

RECLAMATION

Managing Water in the West

Categorical Exclusion Checklist

Hydrologic Monitoring and Modeling of Hardpan Vernal Pools to Support Restoration Design

MP-CEC-13-02

Prepared by:

Douglas Kleinsmith
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Natural Resources Specialist
Mid-Pacific Regional Office

Date: 9/20/13

Concurred by:

[Signature]
Archaeologist
Mid-Pacific Regional Office

Date: 9/20/13

Concurred by:

[Signature]
Native American Affairs Program
Coordinator
Mid-Pacific Regional Office

Date: 9/23/2013

Concurred by:

[Signature]
Daniel Strait
Program Manager, Central Valley
Project Conservation Program
Mid-Pacific Regional Office

Date: 9/24/13

Approved by:

[Signature]
Anastasia T. Leigh
Regional Environmental Officer
Mid-Pacific Regional Office

Date: 9/20/2013



U.S. Department of the Interior
Bureau of Reclamation
Mid Pacific Region

September 2013

Action

Reclamation proposes to provide \$103,147 from the Central Valley Project Conservation Program (CVPCP) to cbec, inc. eco engineering to identify the hydrologic differences between created and natural vernal pools, and quantify the potential hydrologic impacts of created vernal pools on adjacent natural vernal pools.

Exclusion Category

516 DM 14.5 A.3: Research activities, such as nondestructive data collection and analysis, monitoring, modeling, laboratory testing, calibration, and testing of instruments or procedures and non-manipulative field studies.

Scope of Work

Background

Vernal pool habitat enhancement, through the creation of constructed vernal pools within a natural landscape, is assumed to have a direct hydrologic impact on naturally occurring vernal pools. However, this assumption is based on limited physical or scientific data. The U.S. Fish and Wildlife Service (FWS) is unclear about supporting vernal pool enhancement as they still have unanswered questions pertaining to the hydrologic vulnerability of the natural vernal pools. In addressing their questions, this study aims to complete a focused multi-year assessment of created hardpan vernal pools that have been constructed adjacent to natural vernal pools.

Objectives

The proposed research includes the following objectives: 1) identify the hydrologic differences between created and natural vernal pools; and 2) quantify the potential hydrologic impacts of created vernal pools on adjacent natural vernal pools. This study will address the stated objectives by: 1) refining the conceptual understanding of the hydrologic function of hardpan vernal pools; 2) developing a physically based hydrologic model that can be used to provide a scientific basis for future hardpan vernal pool mitigation and restoration design; 3) developing statistically based protocols to inform future mitigation monitoring, and 4) publishing journal articles representing original scientific contributions to knowledge.

Project Location

Two vernal pool mitigation / restoration sites within the CVPCP area (see attached figures) have been equipped with hydrologic monitoring equipment as part of ongoing research that has been maintained over the last four water years. Both restoration sites include created vernal pools constructed adjacent to natural vernal pools. The first restoration site, located to the northwest of the interchange between State Routes 70 and 149, is the Butte County Association of Governments Highway 149/70 Mitigation Project constructed by Restoration Resources in Butte

County, California. This site supports vernal pool fairy shrimp, vernal pool tadpole shrimp, and Butte County meadow foam. The second restoration site, located southwest of the city of Lincoln, California, is the Orchard 80 Preserve constructed by Wildlands, Inc. This site supports vernal pool fairy shrimp.

Summary of Tasks

Task 1 – Process Monitoring Data

This task finalizes the processing of the four years of hydrologic monitoring data, collected at the research sites in a separate project not associated with the proposed action, to prepare the data for use in Task 4.

Task 2 – Topographic Survey

Topographic surveys will be conducted at both research sites, in conformance with U.S. Army Corps of Engineers standards, through use of a 4-wheel all-terrain vehicle (ATV), to describe the land-water interface of vernal pools at the research sites. Survey data will be collected with a Global Positioning System (GPS) receiver to provide survey grade horizontal and vertical positioning data with real-time Global Navigation Satellite System reference station data and corrections acquired using the California Surveying Virtual Survey Network. Following initial review, a supplemental ground survey will be performed on foot to measure depressions, vernal pools, swales, and ridges not fully captured by the ATV survey.

Task 3 – Ground Penetrating Radar Survey

Ground penetrating radar (GPR) surveys will be conducted at both research sites to describe the vernal pool restrictive layer interface (i.e., hardpan, claypan). An antenna mounted on a SmartChariot or sled will be towed behind the ATV. The GPR antenna will be integrated with GPS to provide survey grade horizontal and vertical positioning of the GPR antenna at the ground surface.

Task 4 – Hydrologic Modeling and Analysis

Hydrologic models for each research site will be developed using the numerical model HYDRUS. The models will be calibrated and validated using the monitoring data analyzed as part of Task 1. The models will allow the cbec, inc. eco engineering research team to understand the movement of water through each research site above the subsurface restrictive layer, the hydroregime of vernal pools at the sites and their ecological values, and potential changes in the hydroregime of adjacent natural vernal pools resulting from the construction of vernal pools at the sites.

As part of the analysis, long-term rainfall records from neighboring weather stations will be used to generate representative records for dry, normal, and wet conditions, which will allow the team to understand and infer how the vernal pools will function under variable climatic conditions, including future climate change. The hydroregimes of the natural vernal pools at the sites will be evaluated by deconstructing the as-built condition of the sites to a hypothetical condition that would have existed at the sites without the presence of constructed vernal pools. Water year-type

effects will be evaluated using the four years of previously collected monitoring data in Task 1. Climate change effects will be evaluated using long-term precipitation records and estimates of future climate change. Outputs from models developed through the proposed action will then be used to develop quantitative criteria to inform future restoration design and future mitigation monitoring design.

Task 5 – Reporting

A journal-style report prepared for publication as part of the research project will be provided. The report will include details of the study methods, results, and findings, complete with graphics, tables, and statistical results.

Endangered Species Impacts

The majority of the project activities at both sites will take place during the dry season when impacts to vernal pool species and hydrologic functions are least likely. However, saturated soils will yield better results for the ground-penetrating radar survey, so a portion of the ATV surveys may be conducted early in the wet season when some subsurface moisture has accumulated. During these surveys, the ATV will not traverse into any vernal pools in which water is ponded. While ATV movement through both research sites has the potential to move over ground where dormant vernal pool fairy shrimp and tadpole shrimp cysts may be deposited, the weight of the ATV is not expected to crush individual cysts. Ground disturbance from the ATV would not cause nearly the same amount of disturbance as cattle, which are regularly grazing at both sites. In addition, activities at the Butte County site will avoid direct and indirect impacts to Butte County meadow foam by restricting ATV use around any identified individual(s).

Reclamation requested concurrence from FWS on August 7, 2013 that the proposed action may affect, but is not likely to adversely affect federally listed species. FWS concurred with this finding on September 12, 2013. (See attached memo.)

Extraordinary Circumstances

Below is an evaluation of the extraordinary circumstances as required in 43 CFR 46.215.

1. This action would have a significant effect on the quality of the human environment (40 CFR 1502.3). No ☒ Uncertain ☐ Yes ☐
2. This action would have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources (NEPA Section 102(2)(E) and 43 CFR 46.215(c)). No ☒ Uncertain ☐ Yes ☐

- | | | | | | | |
|---|----|-------------------------------------|--|--------------------------|-----|--------------------------|
| 3. This action would have significant impacts on public health or safety (43 CFR 46.215(a)). | No | ☒ | Uncertain | ☐ | Yes | ☐ |
| 4. This action would have significant impacts on such natural resources and unique geographical characteristics as historic or cultural resources; parks, recreation, and refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (EO 11990); flood plains (EO 11988); national monuments; migratory birds; and other ecologically significant or critical areas (43 CFR 46.215 (b)). | No | ☒ | Uncertain | ☐ | Yes | ☐ |
| 5. This action would have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks (43 CFR 46.215(d)). | No | ☒ | Uncertain | ☐ | Yes | ☐ |
| 6. This action would establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects (43 CFR 46.215 (e)). | No | ☒ | Uncertain | ☐ | Yes | ☐ |
| 7. This action would have a direct relationship to other actions with individually insignificant but cumulatively significant environmental effects (43 CFR 46.215 (f)). | No | ☒ | Uncertain | ☐ | Yes | ☐ |
| 8. This action would have significant impacts on properties listed, or eligible for listing, on the National Register of Historic Places as determined by Reclamation (LND 02-01) (43 CFR 46.215 (g)). | No | ☒ | Uncertain
<i>See
Attachment A</i> | ☐ | Yes | ☐ |
| 9. This action would have significant impacts on species listed, or proposed to be listed, on the List of Endangered or Threatened Species, or have significant impacts on designated critical habitat for these species (43 CFR 46.215 (h)). | No | ☒ | Uncertain
<i>See
Attachment B</i> | ☐ | Yes | ☐ |
| 10. This action would violate a Federal, tribal, State, or local law or requirement imposed for protection of the environment (43 CFR 46.215 (i)). | No | ☒ | Uncertain | ☐ | Yes | ☐ |
| 11. This action would affect ITAs (512 DM 2, Policy Memorandum dated December 15, 1993). | No | ☒ | Uncertain
<i>See
Attachment C</i> | ☐ | Yes | ☐ |

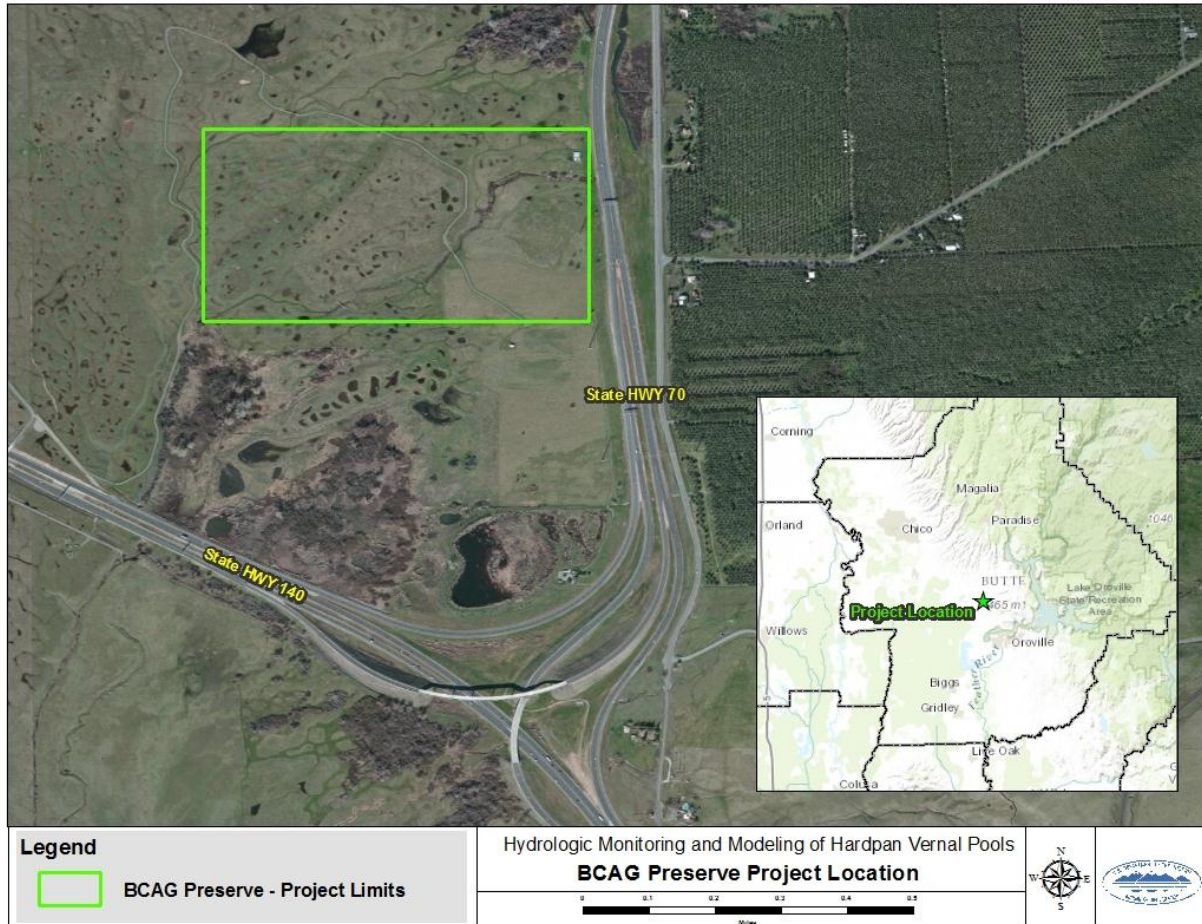
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| 12. This action would have a disproportionately high and adverse effect on low income or minority populations (EO 12898) (43 CFR 46.215 (j)). | No ☒ Uncertain ☐ Yes ☐ |
| 13. This action would limit access to, and ceremonial use of, Indian sacred sites on Federal lands by Indian religious practitioners or significantly adversely affect the physical integrity of such sacred sites (EO 13007, 43 CFR 46.215 (k), and 512 DM 3)). | No ☒ Uncertain ☐ Yes ☐ |
| 14. This action would contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of such species (Federal Noxious Weed Control Act, EO 13112, and 43 CFR 46.215 (l)). | No ☒ Uncertain ☐ Yes ☐ |

NEPA Action Recommended

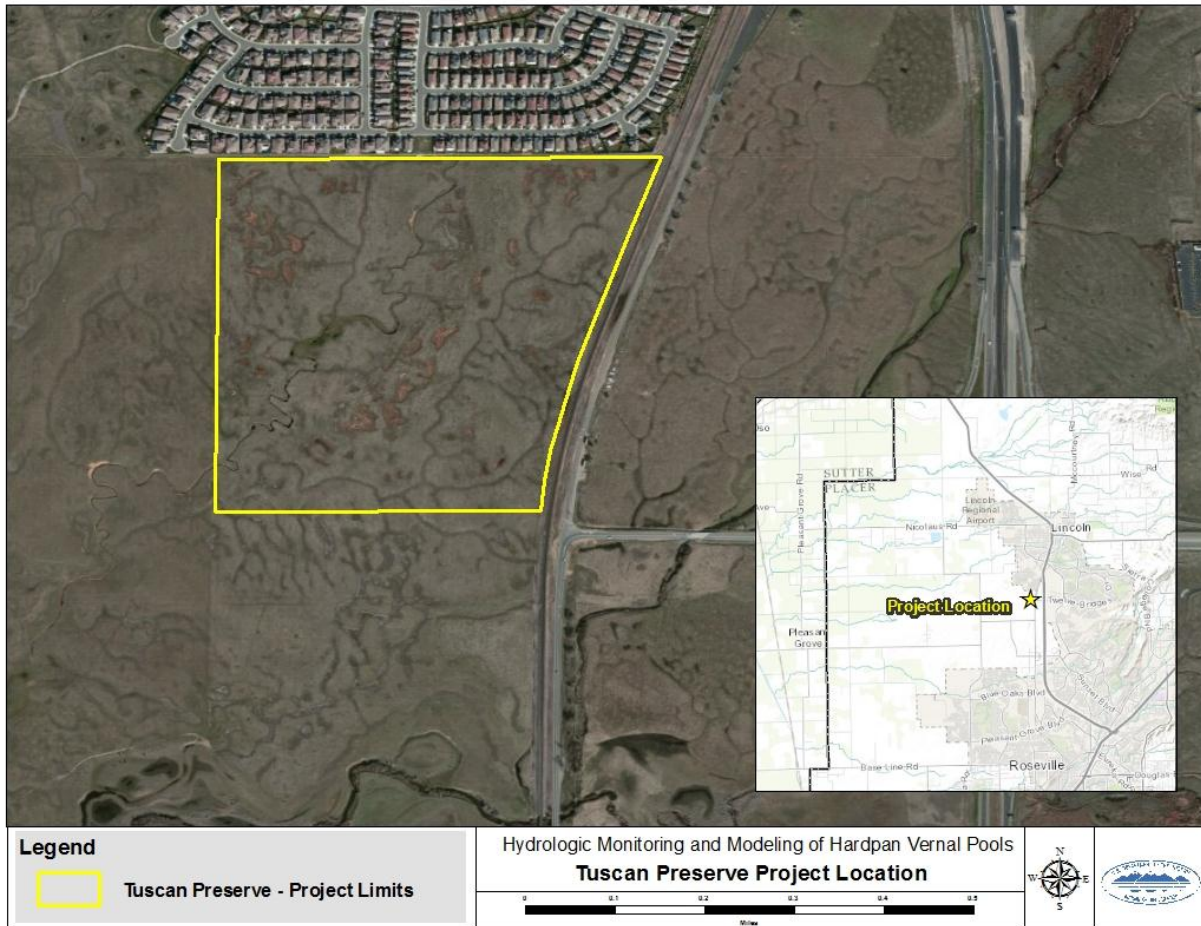
☒ CEC – This action is covered by the exclusion category and no extraordinary circumstances exist. The action is excluded from further documentation in an EA or EIS.

☐ Further environmental review is required, and the following document should be prepared.

- ☐ EA
- ☐ EIS



Research Site No. 1 – Butte County, California



Research Site No. 2 – Lincoln, California

Attachment A
Cultural Resources Concurrence Memo



IN REPLY
REFER TO:
MP-153
ENV-3.00

United States Department of the Interior

BUREAU OF RECLAMATION
Mid-Pacific Regional Office
2800 Cottage Way
Sacramento, California 95825-1898

VIA ELECTRONIC MAIL ONLY

May 31, 2013
MEMORANDUM

To: Daniel Strait
Manager, CVP Conservation Program and CVPIA Habitat Restoration Program, Division of Environmental Affairs MP-152

From: William E. Soule
Archaeologist, Division of Environmental Affairs MP-153

Subject: 13-CCAO-199 Hydrologic Monitoring and Modeling of Hardpan Vernal Pools to Support Restoration Design

This proposed undertaking by Reclamation is the providing of Federal funds through the CVP Conservation Program and the CVPIA Habitat Restoration Program for a project to monitor and model both natural and created vernal pools. This is the type of undertaking that does not have the potential to cause effects to historic properties, should such properties be present, pursuant to the National Historic Preservation Act (NHPA) Section 106 regulations codified at 36 CFR Part 800.3(a)(1).

In order to quantify the potential hydrologic effects of created vernal pools on adjacent natural vernal pools, cbec inc. eco engineering proposes to conduct fieldwork at two sites (Butte and Placer counties) containing both natural and constructed vernal pools. Proposed fieldwork will include above ground topographic surveys on foot and using ATVs, the use of ground penetrating radar to survey below ground, the collection of data from the existing levelloggers (25 at each site) and micro weather stations (1 at each site), the development of a computer generated hydrologic model, and the preparation of reports. This use of Federal funds constitutes an undertaking pursuant with Section 301(7) of the NHPA (16 U.S.C. 470). This proposed undertaking will not produce any ground disturbances.

I concur with a cultural resources evaluation in the Environmental Assessment (EA) for this action which states that it does not have the potential to cause effects to historic properties pursuant to 36 CFR § 800.3(a)(1). With this determination, Reclamation has no further Section 106 obligations. This memorandum is intended to convey the completion of the NHPA Section 106 process for this undertaking. Please retain a copy in the administrative record for this action. Should changes be made to this project, additional NHPA Section 106 review, possibly including consultation with the State Historic Preservation Officer, may be necessary. Thank you for providing the opportunity to comment.

CC: Cultural Resources Branch (MP-153), Anastasia Leigh – Regional Environmental Officer (MP-150)

Attachment B
Endangered Species Concurrence Memo



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846



In Reply Refer To
08ESMF00-2013-I-0604-1

Memorandum

To: Regional Environmental Officer, Mid-Pacific Regional Office
U.S. Bureau of Reclamation, Sacramento, California

From: Chief, Sacramento Valley Division
Sacramento Fish and Wildlife Office, Sacramento, California

Subject: Informal Consultation on the Proposed Hydrologic Monitoring and Modeling of
Hardpan Vernal Pools to Support Restoration Design, Butte and Placer Counties,
California

SEP 12 2013

BUREAU OF RECLAMATION OFFICIAL FILE COPY RECEIVED		
SEP 18 2013		
CODE	ACTION	SURNAME & DATE
150	✓	D. H. H. 9/18/13

This is in response to your August 7, 2013, memorandum (memo) and supporting documentation requesting informal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed Hydrologic Monitoring and Modeling of Hardpan Vernal Pools to Support Restoration Design (proposed project) in Butte and Placer Counties, California, for potential effects to the federally-listed as threatened vernal pool fairy shrimp (*Branchinecta lynchi*) and the federally-listed as endangered vernal pool tadpole shrimp (*Lepidurus packardii*) (collectively, the vernal pool crustaceans) and Butte County meadowfoam (*Limnanthes floccosa* ssp. *californica*) (meadowfoam). We received your request on August 9, 2013. You requested our concurrence with your determination that the proposed project may affect, but is not likely to adversely affect the vernal pool crustaceans and the meadowfoam. Critical habitat for the vernal pool crustaceans and the meadowfoam has been designated; however, none will be affected by the proposed project. Our primary concern is the protection of federally-listed species pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. §1531 *et seq.*) (Act).

The findings and recommendations in this consultation are based on: (1) your August 7, 2013, memo initiating consultation and the attached grant application package received by the Service on August 9, 2013, and (2) the August 20, 2013, memo and attached supplemental maps received by the Service on August 29, 2013.

The federal action we are consulting on is the Bureau of Reclamation (BOR) providing grant funding through the Central Valley Project Conservation Program (CVPCP) to cbec, inc. eco engineering (applicant) for the proposed project. The proposed project is located on two existing mitigation sites that have been restored with artificial pools to support vernal pool species. The Butte County Association of Governments Highway 149/70 Mitigation Project (BCAG site) is located northwest of the interchange between State Routes 70 and 149 in Butte County. The

SCANNED

Classification	ENV-7.00
Project	214
Control No.	13042304
Folder I.D.	1222677
Date Input & Initials	9-18-13

proposed project will occur on a 19-acre subset of the BCAG site consisting of natural and constructed vernal pools on a single terrace underlain by a duripan of variable depth and character. The vernal pool crustaceans and the meadowfoam are known to occur on the BCAG site. The Orchard 80 Preserve (Tuscan site) is located southwest of the City of Lincoln in Placer County adjacent to the Orchard Creek Conservation Bank. The proposed project will occur on a 16-acre subset of the Tuscan site consisting of natural and constructed vernal pools. The vernal pool fairy shrimp is known to occur on the Tuscan site.

The proposed project consists of an all-terrain vehicle (ATV) survey to collect ground surface data using Real-Time Kinematic Global Positioning System (RTK GPS) receivers and a supplemental survey to be performed on foot. Data acquisition will take approximately six days. The ATV will also pull ground-penetrating radar (GPR) on evenly-spaced transects that will take approximately two days to complete. The majority of proposed project activities will take place during the dry season; however, a portion of the ATV surveys may be conducted early in the wet season when some subsurface moisture has accumulated, yielding better GPR results. The ATV will not enter any vernal pools that have ponded water. On the BCAG site, ATV use will be restricted around any identified meadowfoam plants.

Based on our review of the information provided, the Service concurs with your determination that the proposed project is not likely to adversely affect the vernal pool crustaceans or the meadowfoam. The weight of the ATV is not expected to crush individual cysts during the dry season. Ponded pools and meadowfoam plants will be avoided. In addition, the information gathered may lead to beneficial effects in the long-term due to improvements in vernal pool restoration design. Therefore, unless new information reveals effects of the proposed action that may affect listed species in a manner or to an extent not considered, or a new species or critical habitat is designated that may be affected by the proposed action, no further action pursuant to the Act is necessary.

If you have any questions regarding the proposed Hydrologic Monitoring and Modeling of Hardpan Vernal Pools to Support Restoration Design, please contact Lily Douglas, Fish and Wildlife Biologist, at (916) 414-6645.

cc:

CVPIA HRP Manager, U.S. Fish and Wildlife Service, Sacramento, CA

BUREAU OF LAND MANAGEMENT
FIP-MAIL-01
2013 SEP 13 PM 12:40

Attachment C

Indian Trust Assets Concurrence Memo



KLEINSMITH, DOUGLAS <dkleinsmith@usbr.gov>

Re: ITA request for Monitoring/Modeling Vernal Pools

RIVERA, PATRICIA <privera@usbr.gov>
To: DOUGLAS KLEINSMITH <dkleinsmith@usbr.gov>

Thu, Aug 22, 2013 at 7:43 AM

Doug,

I reviewed the proposed action to provide \$103,147 from the Central Valley Project Conservation Program (CVP/CP) to CBEC Inc. Eco Engineering. to: 1) identify the hydrologic differences between created and natural pools; and 2) quantify the potential hydrologic impacts of created pools on adjacent natural pools. This study will address the stated objectives by: 1) refining the conceptual understanding of the hydrologic function of hardpan vernal pools; 2) developing a physically based hydrologic model that can be used to provide a scientific basis for future hardpan vernal pool mitigation and restoration design; 3) developing statistically based protocols to inform future mitigation monitoring, and 4) publishing journal articles representing original scientific contributions to knowledge.

Two vernal pool mitigation / restoration sites within the CVP/CP/Habitat Restoration Program area will be studied.

The first restoration site, BCAG Preserve, located to the northwest of the interchange between State Routes 70 and 149, is the Butte County Association of Governments Highway 149/70 Mitigation Project constructed by Restoration Resources. This site has vernal pool fairy shrimp, vernal pool tadpole shrimp, and Butte County meadowfoam,

The second restoration site, Tuscan Preserve, located southwest of Lincoln, CA, is the Orchard 80 Preserve constructed by Wildlands, Inc. This site has vernal pool fairy shrimp.

The proposed action does not have a potential to impact Indian Trust Assets.

The nearest ITA to the first restoration site is the Berry Creek Rancheria approximately 9 miles SW of the project location.

The nearest ITA to the second restoration site is the Auburn Rancheria approximately 8 miles South of the project location.

Patricia Rivera
Native American Affairs Program Manager
US Bureau of Reclamation
Mid-Pacific Region
2800 Sacramento, California 95825
(916) 978-5194