H. T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS

UPPER HESS CREEK
HABITAT RESTORATION PROJECT
BIOLOGICAL AS-BUILT REPORT

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Regional Water Quality Control Board Site No. 02-01-C117

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PROJECT OVERVIEW AND SUMMARY OF BIOLOGICAL AS-BUILT CONDITIONS

The Upper Hess Creek Habitat Restoration Project is located on an approximately 200-acre (ac) portion of the 496-acre Upper Hess Creek Watershed property located on the north side of Kirker Pass Road, west of the City of Pittsburg, and east of the City of Concord in Contra Costa County (Figure 1).

Restoration at the project site was designed to support the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan's biological goals and objectives for wetland and creek channel habitat (HCP/NCCP: Jones & Stokes 2006). The Upper Hess Creek Restoration Mitigation and Monitoring Plan (MMP) describes the HCP/NCCP's project related goals as well as site specific restoration objectives, which will be used to evaluate the success of the restoration (H. T. Harvey & Associates 2011a). For reference, these goals and objectives have been included in Appendix A.

Site specific goals for the Upper Hess Creek Habitat Restoration Project (Upper Hess) included the restoration and creation of target habitats. To accomplish these goals, the MMP design proposed habitat restoration work at five individual project areas: the California tiger salamander (CTS) Pond, Upper Stock Pond, Channel Restoration Area, Main Stock Pond, and Alluvial Valley (Figure 2). The proposed target habitats included in the MMP are presented in Table 1. In addition to the habitat restoration work at the five project areas, the proposed work involved clay harvest at the Clay Borrow Area, placement of excess fill at the Excess Fill Placement Area, and grading of a new ranch road crossing at the Ranch Road Crossing. The design also proposed improving existing sensitive habitats by the control of non-native, invasive plant species and removal of ranch debris.

Table 1. Comparison of Proposed (P) and Installed (I) Target Habitats at Upper Hess

RESTORATION SITE NAME	ALKALI WETLANDS (AC)		OTHER WATERS (AC)		BREEDING POND WETTED (AC)		CHANNEL RESTORATION (LINEAR FEET)	
	P	I[1]	P	I[1]	P	I[1]	P	I[1]
CTS Breeding Pond			0.005	0.005	0.12	0.06[2]	114	109
Upper Stock Pond			0.001	0.000[3]			258	0[3]
Channel Restoration Area	0.05	0.05					117	117
Main Stock Pond	0.10	0.08	0.002	0.002				
Alluvial Valley	2.32	2.16						
Total	**2.47**	**2.29**	**0.009[4]**	**0.007**	**0.12**	**0.06**	**489**	**226**

[1] Based on preliminary field observations. The final acreages will be confirmed as part of the long-term monitoring.
[2] Recommended repairs will likely increase the acreage of the CTS Pond.
[3] As described in the Results Section, construction at the Upper Stock Pond was not initiated.
[4] Due to rounding to the thousandth place, the total value is larger than the sum of the individual sites.

All grading and revegetation seeding work at Upper Hess was completed by 31 October 2011, and all work included in the site installation and debris removal was completed by 18 January 2012. A summary of the completed habitat restoration work at Upper Hess is detailed above in Table 1. All work was monitored and inspected daily by a representative from the East Bay Regional Park District (EBRPD) and periodically by East Contra Costa County Habitat Conservancy (ECCCHC) staff and a monitoring biologist from H. T. Harvey & Associates (HTH). As part of the permit conditions, a qualified biologist contracted by the East Contra ECCCHC conducted pre-work wildlife surveys and regular inspections of sensitive habitat areas. Overall, the restoration sites were generally constructed in accordance with the MMP.

With the completion of restoration site construction, the monitoring period has commenced. Monitoring will be conducted according to the methods and monitoring schedule outlined in the MMP for a minimum of 5 years. Monitoring results will be compared to established performance and success criteria. Annual monitoring reports will be submitted to the Regional Water Quality Control Board (RWQCB), California Department of Fish & Game (CDFG), and U.S. Army Corps of Engineers (USACE) by December 31st of each monitoring year.

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Figure 1: Vicinity Map
Upper Hess Creek Habitat Restoration Biological As-built Report
February 2012

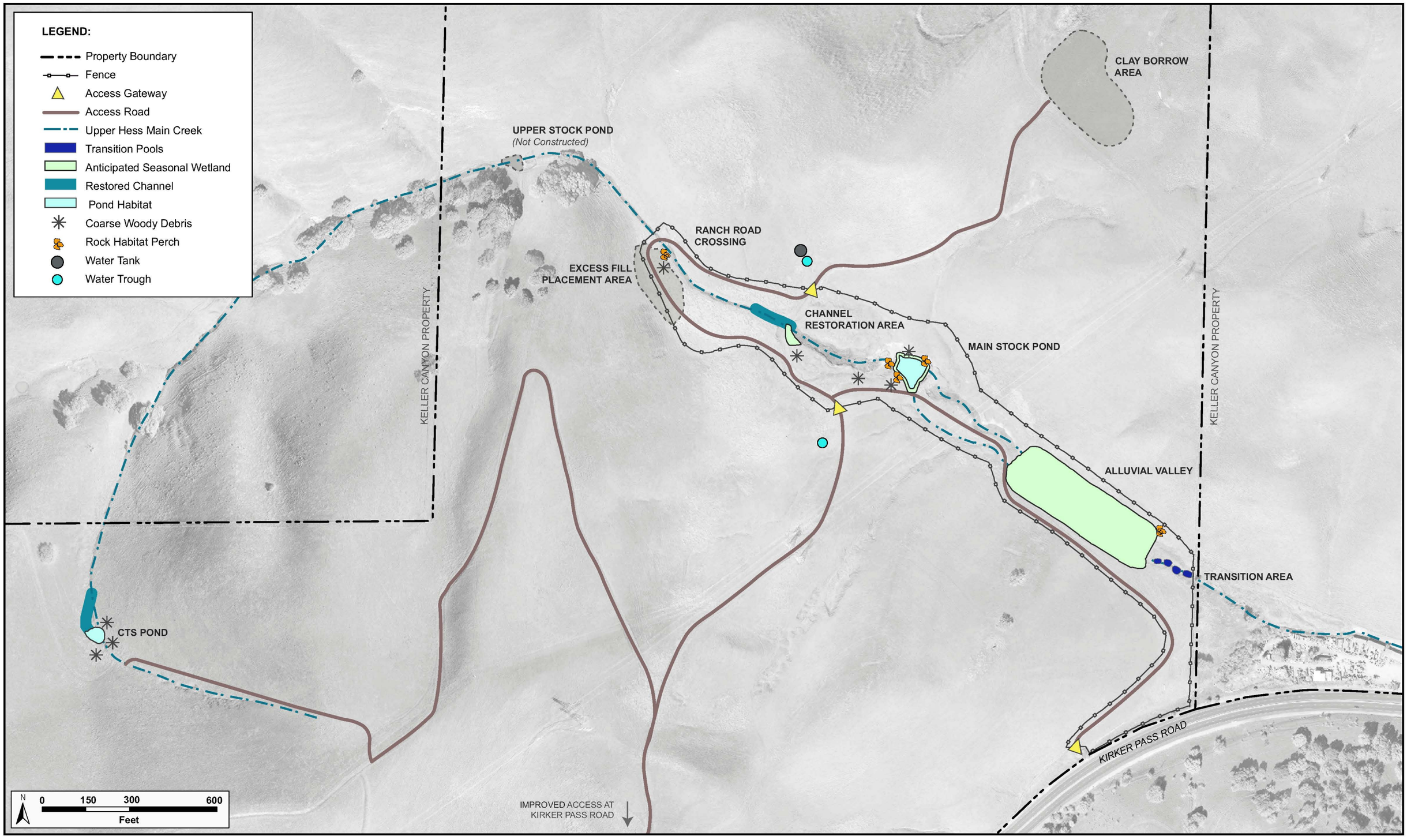

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Figure 2: Site Overview Map

Upper Hess Creek Habitat Restoration Biological As-built Report (2927-05)

February 2012

METHODS

The Biological As-Built Report provides a description of the biological conditions of the restoration site immediately following installation relative to the original design documents submitted to the regulatory permitting agencies. The only intent of the Biological As-Built Report is to document substantive deviations from the permitted design for regulatory agency consideration.

This Biological As-Built Report is based on observations made during construction monitoring and on information gathered from the field notes, photographs, and final site inspections that were conducted by EBRPD and HTH monitoring biologists and landscape architects throughout construction. All data for this report were collected during and immediately following construction. This report documents how and when the restoration components at Upper Hess were constructed, and details significant deviations from the biological intent of MMP.

CONSTRUCTION MONITORING

Daily construction monitoring was conducted by EBRPD staff and all sensitive habitats were closely inspected by a qualified biologist contracted by the ECCCHC. Monitoring staff from H. T. Harvey & Associates were on-site periodically throughout the construction process, and coordinated closely with the EBPRD staff and contractors to verify that the design was installed according to the biological intent of the MMP. Photographs documenting construction implementation were taken on a routine basis. A selection of installation photographs is presented in Appendix B.

GPS DATA COLLECTION

In January 2012 a biologist from H. T. Harvey & Associates mapped the maximum water surface elevation of the CTS pond and the anticipated habitat restoration area of the Channel Restoration Area, Alluvial Valley, and Main Stock Pond using a Trimble® Global Positioning System (GPS) unit with sub-meter accuracy. The data were downloaded and the acreages of the pond and restoration areas were then calculated.

PHOTO-DOCUMENTATION

Permanent photo-documentation points were established at the site prior to the start of construction in July 2011. Photos were taken at the time photo-documentation points were established, as well as following the completion of all construction (Appendix C).

RESULTS

The Upper Hess Creek Habitat Restoration Project meets the intent of the biological restoration goals outlined in the MMP. Habitat construction work at Upper Hess resulted in the anticipated creation of 2.29 ac of wetland habitat and 0.06 ac of CTS breeding habitat, as well as restoration of 226 linear feet of channel and 0.007 ac of Other Waters (Table 1 and Figure 2). Definitive acreages for the wetland and CTS breeding habitats are not provided in this biological as-built report, as the habitats will develop over time and actual acreages will be confirmed as part of the required USACE wetland delineation to be completed in Year-5. All work will be monitored and adaptively managed (based on recommendations provided in the annual monitoring reports) to maximize habitat development and ensure the long-term success of the restoration components.

The restoration components at the Upper Hess project sites were generally constructed in accordance with the MMP and the project plans and specifications (H. T. Harvey and Associates 2011b). Some modifications were required to adapt to site conditions at the time of construction. Construction deviations and design modifications are described in more detail below.

GRADING

Rough grading of the site began in August 2011 and was completed in October 2011. All excavation and grading work was completed by Grade Tech Inc., and in general conformed with the intent of the MMP. All excess fill was placed within the Excess Fill Placement Area and all clay used for wetland and CTS breeding pond habitat originated from the Clay Borrow Area (Figure 2). The grading activities and any deviations from design are described below for each habitat area.

- **CTS Pond.** Grading activities involved salvaging and stockpiling the top 6 inches of topsoil, placing 18 inches of imported clay within the pond and spillway footprint, and reapplying topsoil to meet the final design grades. Approximately 109 linear feet of channel and 0.005 ac of Other Waters were restored; however the pond was constructed smaller and with a lower dam face than designed. On 11 January 2012 the maximum water surface elevation was measured using a laser level, marked in the field, and then mapped using a GPS unit. Data from the post-constructed condition of the CTS Pond indicate a ponding area of 0.06 ac (design provided for 0.12 ac). In addition, elevation data taken at that time showed that the berm/dam face did not provide any free-board, and that the spillpoint was located too close to the berm/dam face and not centered in the spillway. We recommend repairs to correct the height of the berm/dam and the spillpoint to comply with design specifications. Any repairs will be documented in the annual monitoring reports.

- **Upper Stock Pond.** Construction at the Upper Stock Pond was never initiated due to two unexpected factors: 1) prolonged ponding and 2) presence of common and special status amphibian species. The omission of this site for construction accounts for the project-wide reduction of linear footage of channel restoration and acreage of restored Other Waters.

- **Channel Restoration Area.** Grading activities at the Channel Restoration Area involved salvaging and stockpiling the top 6 inches of topsoil, excavating to meet design grades, placing rock for grade control within the channel, and reapplying topsoil to meet the final design grade. The restored channel was constructed as designed and meets the intent of the MMP. Approximately 117 linear feet of channel were restored and an anticipated 0.05 ac of alkali wetland was created. The final acreage of alkali wetland will be determined during the Year-5 USACE wetland delineation.

- **Main Stock Pond.** Grading activities at the Main Stock Pond involved salvaging and stockpiling the top 6 inches of topsoil, removing excess debris and old fill stockpiles, excavating to meet design grades, removing the existing outlet pipe, placing interlocking concrete block at the new pond spillway, and reapplying topsoil to meet the final design grade. The stabilized outlet/spillway, the pond enhancements (including the removal of debris and fill), and the broadly graded bench for anticipated wetland at the Main Stock Pond were generally constructed as designed and meet the intent of the MMP. Construction work at the Main Stock Pond resulted in the creation of an anticipated 0.08 ac of alkali wetland and approximately 0.002 ac of Other Waters. The final acreage of alkali wetland will be determined during the Year-5 USACE wetland delineation.

- **Alluvial Valley.** Grading activities involved salvaging and stockpiling the top 18 inches of topsoil and approximately 12 inches of subsoil, placing 18 inches of imported clay from the Clay Borrow Area, installing subterranean clay risers (i.e. cut-off walls) across the valley floor, placing alluvium salvaged subsoil and topsoil to meet finish grade, and grading micro-topography to add habitat complexity. At the upstream transition into the Alluvial Valley, field conditions required depths of excavation (along a 10 ft wide band) to extend to approximately 10 ft to capture a visually apparent water horizon. To allow for a gentle enough transition from this increased depth, the first clay riser (moving downstream) was not constructed. The downstream end of the valley was graded and constructed as described in the MMP to provide a stabilized step-pool transition before the property boundary. Construction work at the Alluvial Valley resulted in the creation of an anticipated 2.16 ac of alkali wetland, with the final acreage to be determined during the Year-5 USACE wetland delineation.

SITE INSTALLATION AND DEBRIS REMOVAL

Installation of cattle exclusion fencing, gateways, coarse woody debris, frog habitat perches, and general debris removal was completed by 30 November 2011. The corrugated metal pipe and wooden spring boxes above the Main Stock Pond were removed and filled by 18 January 2012 by Restoration Resources. The cattle exclusion fencing and gateways were installed by Central Fencing and all remaining installation work and general site cleanup was completed by Grade Tech, Inc. Installation and debris removal conformed to the intent of the MMP and generally follow the design specifications. The approximate locations of site features are shown on Figure 2.

SEEDING

After completion of finish grading and installation of the habitat features (e.g. coarse woody debris and frog habitat perches) all disturbed areas were seeded and covered with straw. Seeding work was completed by 31 October 2011 by Mark Seeding Services. The application and rates of seed conformed to the method and rates stated in the MMP (Tables 2 and 3).

Table 2. Native Transition Seed Mix

SCIENTIFIC NAME	COMMON NAME	POUNDS OF PURE LIVE SEED/ACRE
Achillea millefolium	yarrow	1
Bromus carinatus	California brome	12
Elymus glaucus	blue wild rye	12
Hordeum brachyantherum var. *Salt*	meadow barley	6
Nassella pulchra	purple needlegrass	6
Vulpia microstachys	small fescue / three-weeks fescue	10
	TOTAL	**47**

Table 3. Wetland Seed Mix

SCIENTIFIC NAME	COMMON NAME	POUNDS OF PURE LIVE SEED/ACRE
Elymus glaucus	blue wild rye	1
Festuca rubra	molate red fescue	12
Hordeum brachyantherum var. *Salt*	meadow barley	12
Hordeum depressum	dwarf barley	6
Vulpia microstachys	small fescue / three-weeks fescue	6
	TOTAL	**56**

PHOTO-DOCUMENTATION

Permanent photo-documentation points were established at the site prior to construction. After completion of construction, all photos (with the exception of points 4, 5 and 6 which were not taken because the Upper Stock Pond was not constructed) were retaken from the established photos points on 10 January 2012. Locations of the photo-documentation points and photos are presented in Appendix C.

CONCLUSION

As described in this report, the Upper Hess Creek Habitat Restoration Project was generally constructed in accordance with the intent of the MMP. The majority of the design deviations that occurred were the result of field fitting and modifications designed to improve the project's restoration potential and the site's overall habitat value. However, we recommend repairs be undertaken at the CTS Pond to increase the height of the dam face (providing a minimum of 12-18 inches of freeboard) and to repair the spillway to center the spillpoint.

With the completion of restoration site construction, the monitoring period will now commence. Monitoring will be conducted according to the monitoring methods and monitoring schedule outlined in the MMP. Monitoring will occur for a minimum period of 5 years. Annual monitoring reports will be submitted to the RWQCB, CDFG, and USACE by December 31st of each monitoring year.

LITERATURE CITED

Jones & Stokes. 2006. East Contra Costa County Habitat Conservation Plan and Natural Community Conservation Plan. October. (J&S 01478.01.) San Jose, CA.

H. T. Harvey & Associates. 2011a. Upper Hess Creek Restoration Mitigation and Monitoring Plan. Dated 20 May 2011. Project Number 2927-05.

H. T. Harvey & Associates. 2011b. Upper Hess Creek Restoration Project Technical Specifications and Plans. Dated 23 May 2011. Project Number 2927-05.

APPENDIX A.
RESTORATION GOALS AND OBJECTIVES
EXTRACTED FROM THE MMP

RESTORATION GOALS AND OBJECTIVES

The following description and table detailing the restoration goals and objectives for the Upper Hess Creek Habitat Restoration Project were developed in the project's MMP and copied below for reference (H. T. Harvey & Associates 2011a).

> The restoration goals and objectives for the project area are based upon the biological goals and objectives established for the HCP/NCCP Biological goals and objectives relevant to restoration on the UHCW site are provided in Table A-1 below. Table A-1 also defines the site-specific restoration objectives for the UHCW site, based upon each relevant HCP/NCCP objective. The HCP/NCCP objectives describe the desired outcome for the HCP/NCCP as a whole, whereas the site-specific restoration objectives describe the desired restoration outcome for the UHCW site. Table A-1also lists the Covered Species that may be benefited, and restoration measures that will be implemented to achieve each of the site-specific restoration objectives. Performance criteria for each of these objectives are described in the Monitoring section of the MMP.

Table A-1. HCP/NCCP Biological Goals and Objectives, Site-specific Restoration Objectives and Site-specific Restoration Measures

HCP/NCCP Goals and Objectives	UHCW Site-specific Restoration Objectives	Covered Species Benefited	Site-specific Restoration Measures
Wetlands (and Other Aquatic) Biological Goals and Objectives			
Goal 2: Maintain and enhance hydrogeomorphic and ecological function of wetlands and ponds to promote covered species, native biological diversity, and habitat heterogeneity.			
Objective 2.1. Maintain or increase native emergent vegetation where appropriate.	SO-1. Increase the abundance and distribution of native wetland vegetation in the project area.	California tiger salamander, California red-legged frog	Create and restore wetlands onsite. Establish native wetland vegetation where appropriate in created and restored wetlands and drainages.
Objective 2.2. Reduce sediment deposition and transport where appropriate.	SO-2. Reduce erosion along the tributary to Hess/Kirker Creek.	California red-legged frog	Increase onsite water retention, create stable vernal alkali wetland complex, reduce grazing within wetlands.
Objective 2.3. Maintain or increase wetland and pond capacity and water duration as appropriate.	SO-3. Increase wetland and pond capacity and water duration in the project area.	California tiger salamander, California red-legged frog	Construct California tiger salamander breeding pond, create stable alkali wetland complex.

HCP/NCCP Goals and Objectives	UHCW Site-specific Restoration Objectives	Covered Species Benefited	Site-specific Restoration Measures
Objective 2.4. Maintain or increase flows to and connectivity among wetlands and wetland complexes as appropriate.	SO-4. Hydrologically connect Upper Hess Creek from the main stock pond to channel at property boundary.	California red-legged frog	Connect the lower stock pond outflows to channel at property boundary via the proposed alluvial valley alkali wetland restoration.
Objective 2.6. Eliminate or reduce exotic plants.	SO-5. Reduce non-native plant species in the project area wetlands.	6 covered plant species with potential to occur on site and golden eagle and burrowing owl (foraging habitat improvements).	Vegetate newly restored areas with native species and implement invasive plant control measures.
Goal 3: Restore wetlands and create ponds in Preserve System to compensate for permanent loss of these habitats.			
Objective 3.2. Restore alkali wetlands in-kind at a ratio of 2:1 of wetted ac (estimated to be 64 ac of alkali wetland complex with the maximum urban development area).	SO-6. Restore approximately 2.32 ac of alkali wetlands in the project area.	California red-legged frog	Create alkali wetland complex on site.
Objective 3.4. Create ponds in-kind at a ratio of 1:1 (estimated to be 8 ac with the maximum urban development area) to support California tiger salamander, California red-legged frog, and/or western pond turtle.	SO-7. Create an approximately 0.12 ac California tiger salamander breeding pond; enhance existing main stock pond.	California tiger salamander, California red-legged frog	Construct California tiger salamander breeding pond in upper tributary, and improve main stock pond conditions.
Goal 4: Restore wetlands and create ponds in the Preserve System to contribute to the recovery of covered species.			
Objective 4.2. Restore 5 wetted ac of alkali wetlands.	SO-8. Restore approximately 2.32 ac of alkali wetlands.	California red-legged frog	Create alkali wetland complex on site.

HCP/NCCP Goals and Objectives	UHCW Site-specific Restoration Objectives	Covered Species Benefited	Site-specific Restoration Measures
Objective 4.4. Create 8 ac of ponds to support California tiger salamander, California red-legged frog, and/or western pond turtle.	SO-9. Create an approximately 0.12 ac California tiger salamander breeding pond in upper tributary; enhance existing main stock pond.	California tiger salamander, California red-legged frog	Construct California tiger salamander breeding pond in upper tributary, and improve main stock pond conditions.
Goal 30: Maintain and enhance instream aquatic habitat for covered species and native fish.			
Objective 30.6. Improve stream flow and connectivity for native aquatic wildlife	SO-10. Restore 489 linear feet of stream channel and hydrologically connect Upper Hess Creek from the main stock pond to channel at property boundary.	California tiger salamander, California red-legged frog	Remove existing dam at upper stock pond and existing road crossing. Connect the lower stock pond outflows to channel at property boundary via the proposed alluvial valley alkali wetland restoration.
Goal 31: Restore streams and riparian woodland/scrub			
Objective 31.3. Restore species richness and diversity, vegetative cover, wildlife habitat function and hydrologic function	SO-11. Create 0.12 ac California tiger salamander pond, enhance existing main pond, restore 489 linear feet of channel, restore approximately 2.32 ac of alkali wetlands.	California tiger salamander, California red-legged frog	Construct California tiger salamander breeding pond in upper tributary, and improve main stock pond conditions. Remove existing dam at upper stock pond and existing road crossing. Connect the lower stock pond outflows to channel at property boundary via the proposed alluvial valley alkali wetland restoration.

APPENDIX B.
SITE INSTALLATION PHOTOS

Figure B-1. Silt / Wildlife Exclusion Fence installation. (4 August 2011)

Figure B-2. Alluvial Valley sub-grade excavation. (9 August 2011)

Figure B-3. Alluvial Valley sub-grade excavation at the upstream transition area. (15 August 2011)

Figure B-4. Soil harvest from the Clay Borrow Area. (18 August 2011)

Figure B-5. Imported clay placement in the Alluvial Valley. (18 August 2011)

Figure B-6. Soil placement between the clay risers at the Alluvial Valley. (6 September 2011)

Figure B-7. Rough grading at the CTS Pond. (18 October 2011)

Figure B-8. Grading at the Main Stock Pond. (18 October 2011)

Figure A-9. The Channel Restoration Area following seeding and straw placement. (9 November 2011)

Figure A-10. The new Ranch Road Crossing following seeding and straw placement. (9 November 2011)

APPENDIX C.
PHOTO-DOCUMENTATION

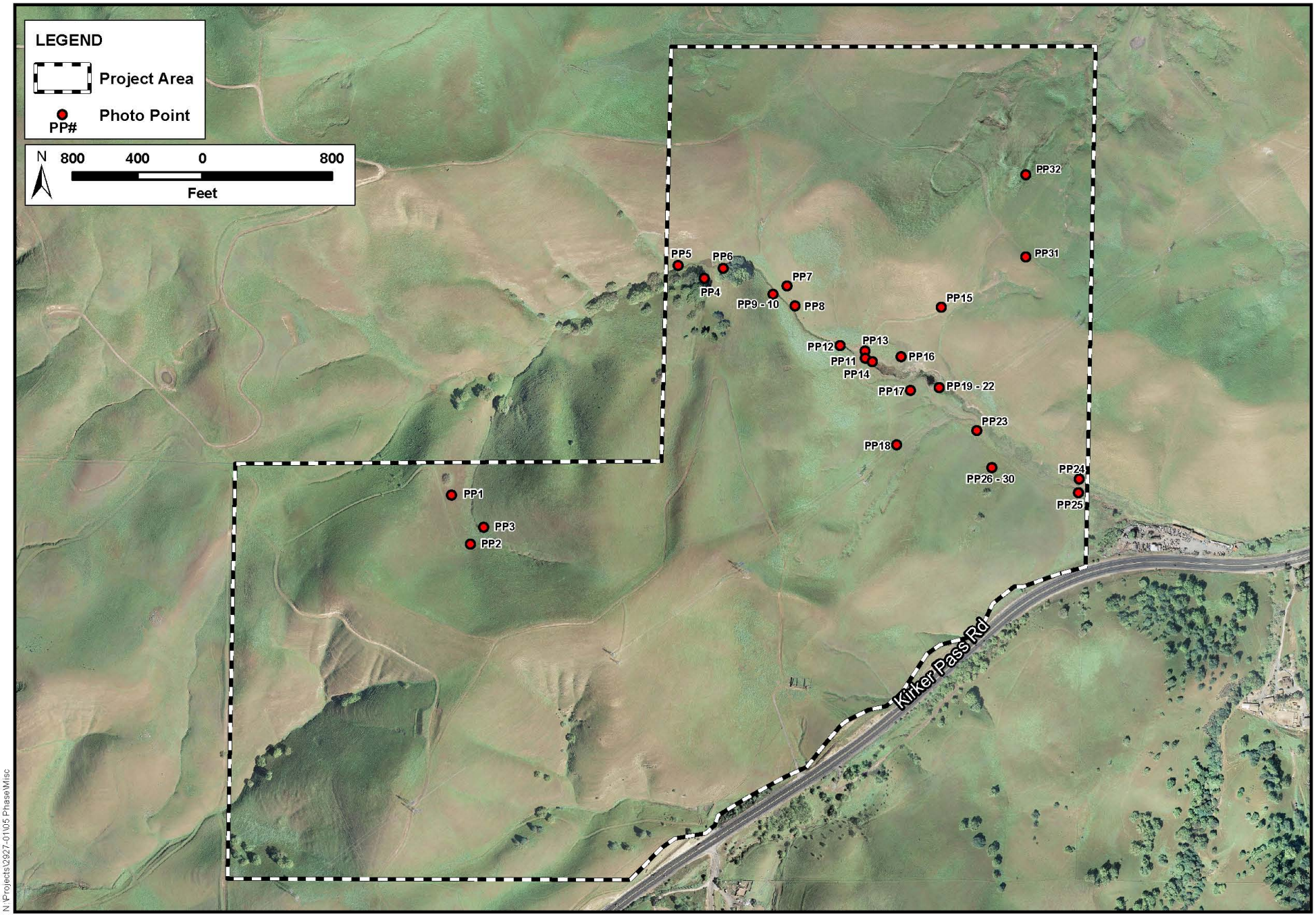

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Figure C-1: Photo Point Locations Map

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Photo Point 1. Looking southeast across the CTS Pond.

Photo Point 2. Looking north across the CTS Pond.

Photo Point 3. Looking west across the CTS Pond.

Photo Point 7. Looking southeast over the new Ranch Road Crossing.

Photo Point 8. Looking southwest over the new Ranch Road Crossing.

Photo Point 9. Looking east over the new Ranch Road Crossing and the edge of the Excess Fill Placement Area.

Photo Point 10. Looking southeast over the new Ranch Road Crossing and the edge of the Excess Fill Placement Area.

Photo Point 11. Looking northwest over the Channel Restoration Area.

Photo Point 12. Looking southeast over the Channel Restoration Area.

Photo Point 13. Looking west across the Channel Restoration Area.

Photo Point 14. Looking southeast towards the Main Stock Pond.

Photo Point 15. Looking towards the Main Stock Pond.

Photo Point 16. Looking southeast across the Main Stock Pond.

Photo Point 17. Looking northeast towards the Main Stock Pond.

Photo Point 18. Looking across the Main Stock Pond.

Photo Point 19. Looking south across the Main Stock Pond.

Photo Point 20. Looking southwest across the Main Stock Pond.

Photo Point 21. Looking west across the Main Stock Pond.

Photo Point 22. Looking southeast across the Alluvial Valley.

Photo Point 23. Looking southeast down the Alluvial Valley.

Photo Point 24. Looking west across the Alluvial Valley.

Photo Point 25. Looking southeast up the Alluvial Valley.

Photo Point 26. Looking west across the Alluvial Valley.

Photo Point 27. Looking north across the Alluvial Valley.

Photo Point 28. Looking northeast across the Alluvial Valley.

Photo Point 29. Looking east down the Alluvial Valley.

Photo Point 30. Looking southeast down the Alluvial Valley.

Photo Point 31. Looking northwest across the Clay Borrow Area.

Photo Point 32. Looking southeast across the Clay Borrow Area.