FINAL
ENVIRONMENTAL STATEMENT

YOLO COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
APPLICATION UNDER THE SMALL RECLAMATION PROJECTS ACT

PREPARED BY
BUREAU OF RECLAMATION
U.S. DEPARTMENT OF THE INTERIOR

JULY 1971

ELLIS L. ARMSTRONG
COMMISSIONER
Yolo County Flood Control and Water Conservation District application for a loan and grant under the Small Reclamation Projects Act for the Indian Valley Project, California, Prepared by the Department of the Interior, Bureau of Reclamation

( ) Draft  (X) Final

1. (X) Administrative Action  ( ) Legislative Action

2. The Indian Valley Project is comprised of a multipurpose dam and Reservoir and recreation facilities located on the North Fork of Cache Creek, Lake County, California.

3. Summary of environmental impact:
   a. About 4,000 acres of an intermittent flowing stream and adjacent area now used for cattle grazing and winter deer browse would be inundated and replaced by a reservoir and downstream fishery where none now exists.
   b. Three rare plant species would be partly endangered.
   c. Possible archeological sites would be inundated.
   d. The reservoir would provide supplemental water to 83,000 acres of irrigated land to stabilize a declining ground-water basin, provide flood protection, fishery enhancement, and outdoor recreation benefits.

4. List of alternatives considered:
   a. No project.
   b. Smaller reservoir capacity.
   c. Multipurpose reservoir.

5. Comments have been received from the following agencies: The Resources Agency of California; Environmental Protection Agency; Corps of Engineers, Department of the Army; and the Bureau of Sport Fisheries and Wildlife, National Park Service, and Bureau of Land Management, Department of the Interior.

6. Draft Statement was made available to the Council on Environmental Quality on February 24, 1971, and the Final Statement is now being transmitted to the Council.
FINAL ENVIRONMENTAL STATEMENT

Yolo County Flood Control and Water Conservation District
Small Reclamation Projects Act loan and grant application for the Indian Valley project in compliance with Section 102(2)(C) of the National Environmental Policy Act of 1969 (Public Law 91-190)

Description of Project

The Yolo County Flood Control and Water Conservation District of Woodland, California, has applied for a Small Reclamation Projects Act loan of $2,123,800 and project grants for $2,961,700 for flood control and $1,215,100 for fish and wildlife enhancement to assist in financing the construction of the Indian Valley Project. The Indian Valley Dam and Reservoir are the only facilities to be constructed and would be located in Lake County, California, on the North Fork of Cache Creek. Benefits from the project would be derived from irrigation, flood control, fishery enhancement, outdoor recreation, and municipal and industrial water supplies.

The district has acquired the nearby Clear Lake Dam and Clear Lake which are located on the main stream of Cache Creek. The Indian Valley Project, on a tributary of Cache Creek downstream from Clear Lake, would be operated to provide long-term carryover storage. A firm schedule for reservoir operation is not possible as its operation other than for downstream fish flows would depend on each year's water availability from existing sources, including operation of Clear Lake. This storage would supplement natural downstream flow accretions and Clear Lake releases to assist in stabilizing the groundwater levels of the project service area located some 56 river miles downstream from the project storage facilities. The service area lies in the lower Cache Creek Valley and extends generally eastward some 35 miles to the Yolo Bypass of the Sacramento River. In addition to the Clear Lake storage facilities, the district now owns and operates about 150 miles of main conveyance canals and 40 miles of sublaterals in the service area.

The project service area contains 158,000 acres, of which 83,000 acres are now irrigated. The water supply to be developed by the project would be supplemental to the existing water supply for the 83,000 acres under irrigation. Although no new lands would be irrigated, the supplemental supply to be developed would irrigate an equivalent of 13,500 additional acres if it were provided as a full supply to new lands. The principal crops produced include orchards, tomatoes, alfalfa, and sugar beets. The first diversion for irrigation in the area was in 1856.

There are several communities within the service area; however, municipal and industrial water supplies are all obtained from ground water which the proposed project would help to stabilize. To the extent of a stabilized or decreased pump lift, these benefits would be minor.
The project water supply primarily is obtained by private pumping from the ground-water basin underlying the service area. Because of the geologic configuration of the lower Cache Creek Valley, it is not possible to determine an average ground-water level decline. Based on land and water use, it is believed that the annual pumping overdraft on a long-term basis would be about 60,000 acre-feet.

Indian Valley Reservoir would inundate about 4,000 acres of land at maximum water surface. About 4,000 acre-feet of water would be retained in the dead storage pool for fish and wildlife purposes. Flood control storage space would increase uniformly from zero on September 15 to 40,000 acre-feet on November 1, hold at this amount to March 15 of the following year, and then decrease uniformly to zero on June 1. The remaining 256,000 acre-feet of space would be operated for conservation storage. Flood releases would be coordinated with releases from Clear Lake and local inflow to limit flow in Cache Creek near Capay to 21,000 cubic feet per second, which is the channel capacity at that point. A minimum release of 10 cubic feet per second will be continuously maintained to create a new fishery in the North Fork of Cache Creek for 13 miles downstream from the dam to the confluence with Cache Creek. This reach of the North Fork of Cache Creek is usually dry during summer and fall months. The minimum release would also enhance the fishery value of main-stem Cache Creek for 43 miles downstream to the district's Capay Diversion Dam at the service area.

The Cache Creek drainage basin operates as a closed basin during summer months as virtually no runoff or return flow reaches the Yolo Bypass of the Sacramento River. Such flows normally percolate to the underground supply. During winter months, only the runoff from intense or prolonged rains reaches the Yolo Bypass. Although the quality of the water varies with the flow, the overall quality is excellent. Published records of the U.S. Geological Survey for the period 1963 to 1967, for example, show that a flow of 872 cubic feet per second at Yolo Bypass contained 122 parts per million of total dissolved solids while a flow of 1.5 cubic feet per second contained only 352 parts per million. These records are with Clear Lake Reservoir in operation. No significant water quality problems are anticipated as a result of operation of the proposed Indian Valley Reservoir.

Environmental Impact

The overall environmental impact of the proposed Indian Valley Project is predominantly favorable. The construction and operation of Indian Valley Dam and Reservoir should provide both immediate and long-range benefits in terms of recreation, fish enhancement, flood control, and water conservation. The long-time carryover storage available from the water conservation function of the project will stabilize the surface water supplies available to the service area, which, under present conditions, are subject to major fluctuations which have ranged from a low of 13,000 acre-feet to a high of 189,000 acre-feet.
The project is multipurpose and would, in addition to water conservation and flood control functions, provide for a new reservoir fishery with 3,800 acres of water surface and 39 miles of shoreline. Additionally, a minimum downstream release at the dam will improve the existing fishery in Cache Creek below the confluence of North Fork of Cache Creek and will create a new fishery in the 13 miles of stream below the dam. The latter reach of river heretofore has been dry from 3 to 6 months each year in the summer and fall.

The Corps of Engineers, Department of the Army, has found that operation of the reservoir for flood control purposes would reduce damages downstream on Cache Creek and estimates that flood control benefits would be widespread.

The district will provide, as part of project construction, and thereafter manage two units of on-shore public use facilities, with public access thereto, which together provide 12 lands of concrete boat-launching ramps about 800 feet long, adequate parking facilities, potable water supply, and sanitary facilities. These facilities would accommodate an estimated initial annual use of 50,000 visitor-days and with staged construction for an estimated ultimate use of 150,000 annual visitor-days. One unit would be located near the damsite, and the other near the upper end of the reservoir.

Most of the land surrounding the potential reservoir is public domain under the jurisdiction of the Bureau of Land Management, which has managed the area on a multiple-use concept with emphasis on wildlife. The district will acquire title to all private lands remaining within the valley to preclude other forms of land development which might not be in accord with multipurpose reservoir operations.

The district will operate the reservoir to maintain a minimum pool of about 3,500 acres, except during critical dry years. Also, reservoir clearing would retain potential fish cover to the extent permitted by the State of California.

In terms of water quality, some portions of main-stem Cache Creek contribute significant amounts of boron in runoff. The water to be impounded in Indian Valley Reservoir is relatively boron-free and will assist in diluting the main-stem water released for irrigation. This will improve long-range crop production and will permit growing a higher value crop.

Adverse Environmental Effects

There are several adverse effects of the project. The Water Quality Office of the Environmental Protection Agency (formerly Federal Water Quality Administration) noted to the extent that winter flows are stored in the reservoir, other winter flows would be degraded. But, it recognized that winter flow degradation would be slight and of little consequence. It also
noted that the increased evaporation from creation of Indian Valley Reservoir could present a water quality problem in the future.

The Water Quality Office also urged recognition of a potential reservoir water reaerating problem in the future, but suggested an unconfined, aerating water release from the outlet works valve at the dam as a possible solution.

The adverse environmental effects of the proposed reservoir resulting from the inundation of 4,000 acres of land in the North Fork of Cache Creek Valley will affect the area's wildlife, certain species of plant life, and archaeological remains. These are discussed in more detail below.

The area also contains several species of plant life which are considered to be relatively rare that could be affected by the proposed reservoir. The particular species of flora are Brodiaea rosea, an onion-like plant of the lily family; a mixed stand of two species of cypresses, McNab and Sargent; and Erigonum tripodum, a species of buckwheat.

The Brodiaea rosea is considered to be the most rare and grows in several locations in the Valley. It is believed that one area would be completely inundated and other areas partially inundated. The district is aware of this problem and retained Dr. Theodore F. Niehaus as a consultant. Dr. Niehaus was formerly with the Department of Biology of the University of San Francisco and has done extensive research on Brodiaea rosea in preparing his doctorate thesis. As the plant can only be identified among other similar plants by its blossom, Dr. Niehaus made an inventory during the spring. A copy of Dr. Niehaus' report and recommendations is enclosed. At that time the location of the plants was identified with a view toward subsequent transplanting during their dormant cycle. It was found, however, that Brodiaea rosea grows in a number of locations primarily along tributary streams where soils have a high water content during winter months. Most of these locations are in the area which would be inundated only during brief periods when floodflows are stored temporarily before being
released to evacuate the flood storage pool. It is not believed that temporary inundation will injure the species; however, it is believed that suitable soils for transplant exist and that the plant is transplantable. Transplant is the least desirable method of preserving the species, but would be used should such action be necessary to assure perpetuation of the species. Most of the areas in which the plants were found are believed to be on lands under the jurisdiction of the Bureau of Land Management; however, the district will acquire all private lands in the valley, and plant locations will be protected from other forms of development.

Of the two stands of cypresses, one is outside the high-water line and not endangered. The other stand is only partially within the reservoir area and would be inundated only at higher reservoir storage levels.

In addition to the stands of *Eriogonum tripodum*, or buckwheat, located in the reservoir area, the plant is also found in abundance in Tehama County, and is also found in Eldorado and Tuolumne Counties.

In its letter of February 3, 1970, concerning this problem, copy attached, the Bureau of Land Management which administers surrounding lands states that the buckwheat and cypresses do not appear to be in danger of being lost.

The *Brodiaea rosea* is endangered and the previously mentioned letter states that the alternatives to its protection are reducing the reservoir water storage level by 50 feet or transplanting the bulbs above the high water line. A reduction of 50 feet in the maximum water surface would seriously reduce the active storage and would probably mean abandonment of the project. Transplanting the bulbs, however, is known to be feasible. The Bureau of Land Management states that the district could acquire the two parcels of land containing the species and transfer them to it for protection. It was also recommended that the Bureau of Land Management be consulted on the county road relocation.

Based upon actual field locations and additional exploration and upon the advice of Dr. Nicholus, the district will take those actions and acquire those lands necessary to perpetuate the *Brodiaea rosea* species. The district is aware of the road relocation problem and will consult with the Bureau of Land Management on possible routes for the road with the least environmental impact.

To evaluate possible archeological values within the reservoir area, the district by letter of January 19, 1971, copy attached, has allocated $4,320 to the National Park Service to conduct an archeological reconnaissance survey. This survey will be made during the spring months of 1971 which would be well in advance of project construction. Should valuable archeological sites be found, plans will be made for salvage of artifacts. To the extent necessary, the district would participate in the salvage program.
Vector problems which could arise from operation of the proposed Indian Valley Reservoir would be resolved in cooperation with State and local health organizations in accord with existing regulations.

All precautions would be taken by the district to minimize fire hazards, both during construction and during subsequent public use of recreational facilities. The district will cooperate with the California Division of Forestry and others in establishing rules for the use of fires and for effective means of fire control. With project operation, a permanent water supply available during dry summer months and the hunting season should enhance fire-fighting capability.

Although extensive mud flats could be exposed during periods of excessive reservoir drawdown, such an occurrence should be rare and only during extreme dry cycles. Only one such cycle has occurred during the past 90 years of records.

There are no additional known but unresolved environmental problems that could affect project construction.

**Alternatives to the Proposal**

There are no readily available alternative sources of water for the district, nor are there any alternatives available that would provide equivalent benefits in terms of fish enhancement, flood control, and water conservation. To forgo the proposed project as an alternative would mean a continuation of annual downstream flood damages which the project could help to alleviate. It would also mean that a further decline of the ground-water level can be expected with increased costs for deepening wells and installing larger motors and pumps to handle the increased pump lift. Secondarily, the higher cost of production, if not offset by higher prices received, will result in a decline of the area's economy.

**Short-Term Versus Long-Term Relationship**

The proposed project will assist in providing a stabilization of the district's agricultural community and a long-range enhancement of the human environment. The short-term uses are the same as the long-term uses.

**Irreversible Commitment of Resources**

While there would be a commitment of additional water resources to agricultural use, the stored water would extend the range of water uses for environmental enhancement. Those waters could be converted to other purposes but only at the expense of the agricultural economy. The 4,000 acres to be inundated by the reservoir would be irreversibly committed to that purpose.
Environmental Awareness

The district is cognizant of comments by various other agencies, including those of the State of California, relative to possible threats of land development encroachments adjacent to the reservoir and their effects on the reservoir water quality and downstream flows. The district has therefore undertaken to acquire all private land holdings within the valley to prevent this undesirable development. The district is cooperating with the U.S. Bureau of Land Management, the California Department of Fish and Game, and the Bureau of Sport Fisheries and Wildlife in developing a management plan for the best use and control of the land resources made available by the project.

Coordination

Preparation of the Yolo County Flood Control and Water Conservation District loan application was participated in, or reviewed by, the Resources Agency of California for the Governor of California, the Water Quality Office of the Environmental Protection Agency, the Bureau of Sport Fisheries and Wildlife, the Corps of Engineers of the Department of the Army, and the Bureau of Reclamation. Under the provisions of Office of Management and Budget Circular A-95, the California State Clearinghouse had no comments subsequent to notifying the following State agencies: Public Works, Parks and Recreation, Conservation, and State Lands Commission.

This final statement reflects the comments of the following reviewing agencies:

Corps of Engineers, Department of the Army
Environmental Protection Agency
The Resources Agency of California
Bureau of Sport Fisheries and Wildlife
Bureau of Land Management
National Park Service

The draft environmental statement was revised to incorporate information on the following items:

- Reservoir operations
- Equivalent average
- Water quality
- Flood operation requirements
- Peripheral land development
- Endangered species report
- Vector problems
- Fire hazards
- Mud flats
- Map of mitigation areas

Attachments
RARE PLANT STUDY
Indian Valley-Lake County, California

June 5, 1971

by

Dr. Theodore F. Nicaus
June 8, 1971

Mr. Joseph E. Patton
Chief Water Resources Engineer
Clair A. Hill & Associates
P.O. Box 2008
Redding, California 96001

Dear Mr. Patton,

Addendum to: Rare Plant Study; Indian Valley-Lake County, California

It has been brought to my attention that the proposed lake level of 1475 feet may occasionally be higher during large winter storms. Assuming that submersion is temporary little or no damage should occur to Brodiaea coronaria subsp. rosca. No known research data is available on how long this plant can survive without air. My observations of Brodiaea coronaria subsp. coronaria which grows near the edges of vernal pools (shallow rain filled hollows) is that it can and does survive 1-3 days of submergence.

Sincerely,

Dr. Theodore F. Michaus
1455 Spruce
Berkeley, Calif. 94709

RECEIVED
JUN 9 1971
CLAIR A. HILL & ASSOCIATES
Mr. Paul Jones, Project Engineer
Clair A. Hill & Associates
P.O. Box 2088
Redding, California

June 5, 1971

Dear Paul,

The report concerning the rare plants studies in Indian Valley, Lake County California is enclosed. It is my understanding that the area above the elevation 1475 feet will not be flooded. It should also be noted that if the area between elevations 1475-1500 feet is to be flooded that further research should be considered.

The alternate of exploring adjacent regions for new locations was not made as it presently appears that Brodiaea coronaria subsp. rosea will be above the maximum 1475 elevation. Should exploration of adjacent regions appear desirable during 1971, it must be done immediately as B. coronaria subsp. rosea will be out of flower about June 16th.

Transplantation is the least desirable solution for saving B. coronaria subsp. rosea. It can be attempted if the present reported solution or further exploration proved valueless.

Photographs of Brodiaea coronaria subsp. rosea are being processed and will be forwarded when ready. These should be considered a part of the report being submitted.

Sincerely,

Dr. Théodore Richaus
1455 Spruce
Berkeley, Calif. 94709
WRE

STUDY, INDIAN VALLEY--LAKE COUNTY  June 5, 1971

Three species of plants have been reported as being rare and possible endangered by the proposed Indian Valley Reservoir Project. Each species is discussed below.

I. The rarest plant is *Brodiaea rosea* (Greene) Baker or *B. coronaria* var. *rosea* (Greene) Hoover depending on which authority is followed. The very latest research paper on the entire genus *Brodiaea* is to be published later this year by the writer of this report. He will recognize this plant as *Brodiaea coronaria* subspecies *rosea* (Greene) Nichols. This subspecies is a very distinct biological entity found only in the Stanton Creek area of Indian Valley, Lake County. One herbarium specimen of a *Brodiaea* collected west of Paskenta, Tehama County strongly resembles *B. coronaria* subsp. *rosea*. I visited the site two years ago and did not find it. Thus the Stanton Creek locality is the only confirmed site for this species.

A intensive search on foot was made May 24 and 25, 1971. The search was made while *B. coronaria* subsp. *rosea* was in flower. The flowers are needed to make a positive identification. Extensive numbers of this species were observed around the perimeter of the Stanton Creek drainage. This species grows only in alluvial fans which have a high water content during the winter months. Adjacent soils without the high water content do not support this species. A map showing the observed locations is included in this report.

Most of the locations for this species are below the 1475 elevation of the proposed reservoir. The highest elevation where this species occurs is 1500 ft. The best concentrations are in the 1475-1500 foot zone.
One area was found where substantial numbers of *B. coronaria* subsp. *rosea* are above the 1475 elevation. This is the upper flat (or flood plain) and lower contiguous slopes of Stanton Creek. This area contains a large enough sample of this species for its preservation. Other areas of Indian Valley were searched and unless noted on the map in this report, no *B. coronaria* subsp. *rosea* was found. A number of recommendations are given below to ensure preservation of this endangered species.

II. A second unique plant of the Stanton Creek and Kilpepper Creek (which drains into Stanton Creek from the east) area are the hybrids between *Cupressus macrosiphana* Marr. and *Cupressus Sargentii* Jeps. The hybrids represent a significant evolutionary event which although known about has not been as yet studied by competent biologists.

The hybrids are located mainly along the present road on the east approach to Stanton Creek. Many of the hybrids are located near the maximum water elevation of 1475. Most of the hybrids are above the 1475 elevation and will not be affected.

III. The third rare plant is *Eriogonum triplodum* Greene. It grows on the flood plain of Stanton Creek. This species is known from a number of localities around the periphery of the central valley of California. Most of the plants on Stanton Creek are above the 1475 water line in same area as that for *Erodium coronaria* subsp. *rosea* on upper Stanton Creek.
The proposed road relocation across Stanton Creek as presently flagged would be the best route and would disturb the rare plants discussed above the least. On May 25, 1971, Mr. Robert Schobert of Clair Hill & Associates conferred and toured the above proposed road route with me. The approximate location is shown on the enclosed map. It is important that the road not be placed any further north on the east side of Stanton Creek as the best concentration of *Brodiaea coronaria* subsp. *rosea* is located immediately north of the proposed road.

It is understood that the land ownership where the three rare plants occur belongs to the U.S. Gov't., Bureau of Land Management. This matter will have to be determined so that following recommendation can be implemented.

**Recommendations for Management and Preservation of Rare Plants:**

1. **The natural growing cycle of *Brodiaea coronaria* subsp. *rosea*** and *Eriogonum trinodum* are directly tied to the normal winter wet season and summer drought of the Indian Valley area. Any changes in the cycle by man will result in the extinction of these species.
   a. **Natural flow of Stanton Creek** (including winter floods) must be maintained as is. Any check dams or diversions would be disastrous to the continued existence of the above plants.
   b. **No unnatural watering during the summer drought period.** The plants are dormant and any unnatural watering results in rotting of the plants.

2. **Trampling** or **mowing** of the preservation area by camp sites, boat launching area, or parking areas are highly undesirable. The best concentration of *B. coronaria* subsp. *rosea* occurs near small
small springs on both the east and west banks of Stanton Creek immediately above the proposed new road. These springs and particularly the surrounding area which derives water from these springs must be left undisturbed.

3. Both *Brodiaea coronaria* subsp. *rosa* and *Eriogonum tripodum* are plants which naturally grow and require full sun. An important ecological management consideration is to not allow the area being preserved from becoming overgrown with shrubs. The Chaparral Plant Community which is presently invading the proposed preservation area will shade out *Brodiaea* and *Eriogonum*. A natural ecological feature of the Chaparral Plant Community is an occasional fire which clears the land. This allows the many sun requiring herbaceous plants which are also a part of the chaparral community cycle to continue existing. Prior to White Man's presence, natural fire and the occasional ecological burning by the Indians accomplished the natural land clearing cycle.

It is recommended that a firebreak be built above the proposed preservation area and clear the site by fire at an appropriate time of the year. An alternate would be hand clearing and burning by a forestry conservation crew. The clearing cycle would probably be required every ten years or so. This will have to be determined by an annual inspection.

The area from the presently proposed new road across Stanton Creek to where the canyon narrows to high walls is all prime habitat for *Brodiaea* and *Eriogonum*. The uppermost area is presently choked with shrubs and the ground covered by pine needles. Few herbaceous sun requiring plants are now present, but would return if cleared. This same shading out process is presently occurring at a rapid rate
in the area immediately above the proposed new Stanton Creek road crossing.

The idea of clearing by burning may be highly controversial to some land managers. However recent research has shown that exclusion of fire is a grossly UNNATURAL ecological situation. This spring I have observed a number of areas where fire is now used as a land management tool. These are: Yosemite National Park, Sequoia National Forest, Kings Canyon National Park, and Sequoia National Park. These agencies would probably be willing to supply further information. A well researched and recent book on the topic is also available. It is in: Sierra Nevada by Verna R. Johnston, Houghton Mifflin Co. 1970. A excellent synopsis and photographs are reprinted as The Biology of Fire in the journal Audubon 72(5-Sept Issue):78-119.

4. Management of the hybrid Cupressus stand will probably require only exclusion of cutting.

5. It is recommended that the area from immediately above the proposed Stanton Creek road crossing be designated a Botanical or Natural History reserve. A fence along the north side of the road would be helpful to exclude camper trucks, etc. A small gate, small opening, or style over the fence would help preserve the fence and allow fisherman on foot to enter the area.
GENERAL OVERVIEW OF RARE PLANT LOCATIONS; INDIAN VALLEY, LAKE COUNTY, CALIF.
BROOMEA CORONARIA SUBSP. ROSEA WITHIN AREA BOUNDED BY MITT

ERIGONUM TRIPODUM AREA

LARGEST CONCENTRATION OF BROOMEA CORONARIA SUBSP. ROSEA.
Memorandum

To: Commissioner, Bureau of Reclamation

From: Director

Subject: EEW - Indian Valley, California

We have reviewed the EEW dated December 28, 1970.

We have looked into the question whether the reservoir will flood all or part of the habitat of one rare species of the plant genus *Brodiaea*, and two other plant rarities.

In an examination on the ground, the buckwheat (*Eriogonum tripodium*) was not identified. However, there seems no reason to doubt Dr. Stebbins' assertion that "half of the rather large population will be above the high water level . . .". Portions of the mixed stands of Hackab and Sargent cypress were identified. The westernmost of the two areas of *Brodiaea roxana* is protected by barbed wire fence built by Bureau of Land Management last summer. The eastern area could not be located; the new leaves have probably not reached the surface of the ground, and last year's leaves have disappeared.

All or part of all three rarities occur on public land as shown on the attached map.

The buckwheat and the cypresses do not appear to be in danger of being lost. Sufficient area and number of specimens of each kind of plant will be above high water to provide a viable population which can perpetuate itself.

The *Brodiaea* may be another matter. The western area will probably be completely flooded. If all plants will be flooded the alternatives appears to be to reduce the maximum water level of the reservoir or the plants can be transplanted above the high water line. Reducing the water level by 50 feet, as Dr. Stebbins proposes, would reduce the capacity of the reservoir by over 50% (based upon an Area Capacity Curve developed by the
engineering consultant to the Water District). A proposal to cut the capacity in half would probably mean the abandonment of the project. However, 50 feet appear to be the minimum reduction which will bring the water level down to where none of the rare plants will be drowned.

Most searches for other specimens of the rare plants have probably been made along roads and other accessible places. An intensive search of more remote spots might possibly turn up more specimens. The same survey could locate sites suitable for transplanting some of the bulbs which would be flooded. It is known that the bulbs can be transplanted if handled properly. A survey might also locate additional buckwheat and cypress stands.

An effort to identify additional stands of Brodiaea should take place between May 1 and June 15 when the plants are in flower. The bulbs should be dug up in July when they are dormant and the dried foliage is still in place to show the location of the bulb. Planting can be done any time in summer or fall.

The Water District could acquire the private lands upon which the plant rarities are found—the SH4W4 sec. 4, and the NW4SW4 sec. 9, T. 15 N., R. 6 W., M.D.N., and transfer them to Federal ownership.

The BLM should designate such transferred lands and any remaining BLM lands upon which these plants are located, and should manage them as "natural areas."

Lake County will have to relocate a road around the north end of the reservoir because parts of it will be inundated. It appears from the map that the most likely route would be through all three of the rarities. Unnecessary environmental damage should be avoided. This can be done if Lake County would consult with BLM on the location of the road and will respect its suggestions for protection of natural values.

Other impacts of the reservoir on BLM operations and lands are, briefly:

1. One-hundred eighty acres of public domain land will be inundated.

2. The access road to the damsite will cross public lands. About five and one-half miles of existing road and four miles of new or reconstructed road will be used.
3. We have not determined whether there are archaeological ruins in the area. It is our understanding that the National Park Service, Western Service Center, San Francisco, has already been contacted by the Sacramento Regional Office, Bureau of Reclamation, for an archaeological survey to be made.

Enclosure
Encl. 1 - Map
January 19, 1971

Mr. Paul J. F. Schumacher  
Chief Archaeologist  
Region 4, Regional Park Service  
450 Golden Gate Avenue, Box 36063  
San Francisco, California 94102

Dear Mr. Schumacher:

This letter is to confirm the telephone commitment made to your agency by our engineer, Mr. Joseph E. Patten, of Clair A. Hill and Associates, Redding, to the effect that our district has allocated funds in the amount of $4320.00 to pay your costs of an Archaeological reconnaissance survey of the lands involved in the district's Indian Valley Project. Mr. Patten will furnish you any maps and other data you may need.

We would appreciate having a report of your findings as soon as it is available, together with your estimate of salvage costs if these are deemed necessary.

Our warrant for survey expenses is now being processed and will be forwarded to you within the next few days.

Very truly yours,

/s/ C. M. Gordon

C. M. Gordon, Chairman  
Board of Directors

CMG/jd
ED REINECKE
Lieutenant Governor

March 5, 1971

Robert J. Pafford, Jr.
Regional Director
U.S. Bureau of Reclamation #2
2800 Cottage Way
Sacramento, California 95825

Dear Mr. Pafford:

Under current policy of the State of California all direct federal development Projects of the Bureau of Reclamation are reviewed and evaluated by the Resources Agency. That Agency is also responsible for the coordination of comments that generate from other State Agencies. The Resources Agencies responsibility for review excludes that of the Environmental Impact Statement.

Sincerely,

/s/ Mark E. Briggs

Mark E. Briggs
Assistant
Office of Intergovernmental Management
State Clearinghouse

MEB: jer

cc: Joe Patton-Consultant
Yolo District-U.S. Bureau of Reclamation
Mr. H. E. Horton  
Assistant Regional Director  
Regional Office, Region 2  
U. S. Bureau of Reclamation  
Department of the Interior  
2800 Cottage Way  
Sacramento, California 95825

Dear Mr. Horton:

This is in reply to your letter of March 3, 1971 requesting our comments on a draft of the environmental statement for the proposed Indian Valley project which is to be constructed by the Yolo County Flood Control and Water Conservation District under provisions of Public Law 984.

The statement was reviewed by the California State Departments of Water Resources, Fish and Game, Navigation and Ocean Development, Parks and Recreation, Public Health, and Conservation; and the State Water Resources Control Board and the State Reclamation Board. This letter summarizes the comments of these agencies.

The statement makes no mention of the fact that the project would create a 4,000-acre water surface that will provide a high potential for mosquito and midge production. The statement must indicate what provisions are being made by the District to control this potential problem.
It is recommended that a map of the project area be included in the report which would delineate access roads and indicate the location of the 300-acre reservoir-riparian land to be managed for wildlife.

On page 2, line 4, the first paragraph under "Environmental Impact" refers to wildlife enhancement. I would like to call your attention to our conclusion number seven in the State's comments of August 7, 1970 concerning this project. In the comments the State questioned whether the project would fully compensate for all wildlife losses let alone include any enhancement. We still are of the same opinion and suggest that the sentence mentioned above be modified accordingly.

Fire adversely affects the environment by adding to air and water pollution and also deprecates aesthetic experience. The statement makes no mention of the fact that this is a high fire hazard area. Past experience has shown that the risk of fires starting from project construction activity is multiplied many times over normal conditions. Whenever recreation is included as a project purpose, the additional people who utilize the recreation area also increase the risk of fire. Access and communications from existing fire suppression stations to the point of origin of fires may be adversely affected by the proposed project.

This area is presently protected from fire by the California Division of Forestry. In view of the potential detrimental environmental impact of fire on the area, it is recommended that a fire prevention plan to be developed by the Division of Forestry be considered an essential element of the project during the final design stage and that the costs of any material measures necessary to reduce fire risks during project construction and operation be assumed by the District. The statement must indicate the fire hazard problem and the intentions of the District in this matter.

The statement is not complete with regard to water quality. The discussion of the effect of reservoir storage and operation on downstream water quality is inadequate. The statement must present a proposed detailed operational plan of reservoir releases and the projected effect of such releases on downstream water quality.
Mr. H. E. Horton

It is suggested that the statement include a discussion of unresolved conflicts, or an indication that there are none, to develop an understanding concerning the extent of local support for the project.

Thank you for the opportunity to comment on this environmental statement.

Sincerely yours,

[Signature]

Assistant Secretary for Resources

cc: Mr. Joseph Patton
Clair A. Hill and Associates
P. O. Box 2088
Redding, California  96001

Mr. Charles M. Gordon, Chairman
Board of Directors
Yolo County Flood Control and Water Conservation District
P. O. Box 767
Woodland, California  95695
Dear Sir:

Reference is made to your letter of 3 March 1971, transmitting your draft environmental statement for the Indian Valley project on the North Fork of Cache Creek.

Some further clarification in regard to flood control storage and releases (second paragraph on page 2 of the statement) is recommended. Operation criteria for the Indian Valley project specifies that each year flood control storage space reservation should increase uniformly from zero acre-feet on 15 September to 40,000 acre-feet on 1 November. This space should be maintained until 15 March and then decreased uniformly to zero acre-feet on 1 June. Furthermore, project flood releases from the dam as high as 21,000 cubic feet per second would not normally be permitted as implied in the statement; rather, these releases would be coordinated with releases from Clear Lake and local inflow to limit flow in Cache Creek near Capay to 21,000 cubic feet per second, which is the channel capacity at that point.

Of further interest to you may be the fact that "white water" canoe enthusiasts presently use Cache Creek during the spring months when sufficient water is released from Clear Lake for them to pursue their sport. The minimum releases from Indian Valley as well as more substantial releases, if they can be appropriately scheduled, might be of benefit to these individuals.

We appreciate the opportunity to review this environmental statement.

Sincerely yours,

/s/ James H. Higman, LtC. CE

(for) JAMES C. DONOVAN
Colonel, CE
District Engineer
Mr. R. J. Pafford, Regional Director
U. S. Bureau of Reclamation, Region 2
U. S. Department of the Interior
2800 Cottage Way
Sacramento, California 95825

Dear Mr. Pafford:

This is in reply to your letter of March 3, 1971 requesting our technical assistance on the draft environmental statement for the proposed P. L. 984 Indian Valley Project.

The effect this project will have upon water quality is an important environmental concern. We are pleased to see that most of the water quality considerations suggested to you in earlier correspondence have been incorporated in this draft. In addition we would like to reiterate the following comment which was not included, that will have a definite adverse environmental effect.

1. Expanded agricultural development (13,500 acres) made possible by this project will increase the concentration of some constituents in the channels draining the service area, the Sacramento River, and in the Sacramento - San Joaquin Delta.

It is noted that the Flood Control and Water Conservation District is cognizant of threats of land development encroachment adjacent to and near the proposed reservoir. We concur with the other federal and state agencies that a strong management plan be implemented to cope with this problem.

We appreciate the opportunity to provide technical assistance on this project and look forward to reviewing other Bureau of Reclamation P. L. 984 projects.

Sincerely,

Interim Regional Coordinator
Memorandum

To: Commissioner of Reclamation
Through: Assistant Secretary for Fish and Wildlife and Parks

From: Director Office of Urban Programs & Environmental Policy

Subject: Draft Environmental Statement - Yolo County Flood Control and Water Conservation District

We have reviewed the subject statement which was enclosed with your memorandum of April 26, 1971.

We suggest that the statement indicate consultation with both the National Register of Historic Places, for possible historic values which could be affected by the project, and the State Liaison Officer responsible for State activities under the National Historic Preservation Act (P.L. 89-665). The State Liaison Officer of California (Director, Department of Parks and Recreation, State Resources Agency, Post Office Box 2330, Sacramento, California 95811) can advise whether or not there are any archaeological or historic sites in the area which may be nominated to the National Register of Historic Places.

It would be appropriate to include consideration of the project impact upon the aesthetic quality of the environment. The creation of the reservoir and the maintenance of continuous flows in the 13 mile downstream reach would have an effect which should be evaluated in terms of the enhancement of the visual quality of the environment.

[Signature]
Memorandum

To: Regional Director, Bureau of Reclamation, Sacramento, California

From: Assistant Director, Cooperative Programs, Western Region, National Park Service

Subject: Small Reclamation Projects Act Loan Application--Yolo County Flood Control and Water Conservation District

March 11, 1971

We appreciate the opportunity to review and comment on the environmental statement on the proposed Indian Valley Project.

We are glad to see that measures will be taken to save the stands of Brodiaea rosae that will be subject to inundation by transplanting them to suitable soils during their dormant cycles. The National Park Service's Archeological Research Division will keep in touch with the Bureau of Reclamation as work on archeological surveys of the project area progress.

I have no further comments at this time.

Theodore R. Owings
Memorandum

To: Commissioner, Bureau of Reclamation

From: Director, Bureau of Land Management

Subject: Draft Environmental Statement on an Application by the Yolo County Flood Control and Water Conservation District for a Loan and Grant Under the Small Reclamation Projects Act

We have reviewed the subject draft environmental statement and the comments provided to your Regional Director by our State Director, California. We have no further comments.

We appreciate being given an opportunity to review the environmental impacts of this proposed action.

[Signature]
Memorandum

To: Regional Director, Bureau of Reclamation
Sacramento, California

From: State Director, Bureau of Land Management
Sacramento, California

Subject: Small Reclamation Projects Act loan application--Yolo
County Flood Control and Water Conservation District--
P.L. 984 (Mr. H.E. Horton's March 3, 1971, request for
comments) -- Environmental Statement

We have reviewed your draft environmental statement on the unauthorized
Indian Valley Reservoir project prepared in accordance with Section
102(2) (c), of the National Environmental Policy Act of 1969, P.L. 91-190.

The following comments are submitted for your consideration. They do not
constitute the Bureau of Land Managements' formal comments under provisions
of P.L. 91-190.

Your environmental statement is reasonably accurate as it relates to the
public domain lands. Where public domain lands are involved, a right-of-way
permit, pursuant to 43 Code of Federal Regulations, Part 2234.3 (Act
of March 3, 1991, (26 Stat. 1101) will be required. Protective stipulations
for the orderly use, protection, and control of the public domain
lands will be made a part of the right-of-way permit. The following
comments are additional adverse impacts which should be elaborated on in
the Section entitled--Adverse Environmental Effects, beginning on page 3.

(1) No plans have been made for the management, maintenance or regulation
of the recreation use of the lake. Without adequate recreation and
sanitary facilities to provide for the estimated 50,000 annual rec-
creation visitor days of use, environmental problems could be created
on the adjoining public domain lands. Since no picnic or camping
facilities are planned at the reservoir, heavy use of unimproved
campsites along the main access road and along the lakeshore can be
expected. Besides the litter and garbage problems that can be expected
to develop, there will be health and sanitation problems, safety, as
well as increased fire hazard to the public domain and other lands
adjoining the reservoir.
(2) The environmental statement refers to subdivisions on private lands between the lake and public land. Such development would add to the problems named above. Environmental degradation resulting from recreational-urban type development on privately owned lands would not only adversely impact the public domain lands, but could seriously impact the waters of the lake. This would be due to the effect of sewage effluent from septic tanks enriching the lake with a consequent effect on plant and animal life. The lands lying between the reservoir and the public domain lands should be acquired in fee simple to preclude undesirable developments. Acquisition would avoid environmental costs in years to come.

(3) What is meant by "barren"? Indian Valley, together with adjoining hillsides provide important habitat for a variety of wildlife species and support many browse and forage species. The environmental statement should further define what is meant by use of this word, as well as recognize the wildlife habitat values.

(4) The plans specify that the water will be used to firm up the present water supply. This type of use would result in a fairly stable and high lake level with heavy draw downs only in dry years. However, in the event the reservoirs' use were changed from a supplementary water supplier to that of a primary supply source, a serious environmental impact would be created. Minimum pool (4,000 acre feet) would cover approximately 300 acres, resulting in a potential 3,700 acre mud or silt flat.

(5) The environmental statement presents insufficient information on wildlife mitigation plans. More information is needed on proposed mitigation projects to more fully determine the effect on the public domain.

Elaboration upon the above concerns in the text of your environmental statement would improve it. We appreciate having had the opportunity to review and comment on your draft environmental statement.
Memorandum

To: Commissioner of Reclamation

From: Director

Subject: Draft Environmental Statement, Small Reclamation Projects Act
Loan Application, Yolo County Flood Control and Water Conservation District, California

As you know from the copy of memorandum enclosed with your draft, our Regional Director, Portland, commented upon a draft statement to your Regional Director, Sacramento on March 15.

We have reviewed the draft statement submitted with your memorandum of April 26 and find it to be identical to the one reviewed by Regional Director Findlay. We consider Mr. Findlay's analysis quite adequate; and you may consider it as representing the Bureau of Sport Fisheries and Wildlife formal comments under P.L. 92-190. A copy of Mr. Findlay's comments are enclosed for ready reference.

We appreciate the opportunity to review the draft environmental statement.

Enclosure
March 15, 1971

To: Regional Director, Bureau of Reclamation
   Sacramento, California

From: Regional Director, Bureau of Sport Fisheries and Wildlife
       Portland, Oregon

Subject: Small Reclamation Projects Act loan applications—
Yolo County Flood Control and Water Conservation District—
P.L. 984 (Mr. H.E. Horton's March 3, 1971, request for comments) - Environmental Statement

We have reviewed your draft environmental statement on the unauthorized Indian Valley project prepared in accordance with Section 102(2)(c) of the National Environmental Policy Act of 1969, P.L. 91-190.

The following suggestions are submitted for your consideration and do not constitute our Bureau's formal comments under provisions of P.L. 91-190.

Pages 3, 4, 5, and 6, under the heading Adverse Environmental Effects, additional adverse environmental effects which should be elaborated on in this section include:

1. The effect that reregulation of streamflows and use of water for agricultural purposes would have on the ecology and environmental values of downstream areas including the Sacramento-San Joaquin Delta. Among the considerations should be the effect of agricultural return drains on water quality.

2. We disagree that the area to be inundated is generally barren. The area encompasses a rather broad basin which provides important habitat for a variety of birds and mammals. The environmental statement perhaps should indicate more precisely what is meant by "barren."

3. The draft environmental statement should indicate the potential threat of additional environmental degradation resulting from recreational-urban type development on privately owned lands lying between those acquired for project purposes and Federal lands. These lands lie in a narrow band around most of the reservoir area and will be more or less isolated from
points of access. Acquisition of these lands in fee title would preclude undesirable developments and avoid some of the (hidden) environmental costs generally associated with water development projects.

Elaboration upon the above concerns in the text of your statement would improve it significantly. We appreciate the opportunity to comment on the draft environmental statement.