

Aquatic Habitat Survey and Fisheries Assessment

For

Clover Valley

Placer County, California

July 17, 2006

Prepared for:

Raney Planning and Management Inc.

CONTENTS

Aquatic Habitat Surveys and Fisheries Assessment

Clover Valley

INTRODUCTION..... 1
 Environmental Setting 1
 Occurrence Information 3
METHODS 4
 Habitat Assessment 4
 Fisheries Assessment 4
RESULTS 5
 Water Quality 5
 Habitat Assessment 5
 Fish Assessment 5
DISCUSSION..... 9
 General Fish Community13
 Steelhead and Fish Run Chinook Salmon13
 Upstream Passage for Adult Salmonids13
LITERATURE CITED11

LIST OF FIGURES

Figure 1 – Clover Valley Creek Habitat Assessment 2
Figure 2 – Total Species Composition and Relative Abundance for Lower Reach, Middle Reach,
 and Upper Reach, Clover Valley 2006.....12

LIST OF TABLES

Table 1 – Clover Valley Creek Habitat Mapping Summary by Reach, June, 2006..... 6
Table 2 – Habitat Mapping Summary, Clover Valley Creek, Lower Reach, June 16, 2006..... 7
Table 3 – Habitat Mapping Summary, Clover Valley Creek, Middle Reach, June 16h, 2006 8
Table 4 – Habitat Mapping Summary Clover Valley, Upper Reach, June 16th, 200610
Table 5 – Fish and Invertebrate Catch Data, clover Valley Creek, June 2006.....11

LIST OF APPENDICIES

Appendix A – Representative Site Photos

INTRODUCTION

Aquatic habitat surveys and fisheries assessment of upper Clover Valley Creek were conducted by ECORP Consulting, Inc (ECORP), per request of Raney Planning and Management, Inc. Clover Valley Creek, located in Placer County, is a tributary of Antelope Creek, which flows into Dry Creek just downstream of the Harding Road Bridge in Roseville. The current project area includes upper Clover Valley Creek in the northern end of Clover Valley, and is delineated by the hillside that forms the western limit of the valley, and the entire ridge to the east of the valley (Figure 1 – *Clover Valley Creek Habitat Assessment*).

Aquatic habitat and fisheries assessment information is presented for Clover Valley Creek to 1) assess the current fish community and quality of instream habitat for spawning and rearing of those fish species, and 2) assess the potential for presence of special-status fish species, especially steelhead (*Oncorhynchus mykiss*) and fall run Chinook salmon (*O. tshawytscha*), and the quality of spawning and rearing habitat for those species.

Environmental Setting

The Project area is characterized by a flat alluvial valley with relatively steeply sloped valley walls. Annual grassland comprises the dominant upland plant community in the valley; whereas, foothill oak woodland and shrub communities are present along the sloping valley walls. The annual grassland is dominated by non-native grasses including medusahead grass (*Taeniatherum caput-medusae*), ryegrass (*Lolium multiflorum*), wild oat (*Avena fatua*), soft chess (*Bromus hordeaceus*), and ripgut brome (*B. diandrus*). Herbaceous plants in the annual grassland community include filaree (*Erodium, sp.*) and star thistle (*Centaurea solstitialis*).

The riparian corridor along Clover Valley Creek supports valley oak (*Q. lobata*), willows (*Salix goodingii*, *S. hindsiana*, *S. laevigata*, and *S. lasiolepis*), white alder (*Alnus rhombifolia*), cottonwood (*Populus fremontii*), walnut (*Juglans nigra*), wild grape (*Vitis californica*) and Himalaya blackberry (*Rubus armeniacus*).

Figure 1

Occurrence Information

Prior to initiating fisheries surveys, a review of existing literature was performed. Historical data for Clover Valley Creek was found in a Placer County report (www.placer.ca.gov/planning/legacy/streams-lit-review/antelope-creek.pdf) which describes observations from spawning surveys conducted by California Department of Fish and Game (CDFG) on lower Clover Valley Creek (downstream from the current project area). That report states that Mr. Eric Gerstung (CDFG biologist) performed a salmonid spawning and redd (egg nest) survey in lower Clover Valley Creek on December 3, 1963. He concluded that about 10 pairs of fish spawned in fall 1963 in the lower ½ mile of Clover Valley Creek. An additional memo from Mr. Gerstung indicated that he conducted a survey of 1,000 ft of stream in fall, 1964, finding one carcass and one live fish. Also, a letter dated April 3, 1964 from the CDFG addressed construction activities in Sunset City, and concluded that fall-run Chinook salmon enter and spawn within the boundaries (of Sunset City) in both Antelope Creek and lower Clover Valley Creek.

No further spawning surveys were conducted in the vicinity of Clover Valley Creek until December 6, 1985 by Phil Hanson (CDFG Biologist). Reporting on a survey of Antelope Creek, Mr. Hanson stated 'the stream was surveyed from the confluence with Dry Creek to approximately one mile upstream. No live fish were seen, but one skeleton was observed.'

The Placer County report also describes the annual spawning surveys throughout the Dry Creek basin conducted by Dry Creek Conservancy (DCC). DCC has completed annual fall spawner/carcasses counts since 1997. These surveys are completed by volunteers, but, do not necessarily cover all known spawning areas in the Dry Creek watershed. The surveys include about 3,000 ft of Antelope Creek, but apparently do not include Clover Valley Creek.

A search of CDFG records resulted in no records of trout planting activities in Clover Valley Creek by the CDFG.

METHODS

ECORP conducted fisheries and stream habitat assessment on Clover Valley Creek on June 16 and 19, 2006.

Habitat Assessment

The habitat assessment followed methods outlined in the CDFG *California Salmonid Stream Habitat Restoration Manual* (Flossi *et al*, 1994). To facilitate evaluation of aquatic habitat in the 3-km (1.9 mi) long section of Clover Valley Creek within the current Project area, Clover Valley Creek was divided into three reaches: the lower reach, the middle reach, and the upper reach. The lower reach included about 4,553 ft. (0.86 mi.) of linear stream habitat, and extended between two major adjacent wetlands. The middle reach included about 2,804 ft (0.53 mi.) of stream, and extended from the upstream end of the lower reach to a point where the canyon narrows and stream gradient increases. The upper reach included 2,580 ft. (0.49 mi.) of stream and extended to the northern portion of the property. Due to the heavily vegetated riparian corridor and limited stream access, one representative 150 meter unit was established in each of the three reaches for quantitative habitat mapping (see Figure 1).

Each habitat unit was linearly measured with a tape measure. Habitat parameters collected for each habitat unit included length, width (i.e., wetted channel width), depth, dominant substrate types, aquatic cover, stream vegetation, canopy, and overhanging cover. All data were recorded on standardized field data sheets. Water quality data were collected with a YSI Model 556 multi-parameter unit.

Fisheries Assessment

A qualitative electrofishing survey was conducted in the same three reaches that were established for assessment of aquatic habitat. A four-person crew, utilizing two Smith-Root backpack electroshockers, conducted a one-pass survey in each reach, taking care to sample all habitat types within each reach. At the end of each reach, all species collected were identified, counted, measured for length, and assessed for overall health condition.

RESULTS

Water Quality

Water quality data were collected during the afternoon of June 19, 2006 (1250 pm) in the middle reach of the current Clover Valley Creek project area. Water temperature was 18.3 C, conductivity was 51 uS/cm, total dissolved solids were measured at 0.038 g/L, and pH was 7.0.

Habitat Assessment

Clover Valley Creek includes a variety of instream habitats from short riffles and long runs, to a variety of pool types. Habitat mapping was performed in the three, 150 meter reaches, which were established to characterize the stream segments (See Figure 1). A complete listing of Clover Valley Creek habitat units and associated characteristics are summarized by reach in Table 1. Representative site photos are presented for each reach in Appendix A.

The lower reach extends from the lower property boundary to a point approximately 4,553 feet (0.86 mi) upstream. Ten habitat units were defined in the 150 meter sampling sub-reach (Table 2). This low gradient reach (one percent) contains dense blackberry and other herbaceous vegetation on both banks, making the stream access difficult. The stream channel in this reach is generally characterized by low gradient glides with occasional shallow pool habitat. The stream channel ranges from 8.2 ft in

width in the riffle habitat, to 18.0 ft in width in a log enhanced lateral scour pool. The primary substrate is fine sediment/sand, with some gravel in the higher velocity habitat units.

The middle reach extends for approximately 2,804 feet (0.53 mi) from the top end of the lower reach. Fifteen habitat units were defined in the 150 meter sampling sub-reach (Table 3). Instream habitat in this low gradient reach (one to two percent) was glide/run dominated with occasional scour pools enhanced by root-wad or logs. The stream channel ranges from 8.2 feet in width in glide habitat to 14.8 feet in width in a low gradient riffle and a root-wad enhanced

Table 1

Table 2

Table 3

lateral scour pool. Riparian vegetation was generally abundant, and included alder, willow, blackberry, rice cutgrass, and other herbaceous vegetation.

The upper reach extends approximately 2,580 ft (0.49 mi) stream from the top of the middle reach to the upstream property boundary. Thirteen habitat units were defined in the 150 meter sampling sub-reach (Table 4). The stream channel in this reach is higher gradient (up to four percent) and narrower relative to the lower and middle reaches, and exhibits a moderate degree of down-cutting within the low-flow channel. The aquatic habitat is dominated by run and various pool types, generally formed by woody debris. An old cement weir is also present in this reach. The dominant substrate type in this reach was sand/silt, however gravel and cobble was sometimes locally abundant, especially in habitat units with higher water velocity.

Fish Assessment

A summary of the fish and aquatic invertebrate catch per reach is presented in Table 5. Four fish species and one aquatic invertebrate species were collected from Clover Valley Creek. The fish community in Clover Valley Creek is numerically dominated in all three study reaches by a native minnow, hitch (*Lavinia exilicauda*). The native Sacramento sucker (*Catostomus occidentalis*) is also present in all three reaches. The non-native western mosquitofish (*Gambusia affinis*) and green sunfish (*Lepomis cyanellus*) were also collected, but only from the lower reach. A non-native crayfish species (*Pacifasticus sp.*) was also collected in the lower and upper reaches (and were observed but not collected in the middle reach). No salmonids were observed during this survey.

Hitch were by far the dominant species collected in all three reaches (Figure 2), ranging from 80% to 93% of the entire catch by reach. They were most abundant in the upper reach. Sacramento sucker ranged from 6.7% of the catch in the upper reach to 11.6% in the middle reach. Like the hitch, the native sucker was most abundant in the upper reach, and adult suckers were collected only from the upper reach. Western mosquitofish (*Gambusia affinis*) and green sunfish (*Lepomis cyanellus*), both introduced species, accounted for 2.3 and 4.7

Table 4

Table 5

Figure 2

percent of the catch from the lower reach, and were not observed in the middle and upper reaches.

DISCUSSION

General Fish Community

The fish communities of the middle and upper reaches of Clover Valley Creek were composed entirely of two native fish species, other than the occasional presence of the non-native crayfish. Other fauna present were three introduced species, a centrarchid (green sunfish), Western mosquitofish, and crayfish, all of which were most abundant in the lower reach. No salmonids were observed during this survey.

Physical habitat characteristics observed during the habitat assessment and fisheries surveys are conducive to the present fisheries community. Hitch and Sacramento sucker both prefer slow-moving, low gradient streams with sandy to gravel substrates, as do green sunfish and Western mosquitofish. All four species are tolerant of warm water temperatures, which are characteristic of Clover Valley Creek, especially during summer and fall.

Steelhead and Fall Run Chinook Salmon

The National Marine Fisheries Service (NOAA) published the final critical habitat ruling in September 2005 (70FR542487) for both steelhead and fall run Chinook salmon. In their analysis, Clover Valley Creek is included in the Valley American Hydrologic Unit 5519 since it is a tributary of Antelope Creek (a tributary of Dry Creek). The streams designated as critical habitat in Unit 5519 are the "American River (38.6373, - 1121.2202); Dry Creek (38.7554, - 1121.2676); Miner's Ravine (38.8429, -1121.1178); Natomas East Main Canal (38.6646, - 1121.4770); and Secret Ravine (38.8541, - 1121.1223)." Neither Antelope Creek nor Clover Valley Creek are designated as critical habitat for either species.

Physical habitat characteristics observed during the habitat and fisheries surveys indicate unsuitable substrate and habitat conditions for rearing salmonids. The primary substrate components throughout Clover Valley Creek include fine sediments (sand and silt) with very little gravel/cobble substrate, especially in the lower and middle reaches. Hynes (1970) states 'that the larger the stones, and hence the more complex the substratum, the more diverse is the invertebrate fauna. Sand is a relatively poor habitat with few specimens of few species, apart from its microfauna, but silty sand is richer, and muddy substrata may be very rich in biomass although not in variety of species.' The benthic fauna in a stream with a sand substrate is not favorable for foraging salmonids. Juvenile salmonids tend to feed on Chironomid, mayfly, stonefly and caddisfly nymphs, as well as terrestrial insects, which can fall into the stream from riparian vegetation. Clover Valley Creek does have heavy riparian vegetation in the form of non-native blackberry, however, the lack of deep pool habitat and clean riffle habitat limits the potential for a more diverse invertebrate fauna, and therefore tends to limit food and preferred habitat for rearing salmonids.

Upstream Passage for Adult Salmonids

In a Personal Communication with Mr. James Navicky (CDFG Region 2 biologist), he stated that several barriers are present in Clover Valley Creek that currently prevent upstream migration of salmonids, particularly the Argonaut bridge perched culvert. He stated that rearing could potentially occur in the lower area of the stream, but there is no potential spawning habitat in the project area of Clover Valley. Based on our current habitat assessment, we concur that salmonid spawning habitat is not currently present in Clover Valley Creek, due to the lack of suitable substrates (i.e., gravels and cobbles) and habitats (i.e., riffles)

Furthermore, prior stream surveys conducted by ECORP for inclusion in the Draft EIR document the presence of several significant passage barriers in Clover Valley Creek downstream of the proposed project site which prevents upstream migration of anadromous salmonids into Clover Valley Creek. These barriers include Argonaut bridge crossing, an impoundment structure at Cimarron Court, an instream impoundment at downstream of Midas Way and another at the Rawhide Drive bridge. These barriers are considered significant to upstream migration of

salmonids and prevent upstream migration from occurring (ECORP Consulting, Inc., 2001). A detailed discussion of those passage barriers can be found in the Draft EIR.

LITERATURE CITED

ECORP Consulting, Inc., 2001. Letter from Tom Keegan to Sid Davis (Davis2 Consulting Earth Scientists). 2 pp.

ECORP Consulting, Inc., 2006. Clover Valley EIR.

Flossi, G. and F. L. Reynolds. 1994. California Salmonid Stream Habitat Restoration Manual. 2nd Edition. Inland Fisheries Division. California Department of Fish and Game, The Resource Agency.

Hynes, H.B.N. 1970. The Ecology of Running Waters. Blackburn Press, Caldwell, NJ. 555 pp.

(www.placer.ca.gov/planning/legacy/streams-lit-review/antelope-creek.pdf) Placer County website, Antelope Cree/Clover Valley Creek. 13 pp.

APPENDIX A

Representative Site Photos