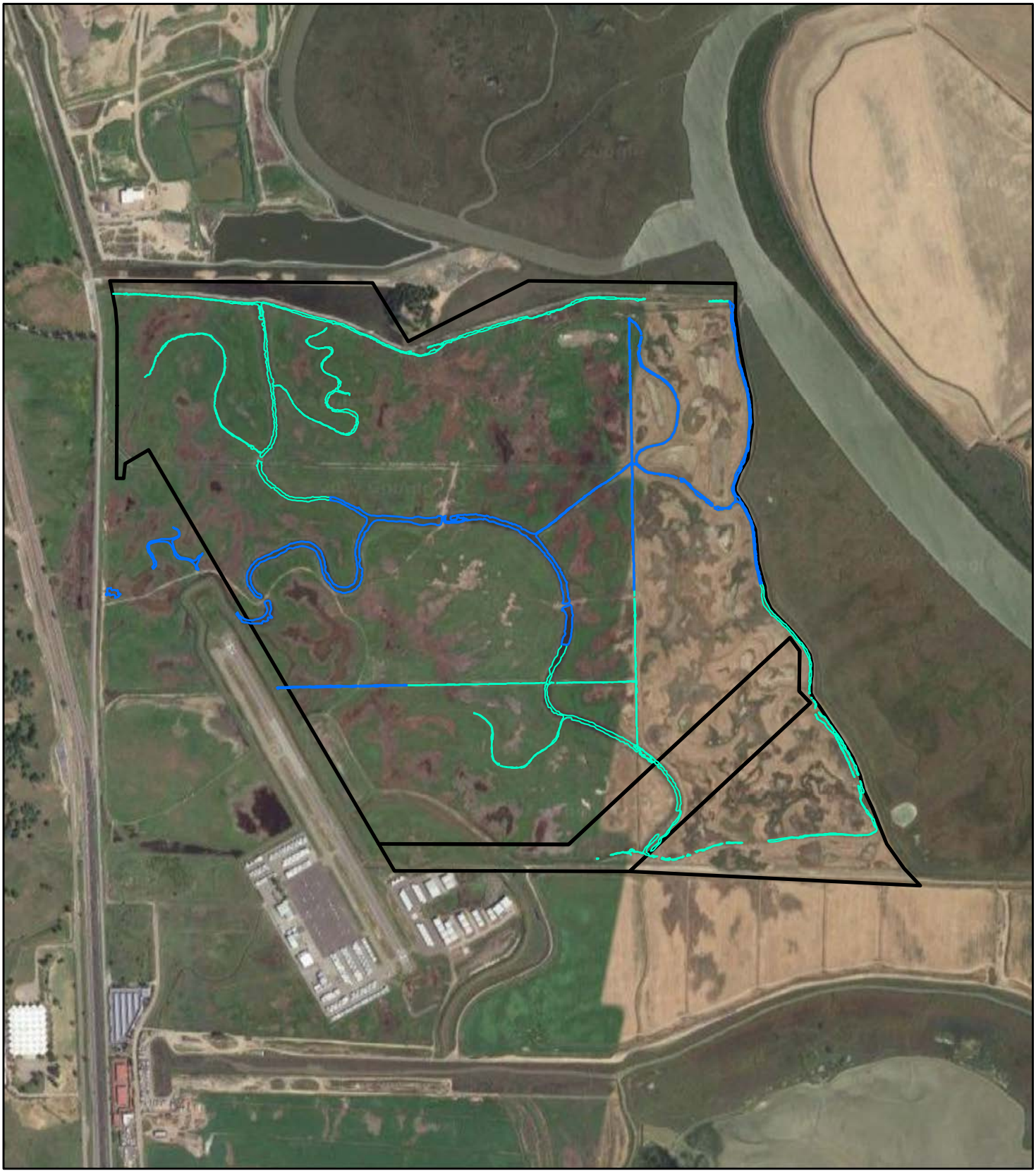
Hothem, Roger, Darrin R. Bergen, and Christian Hellwig. 2007. Reproductive Success of Black-crowned Night-Herons and Snowy Egrets at Alcatraz Island, San Francisco Bay, California: 2007. Administrative Report. Prepared for Golden Gate National Recreation Area, National Park Service. U.S. Department of The Interior, U.S. Geological Survey, Western Ecological Research Center.



Photograph 1
Widgeon grass in eastern levee borrow ditch at Burdell Ranch. Location: Longitude 38:9:18.890, Latitude 122:32:38.340. Photograph date May 9, 2016.



Photograph 2
Widgeon grass in historical channel at Burdell Ranch. Location: Longitude 38:9:4.799, Latitude 122:32:41.440. Photograph date May 9, 2016.



LSA

Project Parcels

Channels

Contains Widgeon Grass (8.1 ac.)

Presumed to Contain Widgeon Grass (7.6 ac.)

FIGURE 999

N

0 625 1250

FEET

Corte Madera Inn
Marin County, California

Channels Containing Widgeon Grass

SOURCE: Zentner Widgeon Grass Anlysis (07/16); Esri Google Maps Satellite (03/15)

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