TECHNICAL MEMORANDUM 10-1

Visual Quality on Federal Land

Yuba River Development Project
FERC Project No. 2246

July 2012

TECHNICAL MEMORANDUM 10-1

EXECUTIVE SUMMARY

In 2012, Yuba County Water Agency (YCWA or Licensee) conducted a visual quality assessment of its Yuba River Development Project (Project) facilities and features on federal land.

The only Project facilities and features on federal land that may have visual quality effects[1] occur on National Forest System (NFS) land, which occurs primarily upstream of New Bullards Bar Dam and at Our House and Log Cabin diversion dams.

YCWA used the United States Department of Agriculture, Forest Service's (Forest Service) Visual Management System (VMS). Field assessments were conducted by qualified specialists primarily by vehicle and on foot, as well as by boat for boat-in campgrounds. Digital photographs were taken from all key observation points (KOPs), which are critical viewpoints where the public can view Project facilities and features. Key visual information was noted and existing visual condition (EVC), a formal evaluation of how well a facility or feature blends with the surrounding landscape, was determined in the field using the Forest Service's EVC methodology. Photographs were taken in mid-May and early June 2012 and represented high pool reservoir conditions for New Bullards Bar Reservoir. For low pool conditions, YCWA collected representative photographs from YCWA archives.

While not specifically required by the Federal Energy Regulatory Commission (FERC)-approved study, YCWA also assessed the visual quality of Project facilities and features on land owned by YCWA. For ease of comparison and because the Forest Service's VMS is a robust assessment, YCWA used the VMS for Project facilities and features on land owned by YCWA.

Based on the EVC ratings, YCWA determined if each Project facility or feature on NFS land managed by the Plumas National Forest (PNF) is in compliance with visual direction in PNF's 1988 Land and Resource Management Plan (LRMP) (Forest Service-PNF 1988a), and if each Project facility or feature on NFS land managed by the Tahoe National Forest (TNF) is in compliance with visual direction in the TNF's 1990 LRMP (Forest Service-TNF 1990a). Both plans were developed after the Project was in place for at least 20 years. For facilities on YCWA land, YCWA determined if each Project facility or feature is in compliance with visual direction in TNF's LRMP even though the Forest Service's Visual Quality Objectives (VQOs) do not apply on private land.

On NFS land, all of the Project facilities and features meet the PNF's and TNF's LRMP visual direction with the exception of the land exposed by seasonal drawdown around New Bullards Bar Reservoir. The contrast increases as the reservoir is drawn down through the summer and fall. The broad band of exposed, mostly reddish soils with no plant growth and tree stumps is an

[1] A Project road, the Narrows 2 Powerhouse Intake and the Narrows 2 Power Tunnel are located on federal land managed by the United States Army, Corps of Engineers (USACE). However, the FERC-approved Visual Quality Study specifically excluded facilities on federal land managed by the USACE.

apparent visual feature to the public and most recreation users, and contrasts to the surrounding continuous native forest cover. The drawdown zone does not meet LRMPs visual direction, which is mostly Retention and Partial Retention VQOs. However, recreation users know to expect a significant drawdown to the reservoir over the summer and continue to recreate at the reservoir. For a multiple-use reservoir like New Bullards Bar, drawdown is an expected outcome from managing the reservoir.

On land owned by YCWA at New Bullards Bar Reservoir, the Emerald Cove Marina and moored houseboats do not meet visual direction due to visual contrast from the white and lightly colored docks, buildings, boats, and rental house boats. The visual contrast of these facilities is expected and is considered part of normal recreation management for a reservoir like New Bullards Bar Reservoir. In addition, New Bullards Bar Dam, which is visible from Sunset Vista Point and Bullards Bar Trail on NFS land, does not meet LRMP visual direction due to visual contrast.

The study was conducted according to the FERC-approved Visual Quality Study (Study 10.1); no variances occurred.

The study is complete.

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VISUAL QUALITY[2]

Yuba County Water Agency's (YCWA or Licensee) continued operation and maintenance (O&M) of the Yuba River Development Project, Federal Energy Regulatory Commission (FERC or Commission) Project Number 2246 (Project), may have an adverse effect on the visual quality of federal land.[3]

The only Project facilities and features on federal land that may have visual quality effects[4] occur on National Forest System (NFS) land, which occurs primarily upstream of New Bullards Bar Dam and at Our House and Log Cabin diversion dams. These NFS lands are managed by either the Plumas National Forest (PNF) or Tahoe National Forest (TNF), and are interspersed with irregular blocks of private land both large and small.

While not specifically required by the FERC-approved study, YCWA also assessed the visual quality of Project facilities and features surrounding New Bullards Bar Reservoir on land owned by YCWA.

1.0 Goal and Objectives

The goal of the study was to identify adverse visual quality effects on federal land due to continued O&M of the Project. The objectives of the study were to identify, map, and describe where Project facilities and features on NFS land managed by the PNF do not meet the visual direction in PNF's 1988 Land and Resource Management Plan (LRMP) (Forest Service-PNF 1988), and where Project facilities and features on NFS land managed by the TNF do not meet the visual direction in TNF's 1990 LRMP (Forest Service-TNF 1990).

2.0 Methods

The study was conducted in three steps: 1) define the study area; 2) gather information and perform mapping; and 3) perform visual quality assessment. Each of these steps is described below.

[2] This technical memorandum presents the results for Study 10.1, Visual Quality, which was included in YCWA's September 8, 2011 Revised Study Plan for relicensing of the Yuba River Development Project, and approved by FERC in its September 30, 2011 Study Plan Determination. There were no modifications to Study 10.1 subsequent to FERC's September 30, 2011 Study Determination.

[3] The Project Area lies within Yuba County except for Our House Diversion Dam on the Middle Yuba River, which is located in Sierra and Nevada counties. All three counties have planning goals to protect, preserve, or enhance scenic resources in their county plans. In addition, all three counties name specific roads or highways deserving of scenic protection of their viewsheds. The roads within the Project Area include State Highway 49 and County Road 8 (Marysville Road). The county plans do not include any specific visual assessment methodologies or criteria to determine whether scenic resources are being protected.

[4] A Project road, the Narrows 2 Powerhouse Intake and the Narrows 2 Power Tunnel are located on federal land managed by the United States Army, Corps of Engineers (USACE). However, the FERC-approved Visual Quality Study specifically excluded facilities on federal land managed by the USACE.

2.1 Study Area

The study area included the viewshed from which Project facilities and features on NFS land may be viewed by the public. The viewsheds include all the public travel routes, recreation areas, and reservoirs from which the public can view Project facilities and features, as well as the surrounding landscape, which is often beyond the FERC Project Boundary.[5] The viewsheds were identified by the United States Department of Agriculture, Forest Service (Forest Service) through formal planning processes that systematically inventoried all roads, trails, and use areas; assigned sensitivity levels; and mapped seen areas by distance zones. Table 2.1-1 lists all the routes and use areas that make up the study area viewshed, and the PNF's or TNF's, as applicable, designated sensitivity level for the viewshed. Attachment 10-1A displays on maps all roads, trails, and use areas that have views of Project facilities and features.

Table 2.1-1. Viewsheds tied to facilities for the Yuba River Development Project.

Viewshed Type	PNF's and TNF's Managed Viewsheds	TNF's and PNF's Sensitivity Level (Level of Importance)
State Highways, County Roads, Private Roads, and Forest Routes	State Route 49	Level 1
	County Route 8 (Marysville Road)	Level 1
	County Route 129 (Oregon Hill Road)	Level 1
	Moran Road	Level 1
	County Route 180 (Pliocene Ridge Road)	Level 1
	Access road to Log Cabin Diversion Dam (locked gate at the top of the road)	Level 3
	Access road to Our House Diversion Dam (locked gate at the bottom of road)	Level 3
	Access road to base of New Bullards Bar Dam (locked gate at top of the road)	Level 3
Trails	Bullards Bar Trail	Level 1
	Rebel Ridge Trail	Level 1
	7 Ball Trail	Level 1
	8 Ball Trail	Level 1
	School house Trail	Level I
Reservoir/ Impoundment	New Bullards Bar Reservoir	Level 1
	Our House Dam Impoundment (not open to boating)	Level 3
	Log Cabin Dam Impoundment (not open to boating)	Level 3
Rivers and Streams Developed Recreation Sites	North Yuba River	Level 1
	Middle Yuba River	Level 3
	Oregon Creek	Level 3
	New Bullards Bar Dam Overlook	Level 1
	Cottage Creek Boat Launch, Emerald Cove Marina, and General Store	Level 1
	Dark Day Boat Launch, Campground, and Picnic Ground	Level 1
	Garden Point Boat-in Campground	Level 1
	Hornswoggle Group Campground	Level 1
	Madrone Cove Boat-in Campground	Level 1
	School House Campground	Level 1
	Moran Road day use area	Level 1
	Vista Point Picnic Area and Trailhead (trailhead for Bullards Bar Trail)	Level I
	Frenchy Point Boat-in Campground (shoreline camping permit)	Level 1
	Burnt Bridge Campground (decommissioned)	Closed. Level 1 if open.

[5] The existing FERC Boundary for the Project is shown on existing Exhibit J and K maps.

2.2 Gather Information and Perform Mapping

In this step, YCWA performed the following general methods regardless of ownership of the land on which a Project facility or feature was located:

- Identified and mapped Sensitivity Level 1 and 2 routes and use areas.
- Identified and summarized the TNF's LRMP and PNF's LRMP direction associated with the Visual Management System (VMS) inventories relative to Project facilities on or near NFS land.
- Mapped and summarized the TNF and PNF Visual Quality Objectives (VQOs) in the study area.
- Summarized variety classes, sensitivity levels, distance zones, and Recreation Opportunity Spectrum (ROS) in table format.
- Summarized TNF's and PNF's Visual Direction and Inventory Information.

Each of these steps is described below.

2.2.1 Sensitivity Levels

The Forest Service uses sensitivity levels as a measure of people's concern for the scenic quality of public lands. The levels are defined as follows:

- Level 1 – Highest Sensitivity
- Level 2 – Average Sensitivity
- Level 3 – Lowest Sensitivity

Sensitivity levels are one of the components used to develop inventoried VQOs for the Forest Service. YCWA identified Sensitivity Level 1 and 2 routes for TNF and PNF by using VQO inventory maps (i.e., United States Geological Survey, or USGS, 7.5-minute quadrangle map copies of the inventory provided by TNF and PNF) that listed the distance zone, sensitivity level, and variety class components, along with the resulting VQO on mapped polygons. By looking at this mapped inventory data, YCWA identified the routes, use areas, and recreation areas by sensitivity level, which are shown in Table 2.1-1. Sensitivity Level 1 and 2 routes and use areas are displayed on maps in Attachment 10-1A. A summary of the Forest Service VMS is provided in Attachment 10-1C.[6]

[6] The Forest Service adopted a new system called the Scenery Management System which is not used in this document because all the inventory information and LRMP uses the older VMS system. A crosswalk for the new vocabulary for VQOs is provided in Attachment 10-1C.

2.2.2 Land and Resource Management Plan Direction

YCWA collected LRMP direction by management area and maps for VQOs from the TNF's LRMP and the PNF's LRMP.

2.2.3 Mapping Forest Service Visual Quality Objectives

YCWA collected TNF and PNF VQOs from TNF's and PNF's Geographic Information Systems (GIS) databases information and transferred to display maps (see Attachment 10-1A). Private lands did not have VQOs. However, within the TNF and PNF boundaries, the VQOs were sometimes displayed across private land for graphic simplicity. On some blocks of private land, the VQOs were not displayed. The VQOs do not apply to private land but they are used to evaluate Project facilities on private land for consistency in this technical memorandum.

2.2.4 TNF's and PNF's Variety Classes, Sensitivity Levels, and Distance Zones

The TNF's and PNF's variety classes, sensitivity levels, and distance zones were collected and summarized using TNF's and PNF's inventoried VQO maps. The seen area (i.e., the area that can be seen by the public) for distance zones (i.e., foreground, middle ground, and background) was mapped by the Forest Service using topographic information, but not vegetative screening. Therefore, these maps show many areas as seen from Sensitivity Level 1 and 2 routes and use areas.

However, in fact, many areas are screened from public view by forest trees. Therefore, YCWA visited in the field all Sensitivity Level 1 routes and use areas associated with Project facilities and features to determine if the facilities and features were viewed by the public and from what sensitivity level and distance zone. This information is displayed in Table 2.2-1. ROS is a Forest Service recreation land allocation tied to different levels of recreation development from primitive to highly developed settings and facilities. ROS information was collected from the TNF's LRMP Recreation Element, ROS forest-wide map dated 1989 (USFS-TNF 1990b) and PNF's LRMP Recreation Element, ROS forest-wide map (USFS-PNF 1988b).

Table 2.2-1. Inventoried and LRMP visual resource information by facility for the Yuba River Development Project.

Project Facility or Feature	Land Ownership	LRMP VQO[1]	Pre-Plan Inventoried VQO[2]	Seen Area and Sensitivity Level Inventory[3]	Recreation Opportunity Spectrum (ROS)[4]
OUR HOUSE DIVERSION DAM AND IMPOUNDMENT					
Our House Dam, Spillway and Impoundment[5]	NFS	M	PR	Mg2/A	RN
LOG CABIN DIVERSION DAM AND IMPOUNDMENT					
Log Cabin Dam, Spillway and Impoundment[6]	NFS	PR	PR	Mg1/B	RN

Table 2.2-1. (continued)

Project Facility or Feature	Land Ownership	LRMP VQO[1]	Pre-Plan Inventoried VQO[2]	Seen Area and Sensitivity Level Inventory[3]	Recreation Opportunity Spectrum (ROS)[4]
NEW BULLARDS BAR DAM AND RESERVOIR FACILITIES					
Madrone Cove Boat-in Campground	NFS	R	R	Fg1/B	RM
Frenchy Point Boat-in Campground Shoreline (camping permit)	NFS	R	R	Fg1/B	RN
Garden Point Boat-in Campground	NFS	R	R	Fg1/B	RN
Moran Road Day Use Site	YCWA/ NFS	R	R	Fg1/B	RN
Dark Day Campground and Boat Launch	NFS	R	R	Fg1B	RN
Burnt Bridge Campground (decommissioned)	NFS	R	R	Fg1/B	RN
School House Campground	NFS	R	R	Fg1/B	RN
Hornswoggle Group Campground	NFS	R	R	Fg1/B	RN
Bullards Bar Trail and Associated Trails[7]	YCWA/ NFS	R	R	Fg1/B	RN and R
Sunset Vista Point (includes a trailhead for Bullards Bar Trail)	NFS	R	R	Fg1/B	R
Cottage Creek Boat Launch	YCWA	PR	R	Fg1/B	RM/R
New Bullards Bar Dam Overlook[8]	YCWA	M	R	Fg1/B	R
New Bullards Bar Dam[8]	YCWA	• M on TNF • PR on PNF if it was on NFS land	R	Fg1/B	RM/R
New Bullards Bar Reservoir	YCWA/ NFS	• Primarily R • Some PR and M as the reservoir narrows towards the North Yuba River	• Primarily R • Some PR and M as the reservoir narrows towards the North Yuba River	Fg1/B	R/RM/RN

[1] VQOs: R = retention; PR = partial retention; M = modification.
[2] Inventoried VQOs: R = retention; PR = partial retention; M = modification.
[3] Inventory information/distance zones: Fg = foreground; Mg = middle ground; Bg = background.
Sensitivity levels: 1 = High concern for scenery; 2 = Moderate concern for scenery; 3 = Low Concern for scenery.
Variety classes: A = distinctive; B = common; C = minimal variety in landscape.
[4] R = rural; RM = roaded modified; RN = roaded natural; SPNM = semi-primitive non-motorized; SPM = semi-primitive motorized.
[5] Our House Diversion Dam Impoundment is not seen from any Sensitivity Level 1 or 2 roads or use areas.
[6] Log Cabin Dam and Impoundment is not seen from any Sensitivity Level 1 or 2 roads or use areas.
[7] Part of Bullards Bar Trail near the dam has a Rural ROS designation. The other associated trails include Schoolhouse Trail, 7 Ball Trail, and 8 Ball Trail.
[8] Both the Overlook and Dam are located on YCWA land and do not have VQOs or ROS designations. The VQO and ROS designations in this table are provided to allow a similar assessment of all facilities.

2.2.5 TNF's and PNF's Visual Direction and Inventory Information

Table 2.2-1 provides a detailed visual quality inventory and TNF's and PNF's LRMP VQO direction for areas associated with New Bullards Bar Reservoir. The inventory provides the building block information of distance zone, sensitivity level, and variety class that lead to the inventoried VQOs. Inventoried VQOs display the priorities for visual resources before other land management activities are considered through the Forest Service planning process. LRMP VQOs display the priorities for visual resources after land and resource management planning decisions have been made. In this table, the VQOs in most cases do not change; however, in

several instances, the VQO is lowered to recognize existing uses or to allow for active timber management. Examples include New Bullards Bar Dam, which is on land owned by YCWA, where the inventory VQO is Retention, yet the LRMP VQO is Modification or Partial Retention and Our House Diversion Dam where the inventory VQO was Partial Retention and the LRMP VQO is Modification. The Retention VQO provides for management activities which are not visually evident; whereas the Partial Retention VQO provides for management activities which remain visually subordinate to the characteristic landscape; and the Modification VQO provides for management activities which may visually dominate the original characteristic landscape.

The ROS documents the LRMP recreation allocations of Semi-Primitive Non-Motorized (SPNM), Semi-Primitive Motorized (SPM), Roaded Natural (RN), Roaded Modified (RM), and Rural (R) lands. R, RN, and RM are the only allocations in the study area. The TNF chose to use RN to include roaded modified conditions where as the PNF split out RN and RM conditions for their maps.

2.3 Perform Visual Quality Assessment

In this step, YCWA:

- Consulted with the Forest Service on Key Observation Points (KOP); described each KOP, including location using Global Positioning System (GPS) coordinates; and took photographs from each KOP.
- Assessed existing visual condition (EVC).

Each of these is described below.

2.3.1 Key Observation Points and Photo Points

Identifying KOPs was the first step in assessing the EVC of facilities and features. The approach was to identify the most critical viewpoints of Project facilities and features on federal land. In many instances where there was more than one road, trail, or use area, YCWA established multiple KOPs. In other instances, some roads could have many KOPs; and, in these instances, YCWA chose the most critical views to represent the multiple views.

Once YCWA identified a KOP, YCWA recorded GPS coordinates and photographs at each KOP. In some instances, one KOP provided critical views in more than one direction. In these cases, YCWA differentiated between multiple views and photographs in the EVC table by using letters (e.g., A, B and C). Of note, the maps in Attachment 10-1A only display the multiple views/photographs sites with a single KOP identification number (i.e., without the differentiating letters).

In addition, photo points (PP) were used to document Project facilities and recreation facilities, where there is very low public use or no views of facilities at New Bullards Bar Reservoir. The PPs are displayed on the maps in Attachment 10-1 A; and the photographs are provided in

Attachment 10-1 B. YCWA did not make an EVC assessment because of low public priority or no views of facilities.

2.3.2 Assess Visual Condition

EVC is the current state of the landscape, considering previous human alterations. Comparing the EVC of a facility in the landscape against the VQO for that area can indicate whether the VQO is being met. YCWA used the landscape analysis concepts documented in the *National Forest Landscape Management, Volume 1, Agriculture Handbook Number 434* (Forest Service 1973); as well as an assessment of the visual contrast of Project facilities as compared to the surrounding landscape. The following section provides a general description of how YCWA conducted the EVC assessment in the field and the EVC assessment process based on Forest Service guidelines.

2.3.2.1 General Approach

The EVC assessment established the existing visual condition of Project facilities as seen in the landscape from NFS managed viewsheds. For planning purposes, the TNF and PNF LRMPs use viewsheds as an organizing principle, which means considering the entire area observed from one roadway and then the next roadway or use area. For this study, the TNF and PNF approach would result in numerous overlaps and repetitive facility evaluations. Therefore, YCWA's approach was to consider one facility at a time and list the key roads and use areas that view that facility, and then move to the next facility.

The first step in the EVC assessment was to determine whether Project facilities or features could be seen from key roads, trails, or recreation use areas. YCWA accomplished this step by traveling on or to all key roads, trails, overlooks, and recreation areas. If a Project facility could be seen from Sensitivity Level 1 or 2 roads or use areas, the assessment described the degree of visual contrast created by Project facilities or features when seen from a road or use area in terms of form, line, color and texture, and duration and aspect of viewing. This assessment resulted in an EVC rating for each Project facility by KOP.

YCWA developed EVC ratings for each KOP. YCWA and the Forest Service agreed that YCWA would not calculate an overall rating or average rating based on several KOPs. This approach allows for more accurate ratings and an opportunity to better understand what mitigation measures may be effective or desired. For most Project facilities, YCWA identified multiple opportunities for KOPs from the same road and, in many cases, from multiple roads and recreation use areas. To arrive at a manageable and understandable number of KOPs, EVC ratings, and photographs, YCWA identified the most critical observer points for the EVC analysis. KOPs were established for foreground and middle ground views of New Bullards Bar Reservoir from recreation use areas to show the range of viewing experiences.

Before conducting EVC field visits, YCWA reviewed field atlas maps as well as TNF and PNF VMS inventory maps to identify key routes and use areas to visit and establish KOPs. YCWA conducted field visits on May 18, 2012 and June 10, 2012. Office analysis consisted of

reviewing atlas maps, the TNF and PNF recreation maps, TNF VMS maps, USGS 7.5-minute quadrangle maps, photographs, and field notes.

In addition to observing Project facilities and features from key routes and recreation use areas, YCWA visited each Project facility to understand the specific components and configuration of each, as well as to verify the facilities seen from KOPs. During these visits, YCWA recorded facility features and surrounding visual conditions and documented conditions with photographs.

YCWA visited New Bullards Bar Reservoir early in the water season. As a result, YCWA did not photograph or observe the drawdown of the reservoir in person. YCWA made estimates of the extent of drawdown during the summer season and how that drawdown would affect the EVC ratings. Historical photos of reservoir drawdown are provided in Attachment 10-1B to illustrate the typical visual effect.

YCWA agreed to use the Forest Service's VMS within the TNF and PNF boundaries, which includes lands in private ownership. While the majority of the land within the study area is NFS land, there are many parcels of private land and YCWA land that are concentrated around the shoreline of New Bullards Bar Reservoir. With this in mind, it is important to note that while the Forest Service VMS was used on YCWA land around Project facilities, the TNF and PNF VQOs do not apply to YCWA lands; nor does TNF and PNF have official LRMP maps depicting VQOs on these or any other private lands. In the EVC assessment table (Table 3.0-1), land ownership is listed specifically as a reminder that facilities are often on YCWA land and have different land management objectives.

The National Forest EVC assessment system is summarized in the next section.

2.3.2.1.1 National Forest Existing Visual Condition Assessments

EVC is another component of the VMS developed by the Forest Service after publication of the 1974 National Forest Landscape Management Handbook (Forest Service 1974) to assist the Forest Service in project-level and planning-level analysis. EVC is used by the Forest Service as an analysis tool for evaluating the visual effect of existing or proposed management activities. For this study, EVC is used primarily to determine the degree to which existing Project management activities and Project facilities are consistent with LRMP VQOs. YCWA's EVC assessment identified the EVC type for each Project facility as seen from established KOPs. For some of the Project facilities, YCWA established more than one KOP. Depending on the distances or the viewing angle, it is possible to have a different EVC type from one KOP to the next. Ultimately, YCWA used the most critical observer positions with the most critical EVC.

The EVC definitions are as follows (USFS 1974):

- Type I – Untouched. No visual evidence of past management activities. Portions of wilderness are examples of this condition.

- Type II – Changes Not Evident. Little or no visual evidence of past management activities. Areas in which changes in the landscape are not visually evident to the average person unless pointed out. These areas are unnoticed.
- Type III – Changes Evident, Natural Appearance Dominates. Some evidence of past management activities, but management activities are subordinate to the natural landscape. Areas where changes in the landscape are noticed by the average forest visitor, but they do not attract attention. The natural appearance of the landscape remains dominant. These areas appear to be minor disturbances.
- Type IV – Moderate Contrasts, Changes Are Obvious. Moderate evidence and management activities are somewhat subordinate to the natural landscape. Areas in which changes in the landscape are easily noticed by the average forest visitor and may attract some attention. These areas visually appear as disturbances but resemble larger natural patterns.
- Type V – Strong Contrasts. Moderate evidence and management activities generally dominate the landscape. Areas in which changes in the landscape are strong and would be obvious to the average forest visitor. These changes stand out as a dominating impression of the landscape, yet they are shaped so that they might resemble natural patterns when viewed from a distance of 3 to 5 miles or more. These areas visually appear to be major disturbances. This type is usually rated from middle ground or background.

Per the Forest Service VMS, the VQOs and EVCs were established for different purposes and have slightly different definitions, but the two terms can be displayed with the following correlations:

EVC	VQO
Type I	Preservation (P)
Type II	Retention (R)
Type III	Partial Retention (PR)
Type IV	Modification (M)
Type V	Maximum Modification (MM)

Using this correlation, an EVC rating of Type III means the facility is meeting a Partial Retention VQO from that KOP. In addition, an EVC rating of Type IV in an area with a Partial Retention VQO indicates that the landscape is not meeting the VQO, possibly due to a facility or management activity. See Attachment 10-1C (Summary of Visual Systems) for a summary of the Forest Service VMS.

3.0 Results

A general summary of the Project reservoirs and facilities is provided below. The summary includes a description of public access, opportunities for views, EVC ratings, and land ownership. Following the summary, a table provides detailed information. Table 3.0-1 lists the KOP, LRMP VQO, EVC rating, consistency with LMRP visual direction, and land ownership, followed by a section with a discussion and explanation. The discussion and explanation gives detailed information about distance zone, viewer position, view duration, and landscape factors

that led to the EVC rating. Photographs of the dams and other facilities taken from each of the KOPs and PPs are available in Attachment 10-1B. YCWA captured at least one photograph from each KOP and sometimes more than one photograph to capture all the facilities and typical shoreline. YCWA displayed the location of the KOPs and PPs on the maps in Attachment 10-1A, and provided a description of the KOP location in the discussion/explanation column in Table 3.0-1.

Table 3.0-1 Existing visual condition assessment of Our House Diversion Dam and Impoundment, Log Cabin Diversion Dam and Impoundment, and New Bullards Bar Dam and Reservoir.

Project Facilities Viewing Location	KOP or PP[1]	LRMP VQO[2]	EVC Rating[3]	Consistent with LRMP[4]	Land Ownership	Discussion and Explanation
OUR HOUSE DIVERSION DAM AND IMPOUNDMENT						
Our House Diversion Dam, Impoundment, and Diversion Tunnel	PP 1	M	Not applied (NA)	Yes, these views are from Sensitivity Level 3	NFS	The dam and impoundment are not seen from identified highways and recreation use areas due to their remote location deep in a canyon. Access is by a one-lane paved road down to the Middle Yuba River. Access to the dam is through a locked gate. However, the public may walk around the gate. Views at the site are foreground. The facilities meet the TNF VQO of Modification.
LOG CABIN DIVERSION DAM AND IMPOUNDMENT						
Log Cabin Diversion Dam	PP 2	R/PR	NA	Yes, these views are from Sensitivity Level 3	NFS	The dam and impoundment are not seen from identified highways and recreation use areas due to their location in a deep canyon. Access is by a two-lane paved road down to Oregon Creek. Access to the dam is through a locked gate. However, the public may walk around the gate approximately 0.6 mile down to Oregon Creek. Views at the site are foreground. The facilities meet the TNF VQOs because the facilities are not seen from any identified public roads or use areas. Both topographic and vegetative screening block views of this facility.
NEW BULLARDS BAR DAM AND RESERVOIR						
Madrone Cove Boat-In Campground	KOP 1	R	II to IV	Yes, except for drawdown impact	YCWA	New Bullards Bar Reservoir is seen in the foreground from a neutral viewer position from the Madrone Cove Boat-In Campground shoreline. View duration is long because campers occupy the campground overnight and have long periods available to view the reservoir. Views from the campground are to the north and northeast. At high water, the reservoir looks quite natural with no visual contrast visible. As the water level drops, visual contrast will start emerging and become a moderate and then strong contrast due to the reddish soils and total lack of vegetation compared to the surrounding native forest.
Frenchy Point Boat-In Campground	KOP 2	R	II to IV	Yes, except for drawdown impact	NFS	New Bullards Bar Reservoir is seen in the foreground from a superior viewer position from Frenchy Point Boat-In Campground. Views are partially screened by native forest vegetation. View duration is long because campers occupy the campground overnight and have long periods available to view the reservoir. Views from the campground are to the north, east, south and west due to the site being on a peninsula. At high water, the reservoir looks quite natural and there is no visual contrast visible. As the water level drops, visual contrast will start appearing and will become a moderate and then strong contrast due to the reddish soils and total lack of vegetation compared to the surrounding native forest.
Garden Point Boat-In Campground	KOP 3	R	II to IV	Yes, except for drawdown impact	NFS	New Bullards Bar Reservoir is seen in foreground from a neutral viewer position from Garden Point shoreline. View duration is long because campers occupy the campground overnight and have long periods available to view the reservoir from the shoreline. Views from the campground are to the southeast, south, and southwest. At high water, the reservoir looks quite natural and there is no visual contrast visible. As the water level drops, visual contrast will start appearing and will become a moderate and then strong contrast due to the reddish soils and total lack of vegetation compared to the surrounding native forest.

Table 3.0-1. (continued)

Project Facilities Viewing Location	KOP or PP[1]	LRMP VQO[2]	EVC Rating[3]	Consistent with LRMP[4]	Land Ownership	Discussion and Explanation
NEW BULLARDS BAR DAM AND RESERVOIR (continued)						
Moran Road Day Use Area	KOP 4	R	II to IV	Yes	YCWA	New Bullards Bar Reservoir is seen in the foreground from a neutral viewer position located at the terminus of Moran Road at the water's edge. The view from Moran Road is to the southeast. The view duration is long (minutes or longer) for recreation users launching their boats or using the road terminus as a day use site. At high pool, the reservoir looks very attractive and natural. Later in the summer, the drawdown leaves exposed banks of reddish soils and dead tree stumps. The visual contrast is high due to the strong visual contrast of the red clay banks and dead tree stumps compared to the native green forest. No major facilities are visible from this KOP. At high pool, one floating toilet building is just visible in the middle ground on the reservoir.
Dark Day Campground	KOP 5	R	II to IV	Yes, except for drawdown impact	NFS	New Bullards Bar Reservoir is seen in the foreground and middle ground from a partially screened superior viewer position located along the first parking area in the campground past the overflow boat launch parking area. Views of the reservoir are to the north and northwest. Views of New Bullards Bar Dam or Cottage Creek Marina do not exist because they are located over three miles to the southwest and blocked from view topographically. In the late spring with a full pool, the reservoir provides a natural look with no visual contrast. Later in the summer, the drawdown zone around the reservoir presents an area of high visual contrast. The predominately reddish clay soils and smooth textures are a strong visual contrast to the surrounding native green forest.
Dark Day Boat Launch	KOP 6	R	II to IV	Yes, except for drawdown impact	NFS	New Bullards Bar Reservoir is seen primarily in the foreground and some middle ground from a neutral viewer position located just above the courtesy dock at high water. The view of the reservoir is to the northeast and north. There are no views of New Bullards Bar Dam or Emerald Cove Marina because they are located over three miles to the southwest and blocked from view topographically. In the late spring with a full pool, the reservoir provides a natural look with no visual contrast. Later in the summer, the drawdown zone around the reservoir presents an area of high visual contrast. The predominately red clay soils and smooth textures are a strong visual contrast to the surrounding native green forest.
Sunset Vista Point and Bullards Bar Trailhead	KOP 7	M-TNF PR-PNF	IV	Yes, for TNF M-VQO No, for PNF PR-VQO	NFS	New Bullards Bar Dam and Reservoir is seen in the foreground from a superior viewer position located at a developed vista point. The view is framed by native forest vegetation. The view of the dam and reservoir is to the southwest. The view duration is long because forest visitors are invited to come to the vista point to enjoy the view. At high pool, the curved linear element of the dam and the bright orange log boom present enough visual contrast to be considered a Type IV EVC. In addition, the marina and moored houseboats all in light or white colors add to the visual contrast. Marysville Road beyond the dam and County Road 169 present linear elements and visible road cuts. Also visible from the vista point is a recent fire resulting in dead, dying and downed trees on the hillside above and downstream of the dam. Later in the summer, drawdown will increase the visual contrast from the exposed dam and the exposed shoreline.

Table 3.0-1. (continued)

Project Facilities Viewing Location	KOP or PP[1]	LRMP VQO[2]	EVC Rating[3]	Consistent with LRMP[4]	Land Ownership	Discussion and Explanation
NEW BULLARDS BAR DAM AND RESERVOIR (continued)						
Bullards Bar Trail	KOP 8	R for shoreline PR and M for dam	III to IV	Yes, for the reservoir and the dam	NFS and YCWA	New Bullards Bar Reservoir is seen in the foreground from a partially screened neutral viewer position located along Bullards Bar Trail. New Bullards Bar Dam is seen just beyond the foreground at the beginning of middle ground. The view from Bullards Bar Trail is to the southwest partially screened by vegetation. The view duration is long (minutes or longer) for recreation users hiking along the trail. There are several screened views along the trail. At high pool and middle ground, the dam is not that visible. The light to medium gray concrete presents some visual contrast to the water and surrounding green vegetation, but overall is considered low visual contrast. Emerald Cove Marina is also in middle ground and the light colors create some contrast but with vegetative screening and distance is also considered low visual contrast. Later in the summer, the drawdown exposes more of the concrete, smooth textured dam and may be considered a moderate visual contrast.
Cottage Creek Boat Launch	KOP 9	M-TNF PR-PNF	III to IV	Yes, for TNF M-VQO No, for PNF PR-VQO	YCWA	New Bullards Bar Dam is seen in foreground from a neutral viewer position located at the Cottage Creek boat launch turn around. The view from the boat launch is to the south. The view duration is long (minutes) for recreation users launching their boats or going to Emerald Cove Marina to rent a boat or purchase food and supplies. At high pool, the dam has little exposure (approximately 30 feet) and the color is medium to dark gray concrete. The visual contrast is moderate due to the straight line introduced at the top of the dam, the chain linked fence, and the straight uprights of the light poles. The gate lifting apparatus introduces additional geometric shapes but the uprights are painted a gray green that reduces contrast. The native forest green behind the dam provides visual contrast to the medium to dark gray of the dam. In the immediate foreground the bright orange floating booms and the light/white colors of the marina present strong visual contrast to the water and the generally green backdrop of the local forest. At the southwest end of the dam, the cut face of the rock with light gray colors and horizontal terracing presents low visual contrast due to the re-vegetation with native pines on the cut face. As the water level drops, the visual contrast of the dam will increase compared to the surrounding native forest green.
Cottage Creek Boat Launch Parking Area	KOP 10	M-TNF PR-PNF	III to IV	Yes, for TNF M-VQO No, for PNF PR-VQO	YCWA	New Bullards Bar Dam is seen in the foreground from a superior viewer position located at the Cottage Creek boat launch parking area. The view from the parking area is to the south. The view duration is long (minutes) for recreation users parking their cars and trailers. At high pool, the dam has little exposure (approximately 30 feet) and the color is medium to dark gray concrete. The visual contrast is moderate due to the straight line introduced at the top of the dam, the view of the top of the dam including Marysville Road, the chain linked fence, and the straight uprights of the light poles. The spillway gate apparatus introduces additional geometric shapes, but the uprights are painted a gray green that reduces contrast. The native forest green behind the dam sets up the visual contrast to the medium to dark gray of the dam. In the foreground, the bright orange floating booms and the light/white colors of the marina present strong visual contrast to the water and the generally green backdrop of the local forest. As the water level drops, the visual contrast of the dam increases significantly compared to the surrounding native forest green.

Table 3.0-1 (continued)

Project Facilities Viewing Location	KOP or PP[1]	LRMP VQO[2]	EVC Rating[3]	Consistent with LRMP[4]	Land Ownership	Discussion and Explanation
NEW BULLARDS BAR DAM AND RESERVOIR (continued)						
New Bullards Bar Dam Overlook	KOP 11	M	IV	Yes, for TNF-M	YCWA	New Bullards Bar Dam is seen in the immediate foreground from a slightly superior to neutral viewer position located at the edge of the dam on a vista point along Marysville Road. The view from Sunset Vista Point is to the north. The view duration is long (minutes) for motorists parking their cars and stopping to look at the dam. At full pool, around 30 feet of dam is exposed, but the light and medium gray concrete is in strong contrast to the water and surrounding native forest due to the size of the improvements and close proximity view. The white colors of the houseboats moored to the right of the dam also present visual contrast, but are of less consequence as seen in the middle ground. The bright orange booms also present strong visual contrast but are that color for safety purposes. With water level drawdown, the contrast would be even stronger.
Marysville Road Turn Out	KOP 12	PR-PNF M-TNF	IV	No, for PNF-PR Yes, for TNF-M	YCWA	New Bullards Bar Dam is seen in the foreground from a slightly superior to superior viewer position located at a road turnout along Marysville Road (County Road 8). The view from the turnout is to the northeast. This view is similar to views from Marysville Road. The view duration is long (minutes) for motorists parking their cars, but similar views from moving cars would be a few seconds. These views of the down stream side of the dam are fairly new due to a recent fire. In about 20 years, new trees will grow and block this view. Due to the height of the dam (645 feet), a large amount of light to medium gray concrete is seen from this observation point. This light color and straight line at the top of the dam is in strong contrast to the reservoir water and surrounding green native forest. The white colors of Emerald Cove Marina also present visual contrast but are of less consequence as seen in the middle ground.
Burnt Bridge Campground	PP 3	R	No view of reservoir (NA)	Yes	NFS	Burnt Bridge Campground has been closed for many years. No visual analysis was conducted because there are no views of the reservoir or facilities from this closed campground. One picture was taken from the campground loop closest to the reservoir to demonstrate the local views of vegetation and the lack of views of the reservoir.
Schoolhouse Campground	PP 4	R	No view of reservoir (NA)	Yes	NFS	Schoolhouse Campground provides overnight camping for families arranged with single camping spurs and is located adjacent to the reservoir. No visual analysis was conducted because there were no views of the reservoir or facilities from this campground. Dense forest vegetation blocks the view. One picture was taken from Campsite No. 23, the closest to the reservoir and facing the reservoir, to demonstrate the local views of vegetation and the lack of views of the reservoir. No EVC evaluation was conducted due to lack of views.
Parking Area for Sunset Vista Point and Bullards Bar Trailhead	PP 5	R/PR/M	No view of facilities or reservoir	Yes	NFS	Bullards Bar Trailhead users have no views of the dam or reservoir from the parking area. Dense forest vegetation blocks the views. No visual analysis was conducted because there were no views of the reservoir or facilities from this trailhead. One picture was taken from the trailhead facing the reservoir to demonstrate the local views of vegetation and the lack of views of the reservoir. See KOP 7, Sunset Vista Point, for views very close to this parking area.

[1] KOP: Key Observation Point or PP: Photo Point.
[2] LRMP VQO: Land and Resource Management Plan Visual Quality Objectives.
[3] EVC Rating: Existing Visual Condition rating. Forest Service EVC Type I through V.
[4] Refers to TNF's LRMP and answers yes or no.

3.1 Our House Diversion Dam

The main access to Our House Diversion Dam is from State Highway 49 via County Road 180 (Pliocene Ridge Road). Vehicle access involves traveling approximately 4.5 miles along County Road 180 and then turning onto Our House Dam Road, a single-lane paved road that leads to Our House Diversion Dam and Impoundment. Part way along the impoundment, motorized access to the Our House Diversion Dam is blocked by a locked gate. The public may walk around the gate and access the diversion dam by foot.

Our House Diversion Dam and Impoundment is only visible in the foreground from the access road. YCWA determined that the access road was a Sensitivity Level 3 route. Due to this low sensitivity rating, YCWA established a PP, but not a KOP. YCWA did not develop an EVC rating because of the Sensitivity Level 3 designation for the road and reservoir.

Our House Diversion Dam and Impoundment meet the Modification VQO. Land ownership is mixed between NFS land and private land along the access road and then becomes entirely NFS land around the diversion dam and impoundment.

TNF LRMP visual direction for the Our House Diversion Dam area is Partial Retention VQO for the immediate foreground along County Road 180 and middle ground as viewed from State Highway 49. The remainder of Management Area 024 (Oregon) is a Modification VQO.

3.2 Log Cabin Diversion Dam

The only access to Log Cabin Diversion Dam is from Log Cabin Road, a paved and gravel road approximately 0.6 mile long on YCWA land. The road has a locked gate along State Highway 49 just north of Marysville Road. The public may walk down the road and access the diversion dam and impoundment.

Log Cabin Diversion Dam and Impoundment is only visible in the foreground from the Log Cabin Road. YCWA determined this road to be a Sensitivity Level 3 route. Due to this low sensitivity rating, YCWA established a PP, but not a KOP. YCWA did not develop an EVC rating because of the Sensitivity Level 3 designation for the road and reservoir.

Log Cabin Diversion Dam and Impoundment meet the Retention and Partial Retention VQOs because the facilities are not visible from State Highway 49. Land ownership is mixed between NFS land and private land along the access road and then becomes entirely NFS land around the dam and impoundment.

TNF LRMP visual direction for the Log Cabin Diversion Dam area is split between two management areas that straddle Oregon Creek. Management Area 013 (Forty Niner) has a Retention VQO for the north side of the impoundment and Management Area 024 (Oregon) has a Partial Retention VQO for the middle ground as viewed from State Highway 49. The remainder of the Management Area 024 (Oregon) is a Modification VQO.

3.3 New Bullards Bar Reservoir

The main access to New Bullards Bar Reservoir is from County Road 8 (Marysville Road), which intersects State Highway 49 several miles to the west of the dam. Public access to the reservoir is primarily by boat launch facilities located at Dark Day and Cottage Creek boat launches. A third access point is County Road 163 (Moran Road), which can be accessed from County Road 8 by way of County Road 129 just west of New Bullards Bar Dam. County Road 163 access is several miles northwest of New Bullards Bar Dam. This access point receives a fair amount of use from nearby residents on County Road 163 and County Road 129.

New Bullards Bar Reservoir and Dam are seen directly from County Road 8 as it approaches and crosses the dam. Views of the dam exist from County Road 8 downstream of the dam for up to 0.75 mile. Glimpses of the reservoir exist from County Road 8 a few miles east of the dam.

New Bullards Bar Dam is also viewed in the foreground from the Dam Overlook, Cottage Creek Boat Launch and Emerald Cove Marina. Cottage Creek Campground is tucked away from the boat launch area and does not have direct views of the dam, but does have some views of the reservoir. Visitors who rent boats including houseboats also have foreground views of the dam.

There is a framed view of the dam and reservoir from Sunset Vista Point and a partially screened view of the dam and reservoir from Bullards Bar Trail just a short distance from the trailhead at Sunset Vista Point.

Further to the north, the views from Bullards Bar Trail are of the reservoir.

Other viewing opportunities are primarily of New Bullards Bar Reservoir from recreation facilities including Madrone Cove and Garden Point boat-in campgrounds, select campsites at Dark Day Campground, and at Moran Road Day Use Area.

Frenchy Point used to be a boat-in campground and is now used occasionally by shoreline campers with a permit; and visitors have views of the reservoir at select campsites.

Notably, Schoolhouse Campground and Hornswoggle Group Campground accessed off of Marysville Road do not have views of the reservoir.

Burnt Bridge Campground, closed for many years, if reopened would not have views of the reservoir.

In the immediate foreground, New Bullards Bar Dam and spillway has a Type IV EVC rating from the Dam Overlook site; and from downstream on County Road 8 at the beginning of middle ground the dam has a Type IV EVC rating. In the foreground from Cottage Creek Boat Launch, the dam has a Type III EVC rating at high water and Type IV rating as the water level drops. The Type IV ratings indicate that the dam is meeting the TNF Modification VQO for the area, but not the PNF Partial Retention VQO. Emerald Cove Marina structures, rental boats, and rental houseboats have a Type IV rating due to the light and white colors used on the boats and

marina structures. This visual contrast is recognized as part of recreation management on the reservoir and not expected to change. The reservoir shoreline has a Type II to IV rating, due to the significant drawdown of the water during the recreation season. As a result, early in the year, the high water meets the Retention and Partial Retention VQOs along the reservoir shoreline, but as the water level drops it no longer meets Retention VQO and eventually no longer meets the Partial Retention VQO. Land ownership is mixed between NFS land and YCWA land with some other private land beyond the immediate shoreline.

TNF and PNF LRMP visual direction are for primarily Retention VQOs with some Partial Retention VQOs in foreground views from the reservoir and recreation facilities; and Partial Retention VQO for the remainder of views from the reservoir. As the north arm of the reservoir narrows, some areas have a visual direction for Modification VQOs in foreground as seen from the reservoir. For the TNF, the visual management direction is located primarily in Management Area 034 (Bullards Bar), but also Management Area 013 (Forty Niner), Management Area 023 (Pendola), and Management Area 024 (Oregon). For the PNF, the visual direction is located in Management Area 011 (Challenge).

4.0 Discussion

No visual assessments of Project facilities occurred prior to this study. When the Forest Service developed inventoried VQOs in the 1970s, New Bullards Bar Reservoir was recognized as a major source of boating recreation and received a Sensitivity Level 1 rating, which helped generate inventoried Retention and Partial Retention VQOs. Subsequent LRMPs resulted in mostly Retention and Partial Retention VQOs around the reservoir. The two exceptions were a Modification VQO on the TNF or south side of New Bullards Bar Dam and the upper north arm of the reservoir. Since the LRMPs were approved, the main focus for VQOs has been whether timber management activities meet the standards set in the LRMPs. This study is the first time the Project facilities have been visually assessed and observations made as to whether the Project facilities meet LRMP standards. All Project facilities pre-date the TNF's and PNF's LRMPs.

4.1 General Observations

The study covered facilities in a wide range of viewing situations and settings. Some qualitative observations about which Project facilities and features had higher or lower EVC ratings and why, by type of facilities, are listed below.

4.1.1 Dams

New Bullards Bar Dam is a large dam (i.e., 645 feet high) and resulted in strong visual contrast as seen from the downstream side of the dam. From the reservoir side, visual contrast is moderate to strong depending on the level of the water. Strong and moderate visual contrast resulted in EVC ratings of IV which matched with a Modification VQO.

YCWA did not give the Our House and Log Cabin diversion dams an EVC rating because they were not seen from a Sensitivity Level 1 or 2 road, trail, or use area. Since these facilities are

only seen from their Sensitivity Level 3 access roads, both facilities meet the Retention, Partial Retention, and Modification VQOs prescribed for these areas.

4.1.2 Reservoir Shorelines

New Bullards Bar Reservoir is considered to be a major visual asset to the Forest Service. During the recreation season, the reservoir shoreline starts out looking like a natural shoreline, but as the water level drops the exposed red clay soils create a strong visual contrast against the native forest vegetation. The changing water levels result in EVC ratings from II to IV, which is equivalent to a Retention VQO down to a Modification VQO. While rated low due to strong visual contrast along the shoreline due to drawdown, the reservoir still maintains a broader visual attraction due to the remaining water and surrounding scenery of native forests and mountainous landscape. In late summer, recreational users of the reservoir know to expect a significant drawdown around the reservoir. The more gentle slopes in this zone are used for day use and some camping.

The Our House and Log Cabin diversion dam impoundments are fairly small, do not receive significant recreation use, and the drawdown is not a significant consideration. Since these features are only seen from their Sensitivity Level 3 access roads, both features meet the Retention, Partial Retention, and Modification VQOs prescribed for these areas.

4.1.3 Powerhouses

Only one powerhouse, New Bullards Minimum Flow Powerhouse, lies within the study area at the base of New Bullards Bar Dam. Due to the small size of the powerhouse, the significant height of the dam (645 feet), and the limited viewing opportunities to look down to the base of the dam, YCWA did not evaluate the powerhouse separately, but considered it part of the dam facility (refer to Section 4.1.1).

4.1.4 Recreation Facilities

The Emerald Cove Marina and the houseboat moorings, all on YCWA-owned land, introduce strong visual contrast at the southern end of New Bullards Bar Reservoir opposite Cottage Creek Boat Launch. This strong visual contrast results in Type IV EVC ratings from KOPs viewing these facilities. The light colored docks and buildings of the marina, as well as the boats moored at the marina, present a strong contrast to the water and the surrounding green native forest. The rental houseboat moorings create the same strong visual contrast due to the mostly white or light colors of the houseboats. Both the Emerald Cove Marina structures and the houseboat mooring areas are part of the recreation program on New Bullards Bar Reservoir and are part of the expected visual environment.

The campgrounds, vista point, picnic area, boat launching facilities, and trails all blend well into the surrounding native forest as seen from outside the facilities. Within the facilities at the immediate foreground viewing, cars, tents, campers, and recreational vehicles present strong visual contrast but are part of the expected recreation visual environment.

4.1.5 Tunnels

YCWA did not conduct visual assessments of the three tunnels within the study area (Lohman Ridge Diversion Tunnel, Camptonville Diversion Tunnel, and New Colgate Power Tunnel) because the facilities are underground and, therefore, are not visible to the public.

4.1.6 Storage Gages and Flow Gages

YCWA did not conduct visual assessments specifically for storage gages, flow gages, and associated buildings. This was primarily due to the fact that the gages are located in areas not readily visible to the recreating public.

5.0 Study-Specific Collaboration and Consultation

The FERC-approved study required two study-specific consultations with the Forest Service. Each of these is described below.

5.1 Consult with Forest Service Regarding Sensitivity Levels 1 and 2

The FERC-approved study required:

> In coordination with the Forest Service, identify and map all Sensitivity Level 1 and 2 viewsheds in the study area, associated with existing Project facilities identified in Step 1.

Collecting inventory information was one of the first steps in preparing to assess the EVC of the Project's facilities and features. YCWA consulted with the TNF in April 2012, which included meeting with the TNF's forest landscape architect, confirming possible KOPs and discussing sensitivity levels (W. Davis, pers. comm., 2012a). In a subsequent meeting the next week, all relevant visual inventory maps and data were provided to YCWA (W. Davis, pers. comm., 2012b). For the PNF, YCWA consulted with the landscape architect in May and June 2012 to collect all relevant visual inventory maps and data (D. Schoenberg, pers. Comm., 2012). In all, YCWA received inventory maps displaying distance zone, sensitivity level, variety class, and VQO, which YCWA used to identify the roads, trails, and use areas that generated these viewsheds. All the Sensitivity Level 1 and 2 routes and use areas that provided views of Project features and facilities are displayed on maps provided in Attachment 10-1A. A few select Sensitivity Level 3 roads that provided access to remote reservoirs are also shown on these maps.

5.2 Consult with Forest Service Regarding KOPs and Photographic Protocols

The FERC-approved study required:

> In consultation with the Forest Service, identify key observation points (KOPs) where photographs will be taken based on the list of Project facilities identified in

Step 1 using agreed upon photographic protocols. Map and describe the location of the KOPs.

Identifying KOPs was the first step in assessing the EVC of YCWA's facilities and features. Initial consultation with the TNF involved meeting with the TNF's forest landscape architect on April 6, 2012, and discussing possible KOPs over a set of maps, as well as the methodology for GPS and taking photographs. Previous to this meeting, a list of possible KOPs was established in the Study. The forest landscape architect was invited to attend a field meeting on May 18, 2012, that established KOPs, took photos, and completed visual assessments. However, the forest landscape architect was not able to attend. In addition, YCWA converted some KOPs to PPs because the sites had no views of facilities, or the views were from roads with a Sensitivity Level 3 rating.

6.0 Variances from FERC-Approved Study

The study was performed in conformance to Study 10.1, Visual Quality, which was filed with FERC in a revised study plan letter from YCWA dated August 17, 2011, and that was subsequently included in FERC's Determination in a letter from FERC dated September 30, 2011. No variances to the study occurred.

7.0 Attachments to this Technical Memorandum

This Technical Memorandum includes three attachments:

- Attachment 10-1A Maps of Forest Service Visual Quality Objectives and Key Observation Points. [1 Adobe pdf file: 9.7 MB; 6 pages formatted to print on 8-½ by 11 inch paper and 7 pages formatted to print on 11 by 17 inch paper]
- Attachment 10-1B Photographs of Project Reservoirs and Facilities. [1 Adobe pdf file: 4 MB; 18 pages formatted to print on 8-½ by 11 inch paper]
- Attachment 10-1C Summary of Forest Service Visual Management System. [1 Adobe pdf file: 1 MB; 12 pages formatted to print on 8-½ by 11 inch paper]

8.0 References Cited

Davis, W. Landscape Architect. 2012a. United States Department of Agriculture, Forest Service, Tahoe National Forest (Forest Service-TNF). Personal communication. Met with Philip Horning, Landscape Architect, HDR, at the Supervisor's Office, Nevada City, California to discuss approach to EVC assessment and general approach to KOPs and recommended locations. April 2012.

Davis, W. Landscape Architect. 2012b. United States Department of Agriculture, Forest Service, Tahoe National Forest (Forest Service-TNF). Personal communication. Met at Supervisor's Office and provided copies to Philip Horning, Landscape Architect, HDR, of 7.5-minute quad sheets that displayed inventoried Visual Quality Objectives and copies of relevant Management Areas with LRMP direction. April 2012.

Schoenberg, D. 2012. Public Services Staff, Landscape Architect, Feather River Ranger District, Plumas National Forest, Oroville, CA. Personal communication. Philip Horning, Landscape Architect, HDR, sent an e-mail to Deb Schoenberg indicating an interest in obtaining inventory VQO maps and Forest Plan VQOs. This was followed by back and forth e-mails that resulted in copies of the Plumas NF inventoried VQO maps and information on how to request GIS maps from the Supervisor's Office for LRMP VQO maps. May 2012.

United States Department of Agriculture, Forest Service (Forest Service). 1973. National Forest Landscape Management, Volume 1. Agricultural Handbook Number 434.

_____. 1974. National Forest Landscape Management, Volume 2. Chapter 1, The Visual Management System. Agricultural Handbook Number 462.

United States Department of Agriculture, Forest Service, Plumas National Forest (Forest Service-PNF). 1988. Plumas National Forest Land and Resource Management Plan. USDA Forest Service, Pacific Southwest Region, San Francisco, CA. URL: <www.fs.fed.us/ r5/rsl/clearinghouse/gis-download.shtml>.

United States Department of Agriculture, Forest Service, Tahoe National Forest (Forest Service-TNF). 1990. Tahoe National Forest Land and Resource Management Plan. USDA Forest Service, Pacific Southwest Region, San Francisco, CA. URL: <www.fs.fed.us/ r5/rsl/clearinghouse/gis-download.shtml>.

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Technical Memorandum 10-1

Visual Quality

Attachment 10-1A

Maps of Forest Service Visual Quality Objectives and Key Observation Points

Yuba River Development Project

FERC Project No. 2246

July 2012

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ATTACHMENT 10-1A

MAPS OF FOREST SERVICE VISUAL QUALITY OBJECTIVES AND KEY OBSERVATION POINTS

1.0 Guide To Reading Maps

The overview map, Figure 1, shows the overall location of Yuba River Development Project (Project) reservoirs and the general location of Key Observation Points (KOP) and Photo Points (PP). Figures 2 through 8 display the following information:

- Forest Service Visual Resource Objectives as directed in the Plumas National Forest and Tahoe National Forest Land and Resource Management Plans: **Modification** Visual Quality Objective (VQO) is brown and management activities may visually dominate the original characteristic landscape. **Partial Retention** VQO is yellow and management activities remain visually subordinate to the characteristic landscape. **Retention** VQO is orange and management activities are expected to not be visually evident.

- KOP and PP locations are displayed on the maps based on GPS coordinates for the KOPs and from known map locations for the PPs. Specific viewing information is available in Technical Memorandum 10-1, Visual Quality on Federal Land, within Table 3.0-1. Both the KOPs and PPs are displayed on the maps by number.

- The Sensitivity Level 1 and 2 roads and recreation use areas are shown on the maps and labeled with names or numbers for roads and names of recreation sites.

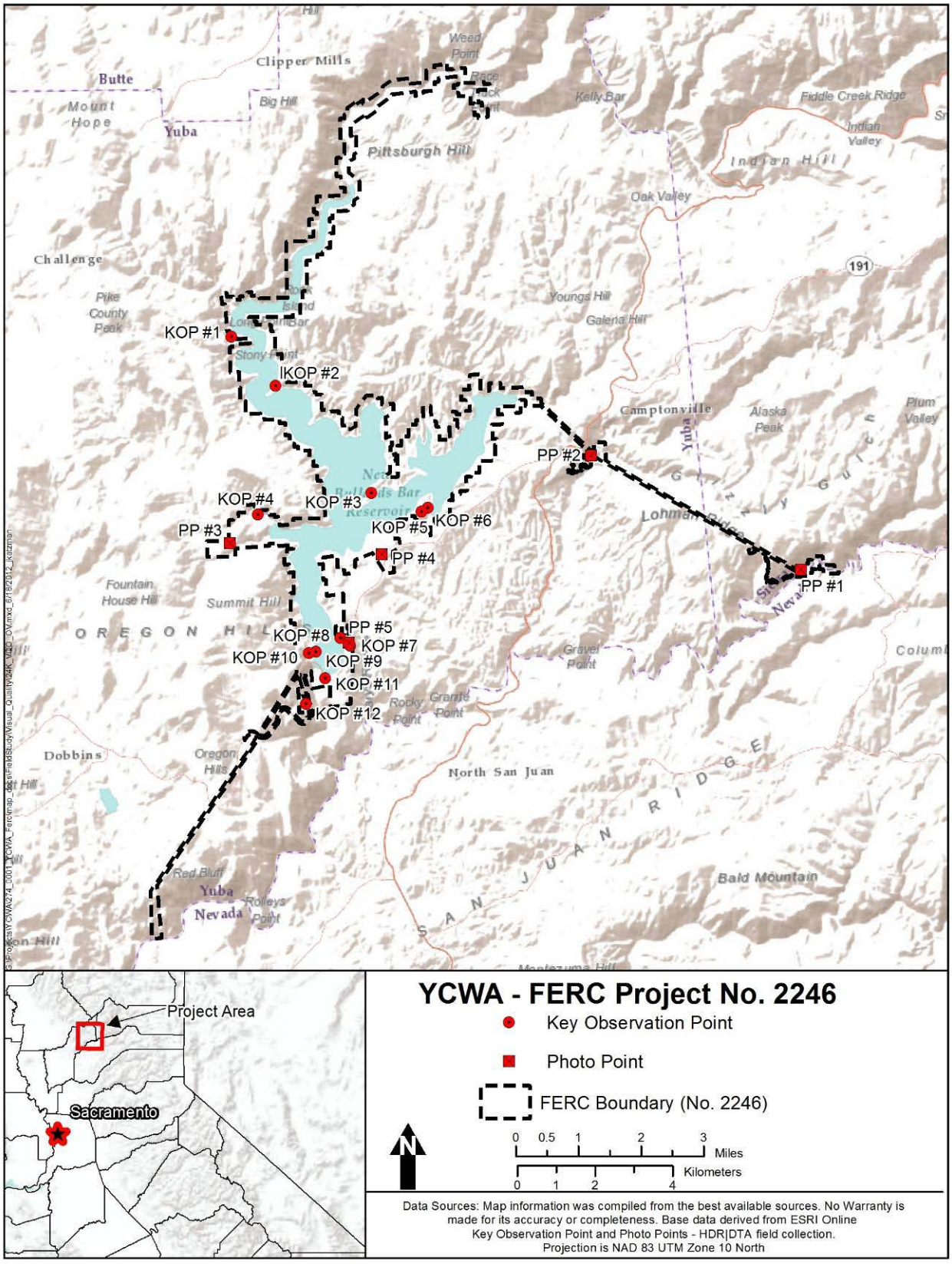

Figure 1. Overview map showing location of Project, KOPs and PPs.

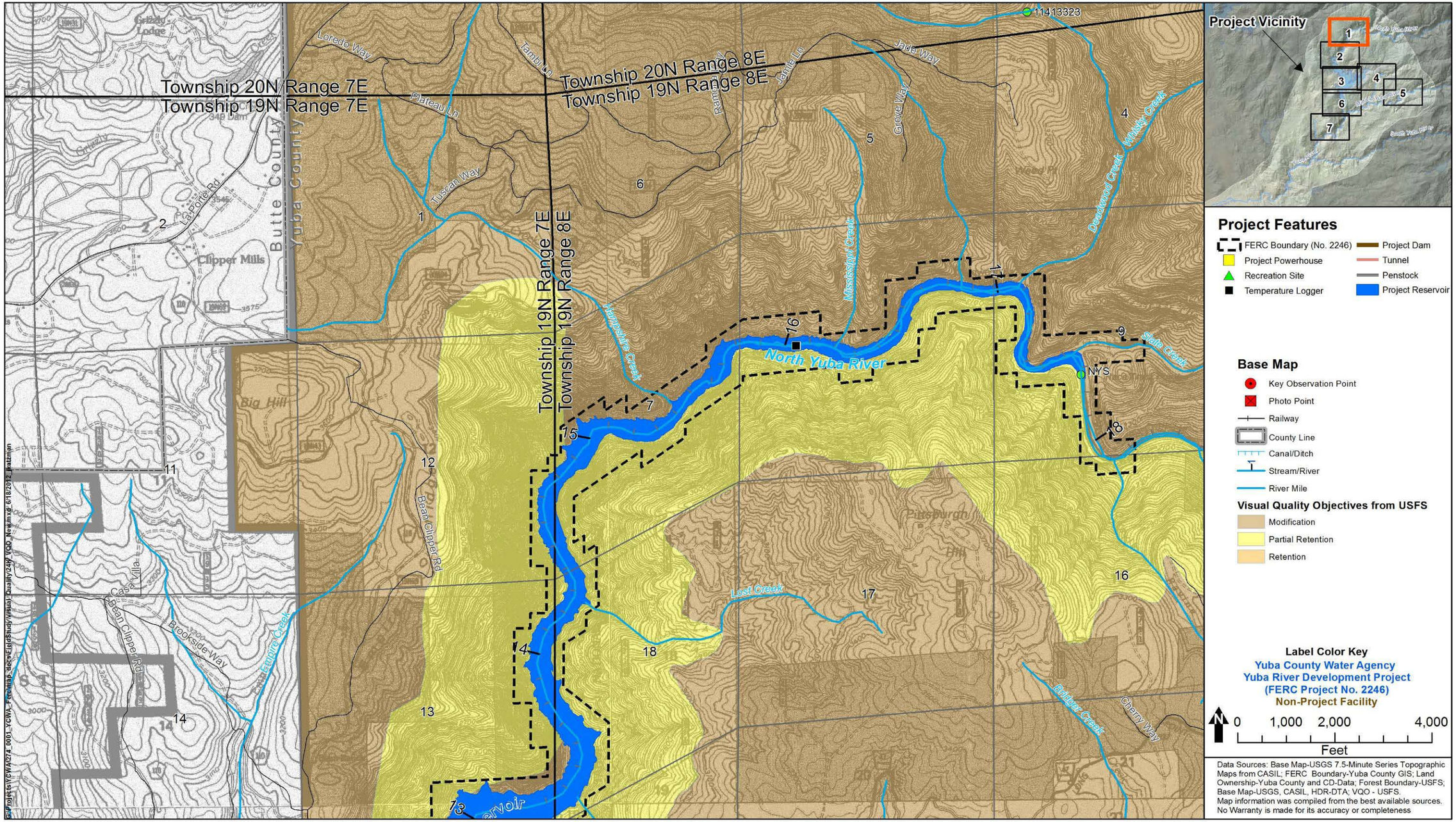

Figure 2. Upper Bullards Bar Reservoir. No KOPs or PPs are located on this map.

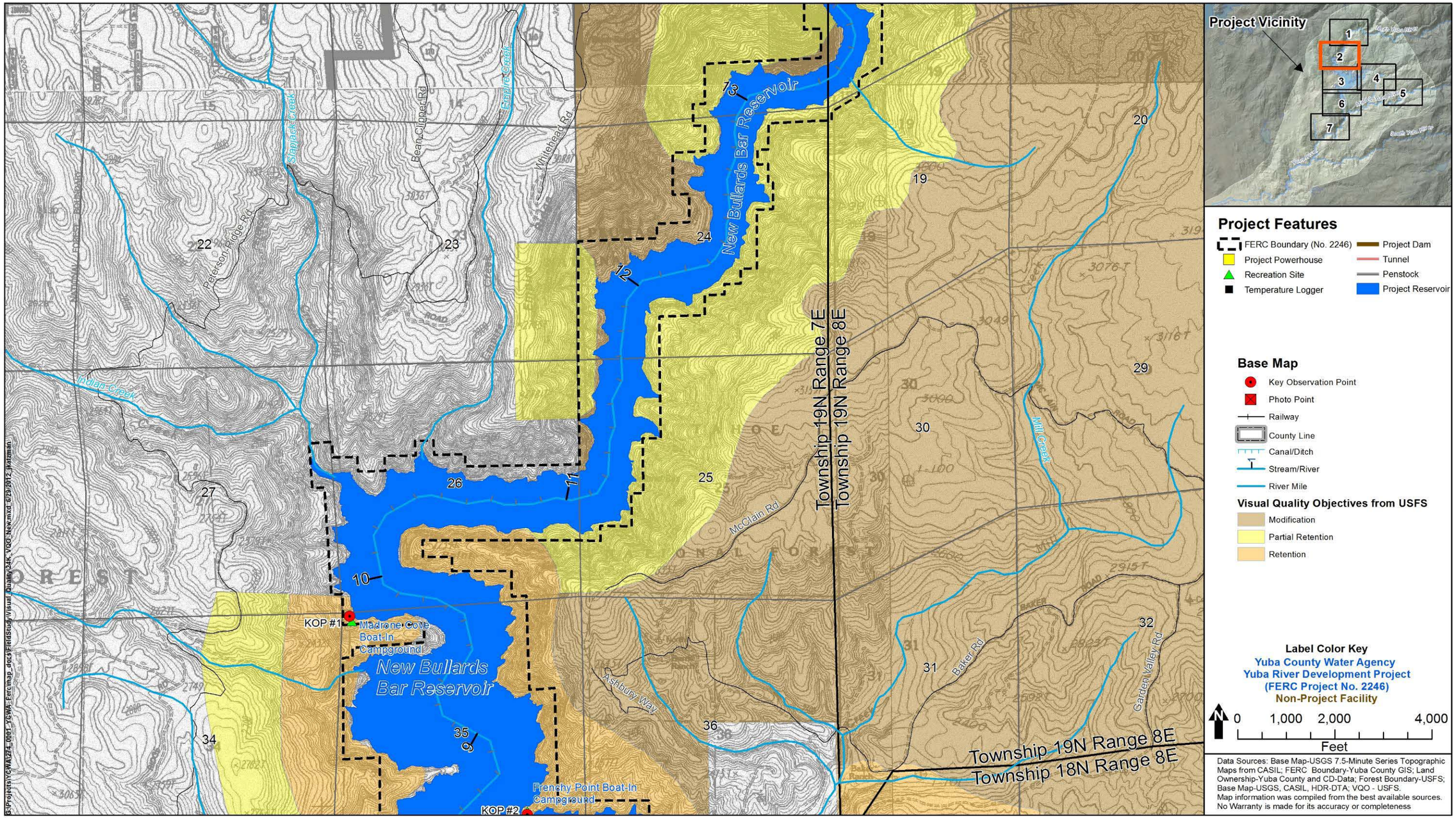

Figure 3. Middle part of the north arm of New Bullards Bar Reservoir.

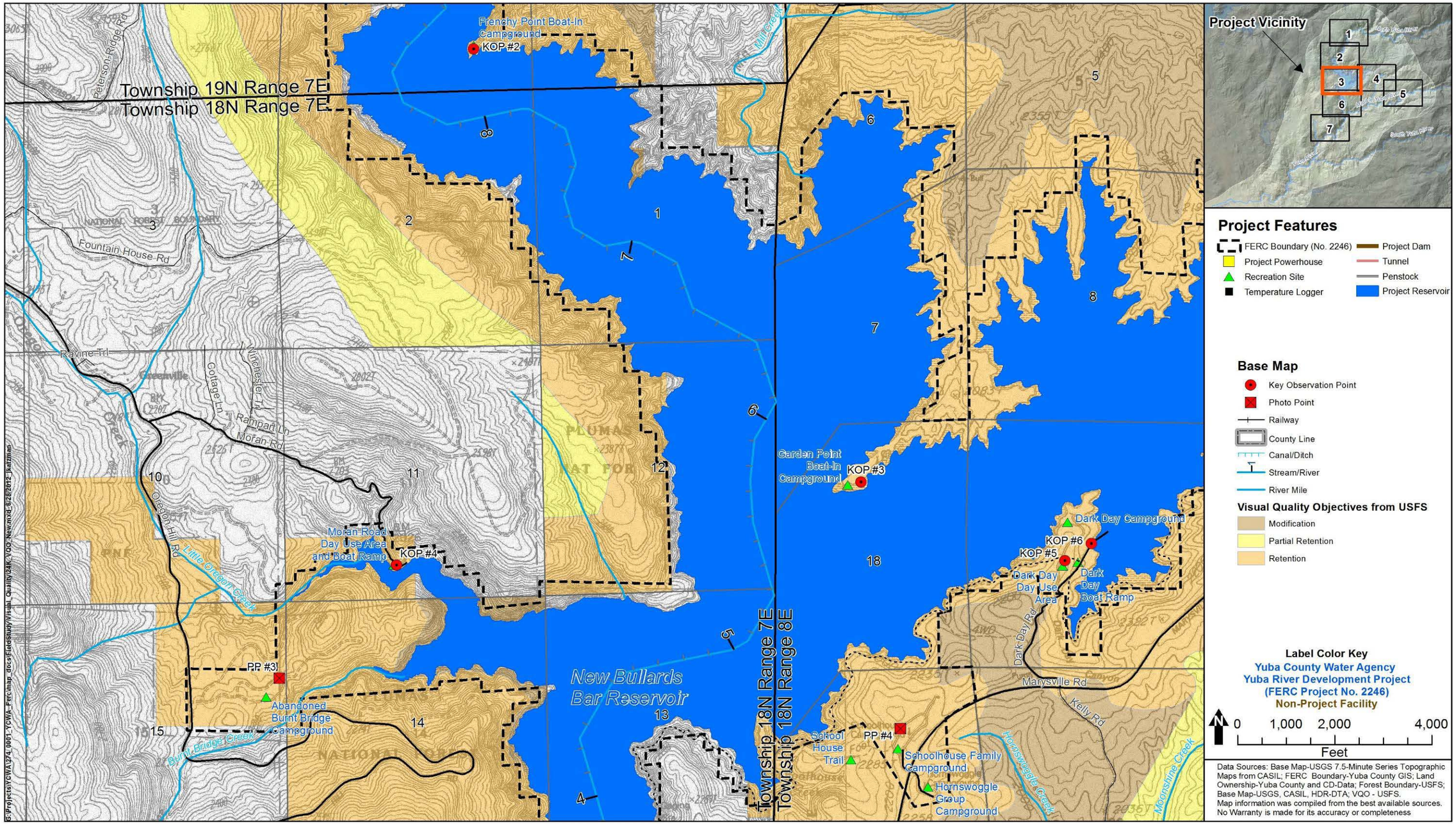

Figure 4. Central Part of New Bullards Bar Reservoir.

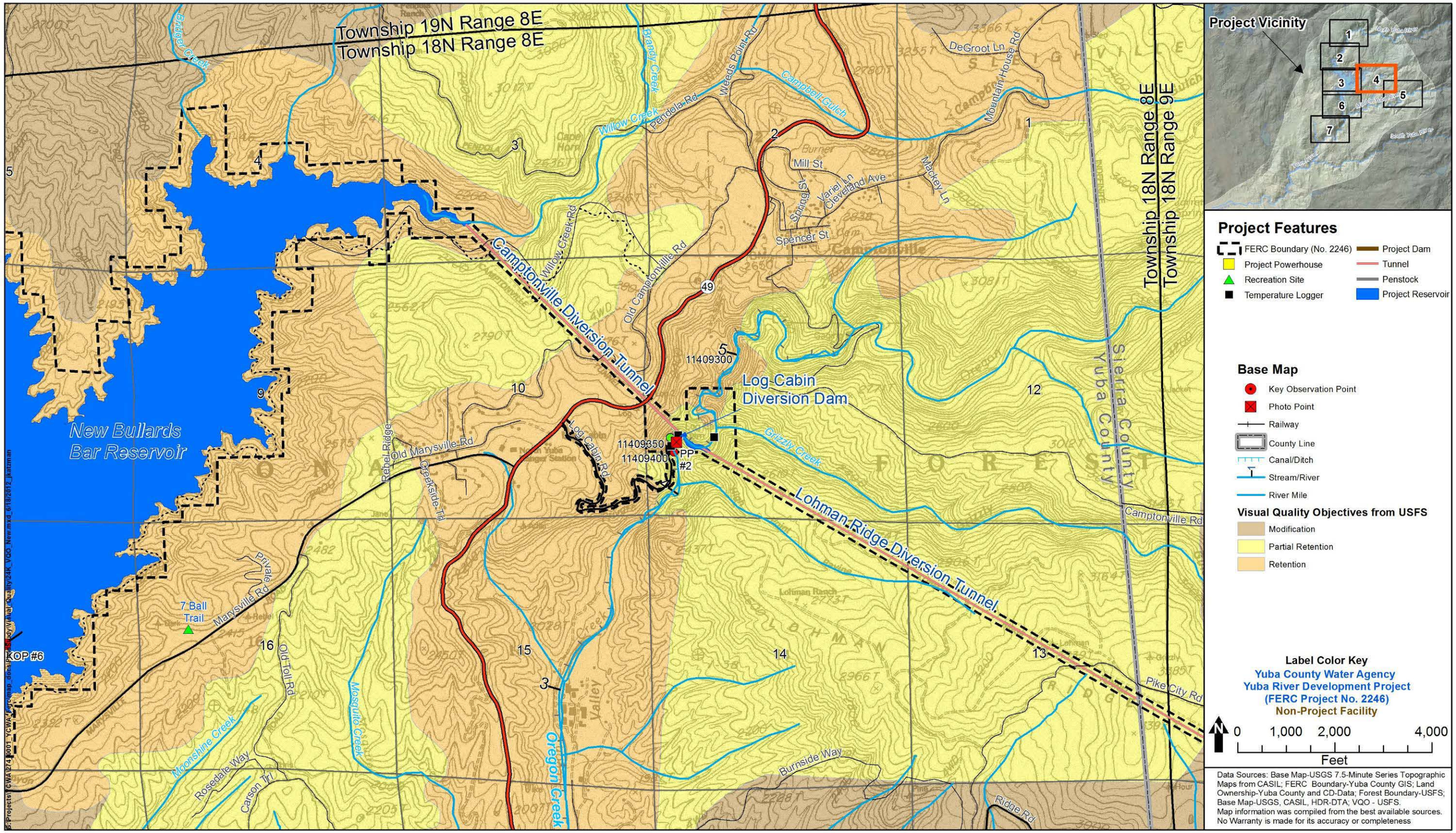

Figure 5. Eastern arm of New Bullards Bar Reservoir and Log Cabin Diversion Dam.

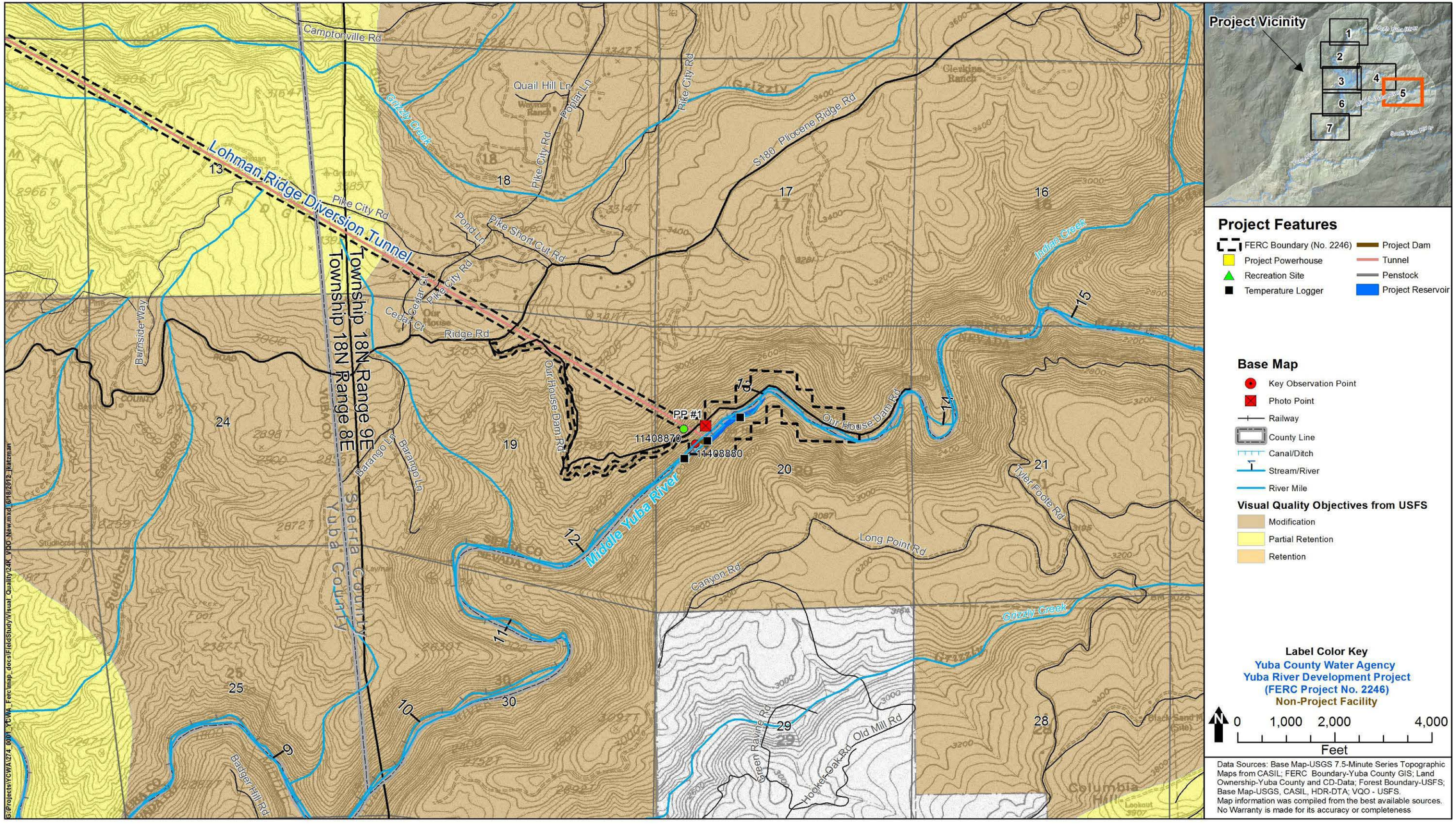

Figure 6. Our House Dam Area including the Middle Yuba River.

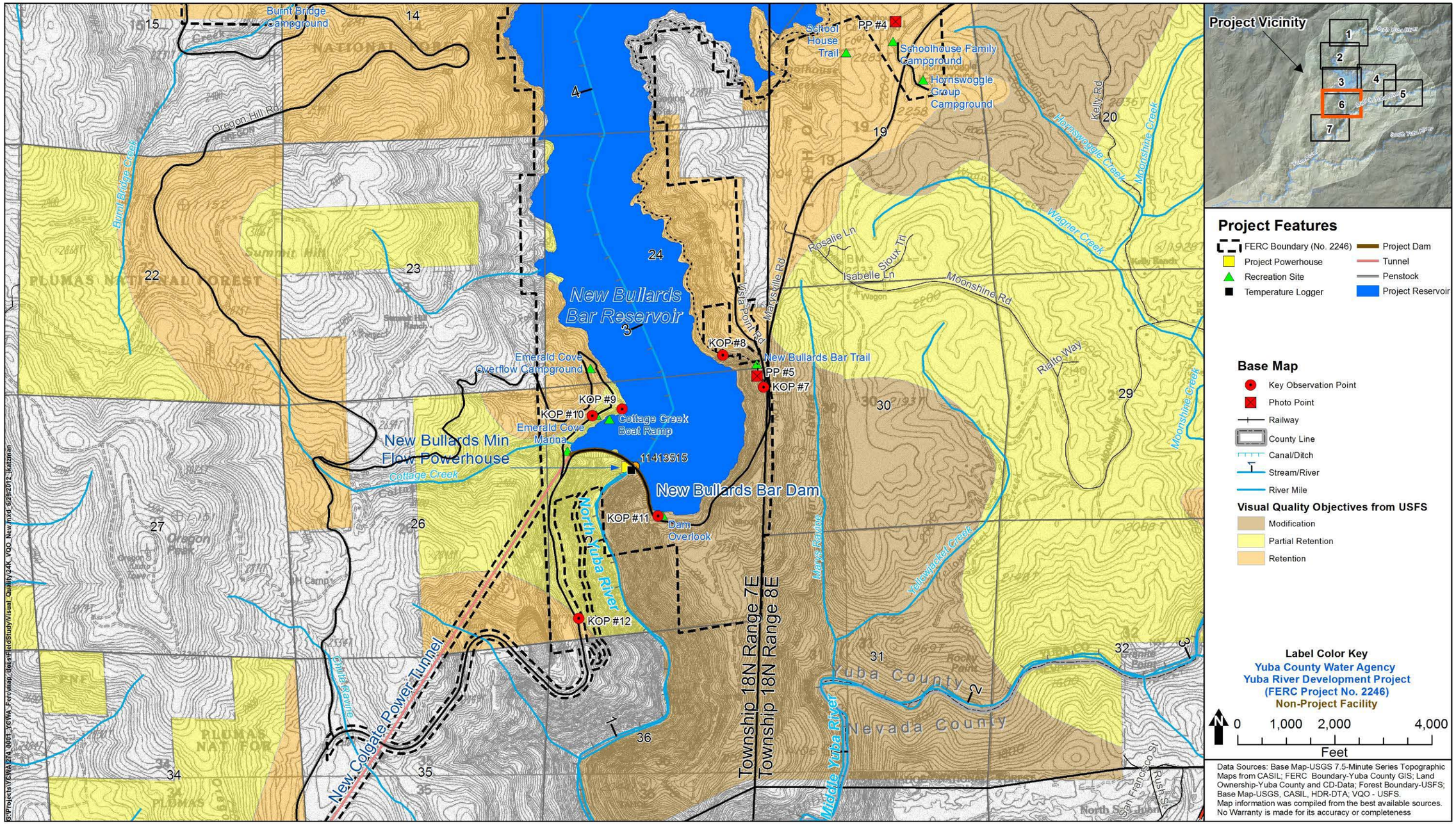

Figure 7. Lower part of New Bullards Bar Reservoir and Dam.

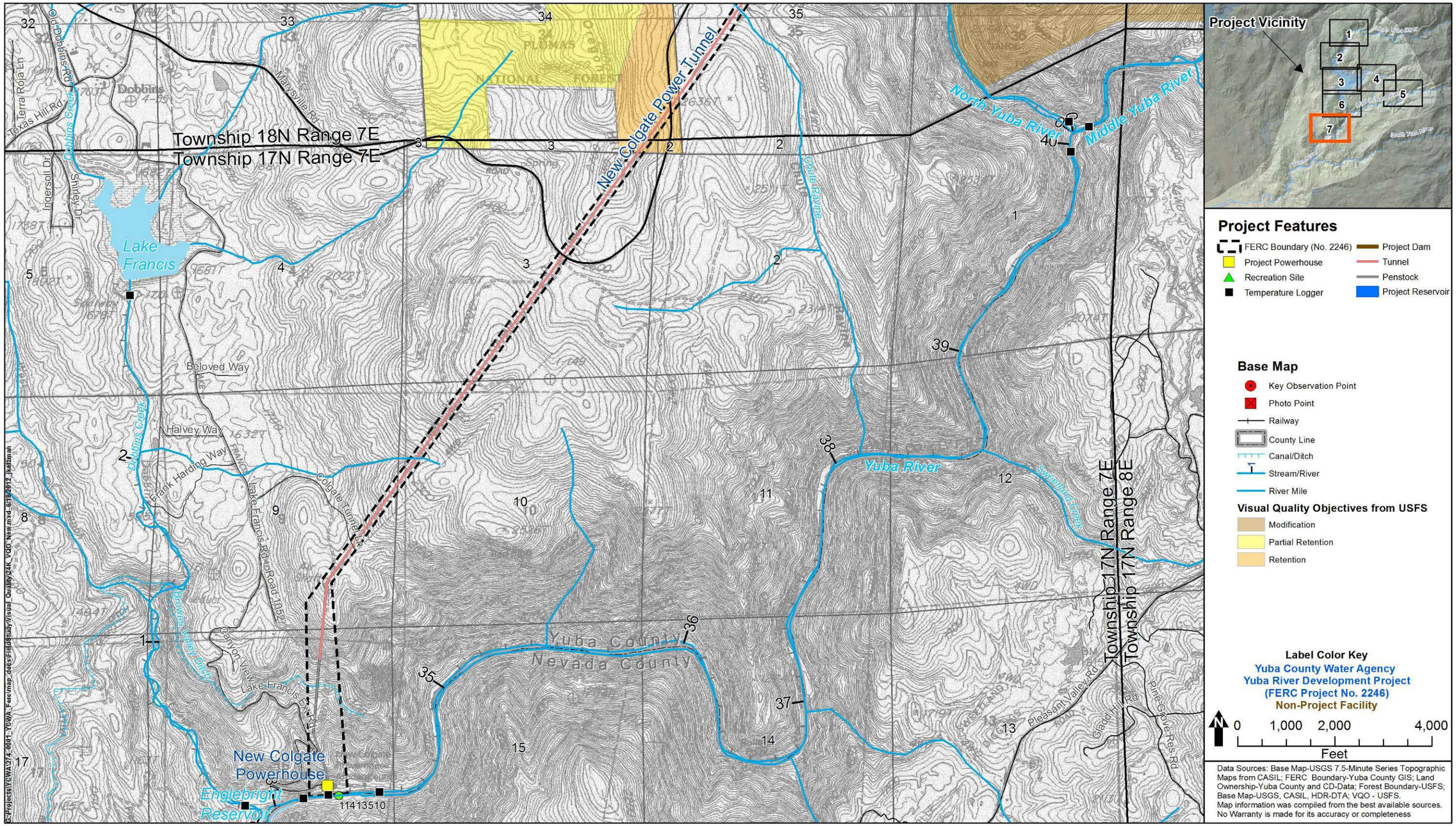

Figure 8. Downstream from New Bullards Bar Reservoir and Dam. No KOPs or PPs located on this map.

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Attachment 10-1B

Photographs of Project Reservoirs and Facilities

Yuba River Development Project

FERC Project No. 2246

July 2012

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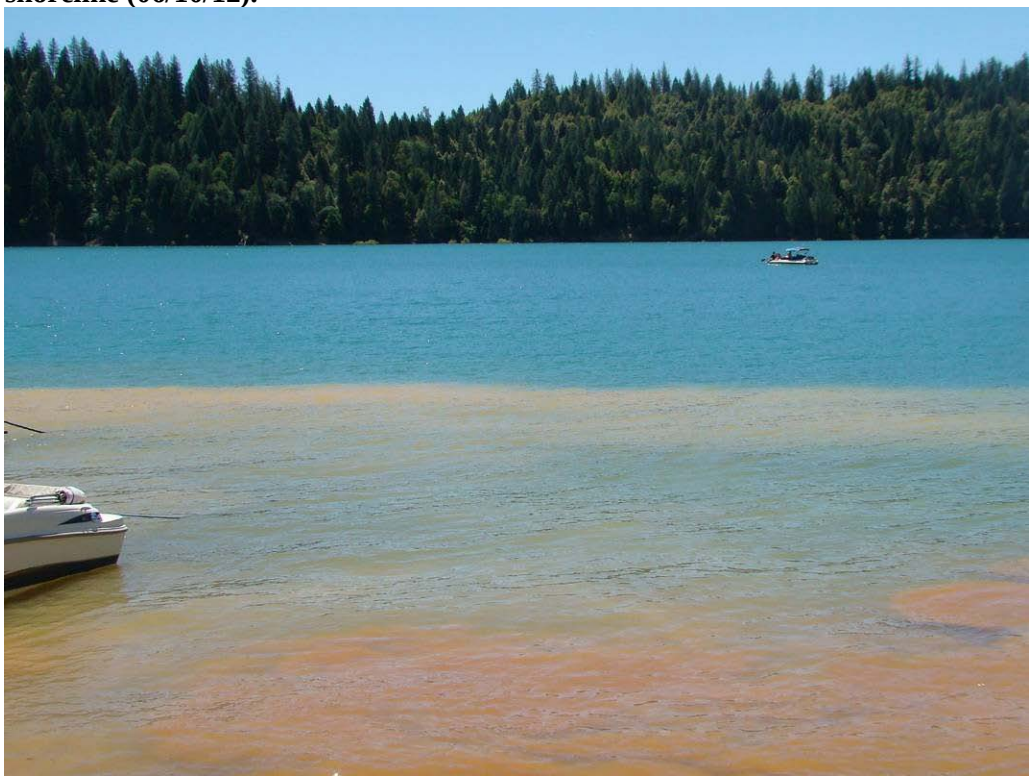

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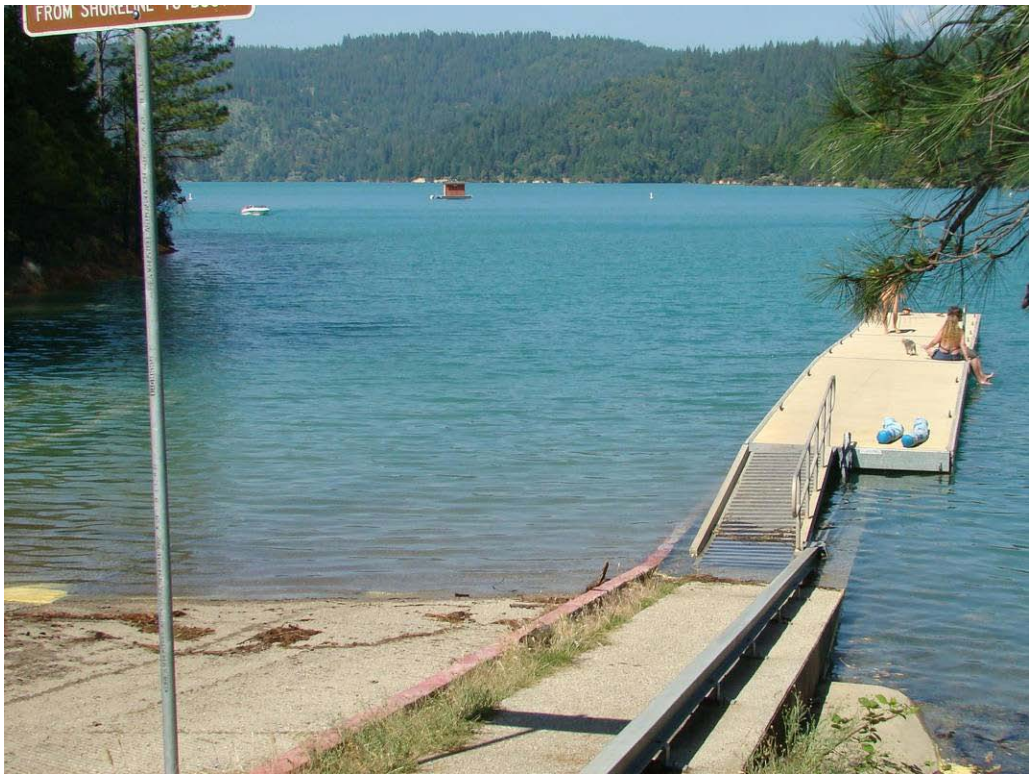

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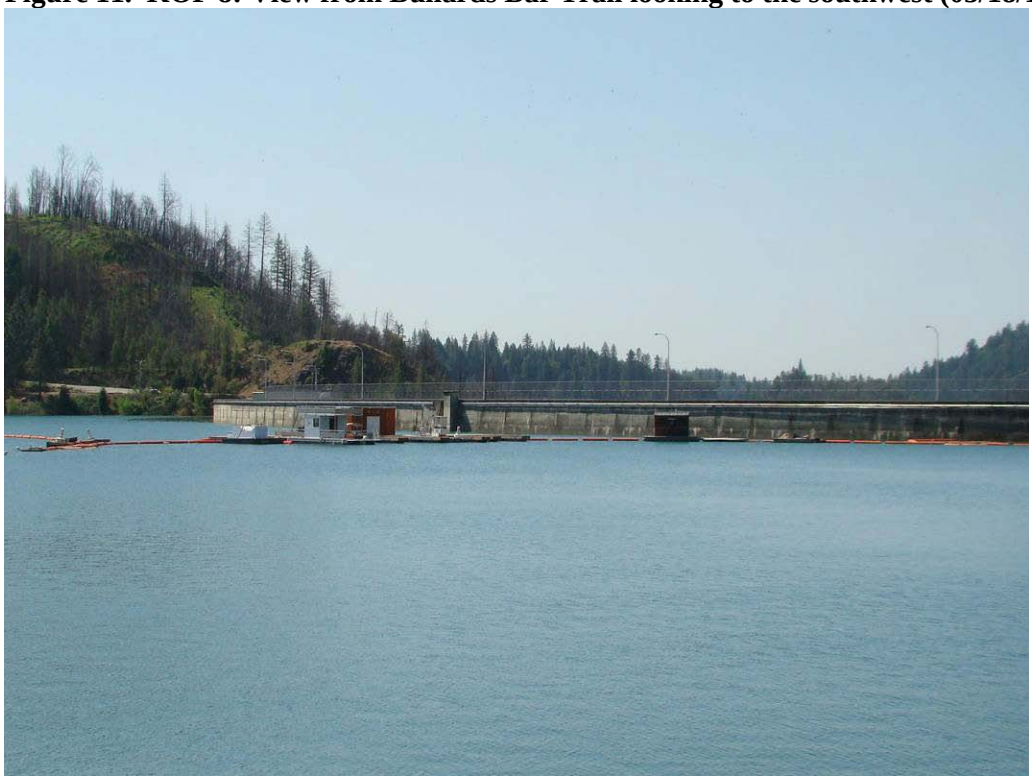

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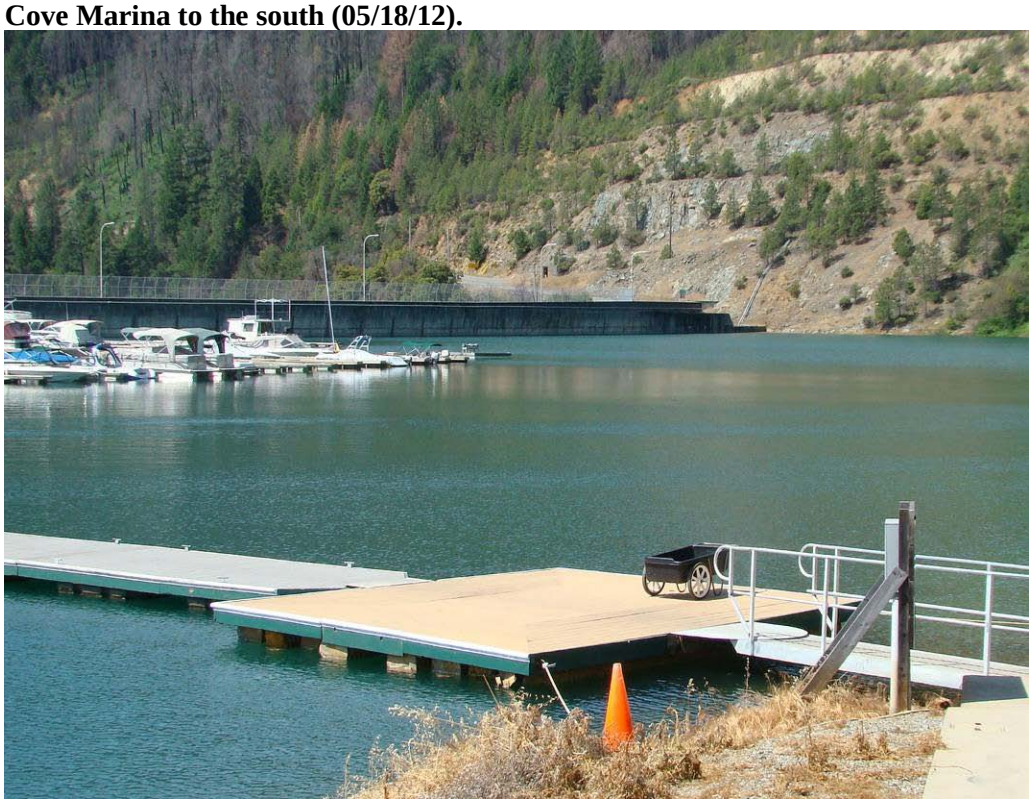

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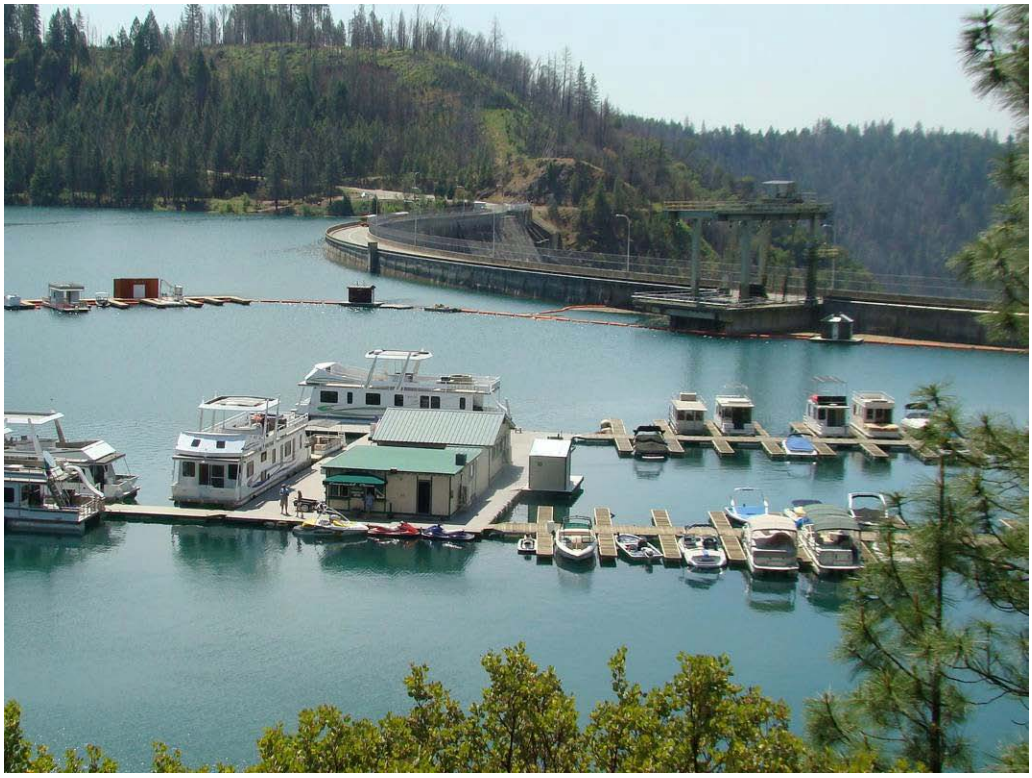
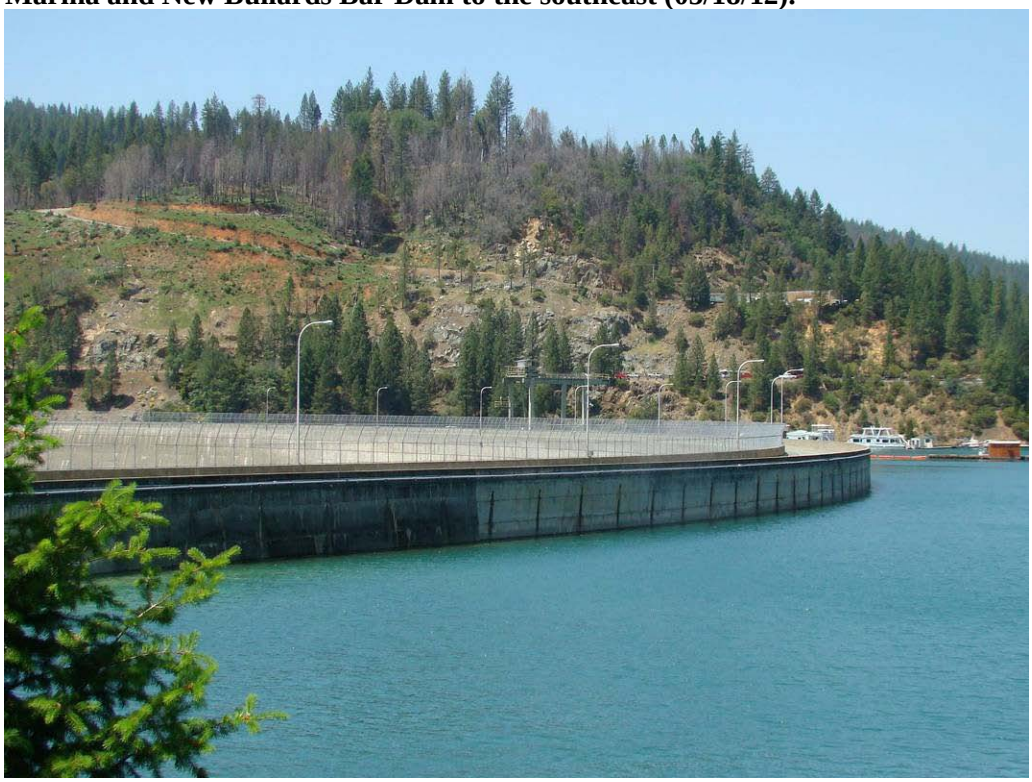


Figure 15. KOP 10: View from Cottage Creek Boat Launch parking area looking at Emerald Cove Marina and New Bullards Bar Dam to the southeast (05/18/12).



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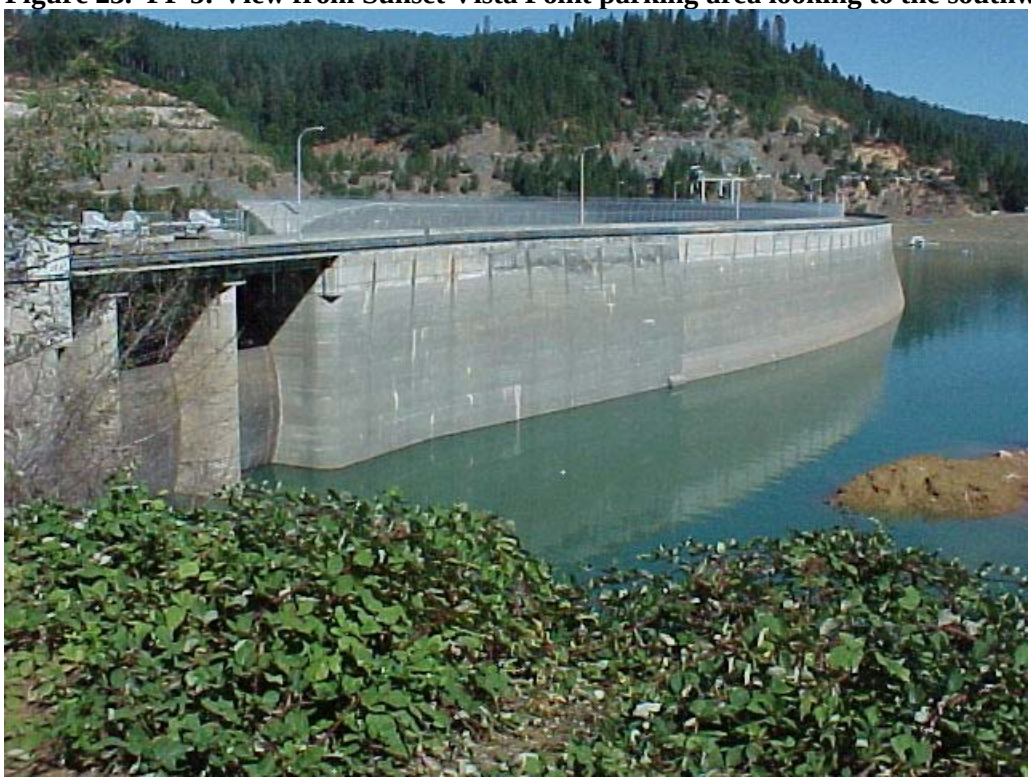

Figure 24. Archive photograph showing drawdown at the New Bullards Bar Dam.

Figure 25. Archive photograph showing typical drawdown along the shore of New Bullards Bar Reservoir.

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Attachment 10-1C

Summary of Forest Service Visual Management System

Yuba River Development Project

FERC Project No. 2246

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ATTACHMENT 10-1C

SUMMARY OF FOREST SERVICE VISUAL MANAGEMENT SYSTEM

1.0 Forest Service Visual Management System Summary

The following text is a summary of the United States Department of Agriculture (USDA) Forest Service (Forest Service) Visual Management System (VMS). This system is fully documented in the National Forest Landscape Management, Volume 2, Chapter 1, The Visual Management System (Forest Service 1974).

1.1 Sensitivity Levels

Sensitivity levels are a way to identify the different levels of concern people have for Forest Service scenic values. The basic assumption is that where there are high numbers of forest visitors using travel ways (roads and trails) or developed recreation facilities, including lakes and rivers, there is likely to be a high concern for scenic values. Conversely, where there are few people or the people are working in forest industries, there will be a lower concern for scenic values. This concept has been formalized by three categories, as follows: Sensitivity Level 1 includes primary travel routes and recreation use areas where visitors are expected to have a high concern for scenic values. Sensitivity Level 2 includes secondary travel routes and recreation use areas of lower use where visitors are expected to have a moderate concern for scenic values. Sensitivity Level 3 includes travel routes with low use, or that are for forest industry use, and areas with very low recreation use where concern would be expected to be low. Sensitivity Level 3 also includes areas with virtually no visitor use. Sensitivity levels should give the reader a relative sense of priority of scenic values from the user's perspective.

1.1.2 Seen Area Distance Zones

Three distance zones have been established to characterize what a visitor can see from a given view point. Areas seen closer in allow for observation of detail, and people have more clarity in terms of line, color, texture, and forms. Areas seen further away allow for less detail and the line, color, texture, and forms are less vivid. The general observation is that closer views are more critical. The three distance zones are:

- **Foreground (Fg):** The landscape seen within 0.5 mile of the observer. Sometimes foreground will extend to 0.75 mile to capture a close-in ridgeline that helps define the end of foreground.
- **Middle ground (Mg):** The landscape seen between 0.5 mile and an average of 3.0 miles. Key ridge lines can help define the end of middle ground.
- **Background (Bg):** The landscape seen beyond approximately 3.0 miles, usually up to 5 or 6 miles.

Seen area distance zones were mapped by sensitivity level for Forest Service inventories during the 1970s. Tahoe National Forest (TNF) and Plumas National Forest (PNF) landscape architects used a computer program (ViewIt) that mapped the seen area based on topographic maps and took into account topographic screening. Forest vegetation (primarily trees) was not considered in terms of visual screening. Distance zones are important as noted above because views tend to be more critical the closer an observer is to a facility or management activity**.**

1.2 Landscape Variety Class

Landscape Variety Class makes the premise that the more variety in landforms, rock forms, and water forms, the more attractive the landscape. The other premise is that all landscapes are valued, but landscapes of higher scenic quality should receive a higher priority for protection. During forest scenic inventories, three classes were mapped:

- Class A - Distinctive
- Class B - Common
- Class C - Minimal

Landscape Character Types were developed to describe regions with similar landscape character so that variety class ratings would be relative to that region. For example, a desert area would have different landscape characteristics than a mountainous area with high rainfall. Without Landscape Character Types, the tendency would be to rate the mountainous areas high and the foothills or desert relatively low. The Yuba River Development Project (Project) Area is located within the Sierra Nevada Mountains Character Type. Within the Character Type, characteristic landscapes are described that help the reader understand how facilities may contrast with these typical landscape elements of landform, waterform, and vegetation.

1.3 Resulting Inventory Visual Quality Objectives

The combination of distance zones, sensitivity levels, and variety class allows for a range of priorities for scenic quality. These combinations (for example, foreground Sensitivity Level 1, Variety Class A; or middle ground Sensitivity Level 2, Variety Class B) were all mapped as part of an inventory and then converted to Visual Quality Objectives (VQO). These priorities are expressed in the VQOs listed below.

- P = Preservation VQO (not in the matrix because it is a pre-existing requirement based on wilderness management)
- R = Retention VQO
- PR = Partial Retention VQO
- M = Modification VQO
- MM = Maximum Modification VQO (MM was mapped on the TNF inventory maps. MM was not chosen as a land management practice for the TNF and PNF Land

and Resource Management Plans (LRMP) and therefore are not displayed as part of the Recreation Element VQO Map)

Definitions of these inventory VQOs are as follows (Forest Service 1974):

Preservation (P): The Preservation VQO designation allows for ecological changes only. Management activities, except for very low visual impact recreation facilities, are prohibited. The objective applies to Wilderness Areas, primitive areas, other special classified areas, areas awaiting classification, and some unique management units that do not justify special classification.

Retention (R): The Retention VQO provides for management activities that are not visually evident. Under retention, activities may only repeat form, line, color, and texture that are frequently found in the characteristic landscape. Changes in their qualities of size, amount, intensity, direction, pattern, etc., should not be evident.

Partial Retention (PR): Under the Partial Retention VQO, management activities are to remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color, or texture common to the characteristic landscape, but changes in their qualities of size, amount, intensity, direction, pattern, etc., remain visually subordinate to the characteristic landscape. Activities may also introduce form, line, color, or texture that are found infrequently or not at all in the characteristic landscape, but they should remain visually subordinate to the visual strength of the characteristic landscape.

Modification (M): Under the Modification VQO, management activities may visually dominate the original characteristic landscape. However, activities of vegetative and landform alterations must borrow from naturally established form, line, color, or texture so completely and at such a scale that its visual characteristics are those of natural occurrences within the surrounding area or character type. Additional parts of these activities, such as structures, roads, slash, root wads, etc., should borrow naturally established form, line, color, and texture so completely and at such a scale that its visual characteristics are compatible with the natural surroundings.

Maximum Modification (MM): Management activities of vegetative and landform alterations may dominate the characteristic landscape. However, when viewed as background, the visual characteristics must be those of natural occurrences within the surrounding area or character type. When viewed as foreground or middle ground, they may not appear to completely borrow from naturally established form, line, color, or texture.

The combinations of landscape variety class, distance zone, and sensitivity level, along with the resulting VQOs, are shown in Table 1.3-1 below. The initial result of the mapping is an inventory map of VQOs. This inventory map is the recommended level for managing visual resources before any other resource issues are considered.

Table 1.3-1. Forest Service Inventory VQOs Resulting from Combinations of Distance Zone, Sensitivity Level, and Variety Class.

Landscape Variety Classes		Distance Zone and Sensitivity Level						
		Fg1	Mg1	Bg1	Fg2	Mg2	Bg2	3[1]
A	Distinctive	R	R	R	PR	PR	PR	PR
B	Common	R	PR	PR	PR	M	M	M/MM
C	Minimal	PR	PR	M	M	M	MM	MM

Source: Forest Service 1974.
[1] There are no distance zone designations associated with Sensitivity Level 3.

1.4 Tahoe National Forest and Plumas National Forest Land and Resource Management Plan Visual Quality Objectives

TNF's and PNF's LRMP VQOs represent Forest Service management direction throughout the life of the LRMP. LRMP VQOs are used in Forest Service decision-making to evaluate consistency of proposed actions with Forest Service visual resource management direction. VQOs are established to assure that visitors are afforded views of natural-looking landscapes when seen from Sensitivity Level 1 and 2 roads, trails, water bodies (streams, lakes, and reservoirs) and developed recreation use areas where public use is concentrated.

LRMP VQOs are established through the land management planning process where all Forest Service resources are inventoried and then weighed and balanced in combination with other resources. Depending on the emphasis, certain resources may receive a higher or lower priority. For visual quality, the inventoried VQOs are used as a starting point; in some areas, they may be raised a level, while in other areas, they may remain the same or drop a level. The result of this forest planning process is adopted VQOs, which for this report are called LRMP VQOs. For the TNF LRMP, Maximum Modification VQO was not mapped, but the LRMP assumed that 5 percent of capable, available, and suitable timber lands could be managed for Maximum Modification. The Sierra Nevada Framework document amended the LRMP and, for resource management reasons, eliminated the possibility of managing timber for Maximum Modification for both the TNF and PNF.

LRMP direction is typically organized in several ways. In California, LRMPs have goals, forest-wide standards and guidelines, and management area direction. For the TNF and PNF LRMP, the VQO definitions are part of the forest wide standards and guidelines, and a forest-wide map displays the array of LRMP VQOs. In addition, each management area has specific direction for VQOs. Sometimes, it is a specific application to a road or lake, and sometimes it is a general application of a VQO for the entire Management Area. .Management Area visual direction is described in Section 3.0 under the EVC summaries in the Visual Quality Technical Memorandum. LRMP VQOs are shown in Table 2.6-1 and Table 3.1-1 in the Technical Memorandum.

1.5 Existing Visual Condition

Existing Visual Condition (EVC) is an additional component of the VMS that was developed after the inventory system was introduced. EVC can be used as an analysis tool for evaluating

the visual effect of existing and/or proposed management activities. For this report, EVC is used to: 1) measure EVC, 2) compare EVC with LRMP visual objectives, and 3) provide basic data that would support future discussions about possible mitigation measures for facilities that may have visual impact issues.

The EVC system uses different definitions than VQOs, but the EVC definitions do match up with the VQO definitions. In other words, EVC Type I corresponds to Preservation; Type II corresponds to Retention; Type III corresponds to Partial Retention; Type IV corresponds to Modification; and Type V corresponds to Maximum Modification. EVC Types are defined by the Forest Service as follows:

- **Type I - Untouched.** No visual evidence of past management activities. Portions of wilderness are an example of this condition.
- **Type II - Changes Not Evident.** Little or no visual evidence of past management activities. Areas in which changes in the landscape are not visually evident to the average person unless pointed out. These areas are unnoticed.
- **Type III - Changes Evident, Natural Appearance Dominates.** Some evidence but management activities are subordinate. Areas where changes in the landscape are noticed by the average forest visitor, but they do not attract attention. The natural appearance of the landscape remains dominant. These areas appear to be minor disturbances.
- **Type IV - Moderate Contrasts, Changes are Obvious.** Moderate evidence and management activities are subordinate. Areas in which changes in the landscape are easily noticed by the average forest visitor and may attract some attention. These areas visually appear as disturbances but resemble natural patterns.
- **Type V - Strong Contrasts.** Moderate evidence and management activities generally dominate the landscape. Areas in which changes in the landscape are strong and would be obvious to the average forest visitor. These changes stand out as a dominating impression of the landscape, yet they are shaped so that they might resemble natural patterns when viewed from 3 to 5 mi or more distance. These areas visually appear to be major disturbances.

2.0 Scenery Management System

The VQOs as part of the Forest Plan were set in 1988 for the PNF and 1990 for the TNF based on the VMS created in 1974. In the 1990s, a new system called the Scenery Management System (SMS) was developed. This process culminated in a new SMS handbook dated December 1995 and a R5 SMS Implementation Process dated May 20, 2009. Both of these documents integrate visual resources with ecological processes and recognize the importance of cultural and historical values in the landscape. Both forests are directed to move to the new SMS approach but their LRMPs have not been amended to use the new system. Since the LRMPs for the PNF and TNF have adopted VQOs based on the VMS system, this technical memorandum will use the VMS vocabulary, VQOs, and EVC.

Most aspects of the VMS system carry over to the new SMS but there are additional concepts added so they are not a direct conversion. The VMS and SMS equivalents are shown in Table 2.0-1.

Table 2.0-1. VMS and SMS equivalents.

VMS	SMS
Characteristic Landscape	Scenic Character
Sensitivity levels	Concern Levels
Seen area maps	Landscape visibility
Variety Class	Scenic Attractiveness
Inventoried VQOs	Scenic Integrity Levels
Existing Visual Condition	Existing Scenic Integrity
LRMP VQOs	Scenic Integrity Objectives

In addition, a cross walk for VQOs to Scenic Integrity Objectives can also be helpful when transitioning to the new system. The crosswalk for objectives are shown in Table 2.0-2.

Table 2.0-2. Crosswalk for VQOs to Scenic Integrity Objectives.

VQOs	Scenic Integrity Objectives
Preservation	Very High (unaltered landscape)
Retention	High (appears unaltered landscape)
Partial Retention	Moderate (slightly altered landscape)
Modification	Low (moderately altered landscape)
Maximum Modification	Very Low (heavily altered landscape)

3.0 Landscape Character

For the Forest Service VMS, there was a recognition that to rate the visual quality of landscapes, a framework would be needed to compare similar landscapes by regions. The Forest Service formalized this with the term "Landscape Character" types. Landscape Character types were initially used by Forest Service landscape architects to develop criteria for rating variety class. When rating EVC, it is helpful to be aware of the local landscape character. As landscape character changes, colors, shapes, lines, or textures of facilities that may create visual contrast may change. For example, what may be considered a visual contrast in a natural forest setting may be visually acceptable in a desert setting. The landscape character for the Project Area described below is part of the information considered when making the EVC ratings that are found in Section 3.0, Results, in Technical Memorandum 10-1, Visual Quality on Federal Land.

Broadly speaking, the Project Area is located in the Sierra Nevada mountain range. This area can be described in more detail through subregions with specific visual characteristics. For the Sierra Nevada region, the area can be broken down into three subregions: 1) rugged mountain zone, 2) ridgetops and steep valleys, and 3) lower-elevation rolling terrain. These three subregions are described below:

3.1 Rugged Mountain Subregion

This area is characterized by rugged exposed bedrock, cliff faces, scree fields, many lakes, and steep dramatic valleys. Vegetation starts with red fir and lodge pole at the higher elevations, typically above 6,500 feet, transitioning to mixed conifer below 6,500 feet. Forest cover can be continuous but is often broken up by lakes and exposed bedrock. The Project Area is to the west of this subregion and a couple of thousand feet lower than this subregion. Bedrock in this subregion is mostly metamorphic with some sedimentary and volcanic mixed in, resulting in a wide range of colors, from red and brown to green, gray, and black. There are some granitic rock areas, as well, characterized by light, almost-white bedrock and boulders.

3.2 Ridgetops and Steep Valleys Subregion

This area is characterized by wide, flat ridgetops dropping off into steep, large river valley systems. Volcanic bedrock is typical at the higher elevations, volcanic soils in the mid elevations, and meta-sedimentary formations mixed with volcanic and metavolcanics in the lower elevations. New Bullards Bar Reservoir, Our House Diversion Dam, and Log Cabin Diversion Dam are in the western most reaches of this subregion. Most of this area is forested with mixed conifer stands along with oaks and madrone. In the lower elevation of this zone the vegetation seems to appear more dense and vigorous as if it is receiving more precipitation than areas further south on the TNF. Natural openings are not typical with the exception of some meadows and other areas of unstable slopes and slides. The areas of instability and, slides reveal exposed soils and bedrock with light browns, tans, orange to reddish clay soils, and yellow sandy soils. Unnatural openings have been introduced into this zone from hydraulic mining, logging, and wild fires. Lakes are not as common in this zone but reservoirs are located in the deeper valleys in this zone.

3.3 Lower-Elevation Rolling Terrain Subregion

This area is characterized by rolling hills, continuous mixed conifer forests with hardwoods, and steep river valley systems. Typical views are closed in by dense forest cover, and open views are primarily available at reservoirs. Forest vegetation seems to appear more dense and vigorous as if it is receiving more precipitation than areas further south on the TNF. Soils are reasonably deep and support stands of commercial forest. The lower half of New Bullards Bar Reservoir is in this subregion. Rock outcrops and cliff faces appear along the steep valley walls. A few miles to the west of New Bullards Bar Reservoir the area starts transitioning to the Foothill subregion which is beyond the Study Area.

3.4 Visual Character for the New Bullards Bar Area

The dominant visual character for the New Bullards Bar area is a continuous cover of mixed conifer forest along with oaks and madrone. Madrone, live oak, and black oak are a significant component of the mixed conifer forest in the New Bullards Bar Reservoir area. The forest vegetation is vigorous and dense with medium to fine texture and medium to dark green in color. In winter the conifers keep the hillsides looking predominantly green. In the spring the hillsides

look a bright more yellow green due to new growth on the conifers and new leaves on the deciduous trees. The terrain is rolling to flat ridges interspersed with deep valleys. Natural rock outcroppings and cliff faces are not common to see in the flatter terrain but do show up along the steep valley walls that cut through the flat ridge tops and rolling hills. Red clay soils along the shoreline are exposed when New Bullards Bar Reservoir starts drawing down its water supply. Visual contrast of Project facilities can be compared to the above visual character.