

**East and West**  
**Walker River Watersheds**  
Mono County, California & Lyon County, Nevada

2008 Summary Report  
For the 2004 – 2008 Stream Habitat Surveys



Piute Meadows: West Walker River

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## Introduction

Within the Walker River drainage Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*) formerly occurred in Walker Lake and the tributary Walker River, upstream to the Pickle Meadows area on the West Walker River and upstream to the Bridgeport Valley area on the East Walker River. The Walker River Basin historically provided an estimated 595 miles of stream habitat (Kling and Mellison 2008) and 49,400 acres of lake habitat for the native Lahontan cutthroat trout (LCT). Populations of these salmonids within the watershed were interactive and interconnected, and therefore these metapopulations likely had high genetic diversity and were capable of long term persistence through adverse conditions.

At the present time self-sustaining lake populations of LCT no longer exist in the Walker River drainage and only a single endemic stream population exists in By-Day Creek, a very small tributary to the East Walker River. The completion of a series of dams on the Walker River and its two forks eliminated all natural reproduction of cutthroat trout in Walker Lake prior to 1940. The existing lake sport fishery is now artificially maintained. Due to lowering lake levels and associated dissolved oxygen depletion, high water temperatures, and increasing concentrations of dissolved salts, the lake fishery is declining and its future is uncertain. The introduction of non-native trout in the Walker River and its tributaries has resulted in the gradual extirpation of LCT from the drainage.

Although the only naturally occurring LCT population is in By-Day Creek, other small LCT populations have been established in the headwaters of Slinkard Creek, Mill Creek, Silver Creek, Wolf Creek, and Murphy Creek above impassible barriers. Mill Creek was chemically treated with rotenone in 1988 and 1989 to remove non-native fishes. In 1991 a 153 LCT, and in 2001 an additional 54 LCT, were captured from Slinkard Creek and released into the lower meadow section of Mill Creek, on CDFG land, within Reach 2 (Map 23). Silver Creek was chemically treated with rotenone in 1994, 1995, and 1996. In 1997, 78 LCT were released into Silver Creek. In 1998, an additional 102 LCT were released into Silver Creek. In 2004 while conducting a fish survey on Silver Creek, a large illegally introduced population of self-sustaining brook trout was found. These brook trout are severely impacting the LCT in Silver Creek. Wolf Creek was chemically treated with rotenone in 1991 and 1992 to remove non-native fishes. In 1993, 289 LCT were captured from Slinkard Creek and released into Wolf Creek in the meadow near Reach 2 Units 4 & 5 (Map 34). In 1998, an additional 53 LCT were released into Wolf Creek. In 1999, 56 LCT were moved into the upper meadow section near Reach 3 Unit 3. In 2003, 65 LCT were captured from Slinkard Creek and released into Wolf Creek near Reach 1 Unit 2 (Map 34). No known chemical treatment has occurred within the Murphy Creek watershed. In 1977, LCT were captured from By-Day Creek and released into Murphy Creek. All combined the By-Day Creek population and the isolated headwater pure populations of LCT in the East and West Fork Walker River watersheds occupy about 18 miles of stream habitat: approximately 3% of the total miles that LCT presumably occupied historically.

The West Walker River watershed originates in Mono County, California in the Hoover Wilderness. The river flows approximately 91 miles in a northeasterly direction until it connects with the East Walker River near Yerington, NV and then the Walker River flows to Walker Lake. Much of the upper West Walker River watershed is located on National Forest lands and is managed by the Humboldt-Toiyabe National Forest (HTNF), Bridgeport Ranger District. Much of the upper West Walker River watershed also occurs within the Hoover Wilderness. In addition to the West Walker River, 24 other tributary streams were also surveyed in the West Walker River watershed.

The East Walker River also begins in Mono County, California just upstream of Bridgeport Reservoir and flows in a northeasterly direction into Nevada's Lyon County. It flows for approximately 72 miles until it connects with the West Walker River downstream of Topaz Lake. Much of the upper East Walker River watershed is also located on National Forest lands and is managed by the HTNF, Bridgeport Ranger District. Much of the upper East Walker River watershed also occurs within the Hoover Wilderness. In addition to the East Walker River, 17 other tributary streams were also surveyed in the East Walker River watershed.

### **Purpose and Need**

The 1995 Lahontan Cutthroat Trout Recovery Plan recommended that an ecosystem management plan be developed for the Walker River Basin in order to both determine objectives for the future desired conditions of the watershed, and to create strategies for achieving these objectives. In 1998 a Walker River Basin Recovery Implementation Team was organized to develop strategies for Lahontan cutthroat trout restoration and recovery efforts in the Walker River Basin. In August 2003 the recovery team completed a Short-Term Action Plan for Lahontan Cutthroat Trout Recovery in the Walker River Basin. The short-term action plan outlines specific tasks to be completed within five years. Some of the tasks that were identified include: (1) identifying and evaluating fish passage and existing barriers within the Walker River Basin, (2) developing a watershed analysis of the physical components of the Walker River Basin, and (3) initiating habitat surveys to evaluate potential LCT introduction streams and validating against existing LCT inhabited streams.

The primary causes for the decline of LCT include: (1) reduction and alteration of stream discharge, (2) alteration of stream channels and morphology, (3) degradation of water quality, (4) reduction of lake levels and concentrated chemical components in natural lakes, and (5) introductions of non-native fish species. The Walker River Basin is primarily inhabited by non-native salmonid species that include but are not limited to: rainbow trout (*Oncorhynchus mykiss*), brook trout (*Salvelinus fontinalis*), and brown trout (*Salmo trutta*). These competitive and aggressive introduced fish have displaced the endemic LCT in streams where they coexist.

Long term survival and recovery of LCT within the Walker River Basin will require sustained cooperation and effort from multiple federal and state agencies, including

all members of the Walker River Recovery Implementation Team. Gaining information through immediate action can aid in prioritizing future objectives for the restoration and recovery of LCT. The 2004-2008 Walker River watershed surveys were conducted to gain information about streams in the basin, and furthermore to provide an inventory of potential fish habitat for LCT. The surveys included the tasks of identifying potential fish passage barriers and evaluating physical characteristics that pertain to the success of the native LCT. Should recommendations be made to reintroduce LCT, these surveys can provide baseline information for future management of the fishery. All the streams listed in Table 1 were surveyed during the summers 2004-2008 by members of the Carson and Bridgeport Ranger Districts, Humboldt-Toiyabe National Forest. In addition, the members of the Carson and Bridgeport Fisheries Department have also compiled individual reports for most of the streams listed in Table 1. The surveyors included Jason Kling, Brian Hodge, Robert Omann, Joel Ingram, Harrison Davis, Kevin Rybacki, Francisco Rayos, and Merri Melde. Each of the individual reports was reviewed by Jason Kling, Zone Fish Biologist on the Carson and Bridgeport Ranger Districts. The U.S. Fish and Wildlife Service (USFWS) assisted with the Deep and Cottonwood Creek stream habitat surveys and they provided the funding to complete the stream habitat surveys on the mainstem East and West Walker River's. Surveyors from the USFWS included Stephanie Byers, Kevin Meyer, and Jon Thompson.

## **Methods and Materials**

Personnel surveyed the East and West Walker River watersheds by hiking each watercourse in an upstream manner. Interesting and relevant features were documented, photographed, and recorded into a GPS unit. These features included but were not limited to: adjacent road impacts, road crossings, fish sightings, permanent fish barriers, seasonal fish barriers, tributaries, springs, beaver dams, campsites, areas of erosion concern, grazing impacts, etc. Appendix I includes maps for each stream surveyed. Each map shows the location of each feature collected. Each feature was assigned a site number and each feature has a corresponding photograph that has also been assigned the same site number. Most of the streams in Table 1 have their own individual stream habitat survey report. Each of those individual reports contains the pictures for each feature collected.

Fish passage barriers were noted and categorized into one of four categories: natural-permanent, natural-seasonal, artificial-permanent, and artificial-seasonal. A permanent barrier is categorized as an obstacle, waterfall, or drop in excess of 5 feet that would prevent passage of fish year-round (specifically LCT). A stadia rod was used to measure barriers where applicable. Some permanent barriers may actually act as seasonal barriers and some seasonal barriers may actually act as a permanent barrier.

## Results and Discussion

A total of 43 streams were surveyed from 2005 to 2008 within the East and West Walker River watersheds. Approximately 287 miles of stream habitat was surveyed; approximately 129 miles within the East Walker River drainage and approximately 158 miles within the West Walker River drainage. Information and pictures were taken for nearly 800 features. Approximately 213 miles of potential LCT habitat was identified and approximately 18 miles of occupied LCT habitat was identified.

Fish passage barriers were documented at 145 different locations. Natural permanent barriers were found at 90 locations, natural seasonal barriers were found at 41 locations, artificial permanent barriers were found at 8 locations, and artificial seasonal barriers were found at 6 locations. A culvert on By-Day Creek (Map 10) and a culvert on Sardine Creek at Site 19 (Map 36) are forming artificial permanent fish barriers. Three culverts are inhibiting fish passage seasonally; a culvert on Fryingpan Creek at Site 2 (Map 6), a culvert at Site 3 on Molybdenite Creek (Map 31), and a culvert at Site 7 on Poison Creek (Map 30). Fish passage should be restored at the Fryingpan Creek, Molybdenite Creek, and Poison Creek culvert locations. The By-Day Creek culvert should not be altered because that culvert is inhibiting non-native fish passage into the By-Day Creek watershed. The Sardine Creek culvert should also be left unaltered because that culvert occurs within an area that was identified as not having potential LCT habitat and a naturally occurring permanent fish barrier occurs just downstream of the culvert. Artificial permanent barriers are also created by dams as they regulate water levels as streams flow from larger bodies of water. These barriers are located on the East Walker River as it flows out of Bridgeport Reservoir (Site 58; Map 3), on Green Creek as it flows from Green Lake (Site 11; Map 15) and East Lake (Site 13; Map 15), and on Poore Creek as it flows out of Poore Lake (Site 12; Map 33). Another artificial permanent barrier can be found on Desert Creek (Site 1; Map 22) as a waterfall has been constructed in an effort to help divert some of the stream for irrigation. The cement footings of a bridge crossing on Bodie Creek (Site 8; Map 5) form a seasonal artificial fish passage barrier and a rock gabion constructed on By-Day Creek (Map 10) is forming a seasonal barrier. By-Day Creek has a second gabion structure on the North Fork that is forming a permanent barrier. A wooden diversion on Mill Creek (Map 23) on lands managed by the California Department of Fish and Game is also forming a seasonal fish passage barrier. Fish passage should be restored at the seasonal barrier locations found on Bodie and Mill creeks. The barrier on Desert Creek and the gabion seasonal barrier on By-Day Creek should be further investigated to determine if restoring fish passage at those sites is warranted. The gabion permanent barrier on the North Fork of By-Day Creek should be left unaltered because no potential LCT habitat exist upstream of the permanent barrier.

Adjacent road impacts were noted primarily in areas where a road is close to the stream and due to the close proximity, erosion impacts are occurring. Three adjacent road impacts were documented on Bodie Creek, East Walker River and Rough Creek.

Eighteen beaver dams were documented throughout the East and West Walker River watersheds. The Little Walker River contains the most beaver activity with three dams located on the river along with two located on Molybdenite Creek and one on Poison Creek, both of which are tributaries to the Little Walker River. There were also two beaver dams on both Deep and Rough creeks as well as a single dam found on Buckeye, Dunderberg, Poore, Robinson and Wolf creeks and one on the West Walker River.

There were 129 campsites documented throughout the survey area. Whenever a campsite was seen from the watercourse, information such as total number of campsites within the immediate area, campsite dimensions, and distance between the campsite and the watercourse was collected. Of all the streams surveyed, the East and West Walker Rivers and Virginia Creek are impacted the most from campsites. The East Walker River has 35 campsites along 32.5 miles of the river surveyed. All the campsites are road accessible and located in good fishing areas. The West Walker River has 46 campsites spread out over the 36 miles of river surveyed. Chris Flat Campground and Leavitt Meadows Campground provide 31 of the 46 campsites. Virginia Creek has 16 campsites located along the 2.6 mile stretch of stream surveyed. Of the 16 campsites all but one are Forest Service regulated with established fire rings, road accessibility and parking, and nearby vaulted toilets. The large number of campsites within this short section of stream is evidence that Virginia Creek receives heavy human traffic that is having a negative impact on the stream. The other campsites are spread throughout the rest of the survey area. Approximately 75% of all the campsites documented are found on the East and West Walker Rivers, and on Virginia Creek.

Fifteen water diversion structures were identified throughout the survey area. Buckeye Creek and the East Walker River each have two diversion structures. The East Walker River has additional diversions on private land that could only be seen from a distance. Because these diversions were not surveyed, they are not included as part of the 15. Cowcamp Creek, Fryingpan Creek, Leavitt Creek, Little Walker River, Rough Creek, and the West Walker River each have one diversion. All of these diversions should be further investigated to ensure that fish are not subject to terminal trips into irrigated pasture, etc. and to also ensure that water users are staying within the confines of their adjudicated rights. Dunderberg Creek appears to be impacted the most from water diversions. There are five diversions located on Dunderberg Creek. At one point the entire stream is diverted into an artificially created channel. The stream flows for approximately 1 mile before it reenters its natural channel. The Dunderberg Creek diversions should be highest on the priority list when it comes to investigating diversions and adjudicated water rights.

Erosion concerns were noted in areas where the stream bank is unstable and often times sloughing off into the water. When an erosion concern was seen, the estimated height and length of the erosion was collected. Out of the 43 streams surveyed, erosion concerns were documented on 14 streams; Buckeye Creek, Cottonwood Creek, East Walker River, Leavitt Creek, Little Walker River, Mill Creek, Murphy

Creek, Poison Creek, Rough Creek, Sardine Creek, Virginia Creek, West Fork West Walker, West Walker River, and Wolf Creek. The East and West Walker Rivers had the most erosion concerns documented. The erosion concerns on the West Walker River are primarily located just downstream of Chris Flat Campground and are due to the flooding that occurred in 1997. The erosion concerns on the East Walker River are primarily found on both sides the river near “The Elbow.”

Fish sightings were obviously documented throughout the survey area. Whenever fish were seen crews collected a GPS location and recorded how many fish were seen. Throughout the survey area fish were documented at 27 different locations.

Throughout the survey area there were eighteen sites that were documented as “other.” These sites varied among forks in the stream (Cattle Creek, Leavitt Creek), burn areas (East Walker River), the formation of ponds or seepage (East Walker River, Cottonwood Creek) and downed trees (Buckeye Creek). There are also eight sites that have some sort of fence crossing the stream to regulate cattle or mark property boundaries. These sites are found on Cowcamp Creek, Dunderberg Creek, Murphy Creek, and on the East and West Walker Rivers. Shinglewood day use area on the West Walker River is also listed as “other.”

Approximately 77 total photo points were collected throughout the survey area. Photo points mostly consisted of general photos that captured the typical stream characteristics and vegetation for that section of stream.

Approximately 79 road stream crossings were documented throughout the survey area. Of the 79 crossings, 38 were ford crossings, 27 were bridges, and 14 were culverts. Bodie Creek and Desert Creek are being impacted the most by road stream crossings. Desert Creek has 11 road stream crossings and Bodie Creek has 8 crossings. In addition, the East Walker River and Fryingpan Creek each have 6 road stream crossings. A few of the culverts are acting as aquatic organism passage barriers. These culverts are discussed in the fish barrier section of this report.

Twenty-one trail crossings were documented. Whenever a trail crossed a stream, the GPS location and a picture of the area were taken. Most of the trail crossings were ford crossings; however there was one bridge crossing on the West Walker River (Site 29; Map 19), and one bridge crossing on the West Fork West Walker River (Site 25; Map 39). The two streams with the most trail crossings were the West Walker River with 7 trail crossings and the West Fork West Walker River with 4 trail crossings. These trail crossings along with 2 crossings on Long Canyon Creek all occur in the Hoover Wilderness.

Approximately 143 tributaries were documented in the East and West Walker River watersheds. At each tributary the location of the tributary (river right or river left) and the estimated percent contribution of the total overall flow were collected. A picture of each tributary was also taken.

There were five sites, all of which were located on the East Walker River, that were documented as weed concern. These sites were documented whenever an invasive weed was seen on the stream bank. Three different noxious weeds were seen on the East Walker River; tamarisk, hoary cress and tall whitetop.

As seasonal crews were conducting these stream habitat surveys, they were also identifying areas that provide potential LCT habitat so that potential LCT introduction streams could be identified and ranked as high, medium, or low candidates for restoration. As crews were searching for areas that provide potential LCT habitat, qualities that they were visually looking for included: 1) clear cold water streams, 2) pools in close proximity to cover and velocity breaks to provide hiding and spawning areas, 3) well vegetated and stable stream banks, 4) adequate cover: 50% or more of the stream area, 5) rocky substrate and riffle-run areas, absent of fine silt, 6) continuous stream, absent of barriers, 7) potential for restoring a metapopulation, 8) complexity of habitat: pool/run/riffle, 9) low-moderate gradient: < 15%, 10) current occupation by salmonids, and 11) amount of public use in the area. Based on all these attributes, potential LCT habitat was identified, quantified, and streams were divided into three categories; high, medium, or low candidates for restoration. Table 2 summarizes the amount of potential LCT habitat that was identified for each stream surveyed, and it summarizes which streams are classified as high, medium, or low candidates for restoration.

**Lower East Walker Watershed** (East Walker River, Rough Creek, Bodie Creek, Aurora Creek, Fryingpan Creek, and Murphy Creek)

The East Walker River provides 32.5 miles of potential LCT habitat between Bridgeport Reservoir and Flying M Ranch (Maps 1-3). Downstream of Flying M Ranch, there is a high probability that more potential LCT habitat exists. That area was not surveyed because much of that land is privately owned. While surveying the East Walker River the only barrier identified was an artificial permanent barrier at the spillway on Bridgeport Reservoir. The East Walker has 17 tributaries that were surveyed, 12 of which offer additional LCT habitat. The widespread presence of non-native salmonids in the East Walker River and its many tributaries prevents any immediate reintroduction of LCT into the mainstem, unless LCT are stocked as a put-and-take recreational fishery. The ability of LCT to successfully persist with the presence of non-native salmonids within a large river system is unknown at this time. In small tributary streams we do know that LCT are unable to persist successfully in the presence of non-native salmonids.

Opportunities do exist for restoring LCT and metapopulations in the East and West Walker watersheds. In the lower East Walker River, the Rough and Bodie Creek drainages provide an opportunity for restoring a metapopulation of LCT. Rough Creek offers at minimum 10.5 miles of potential LCT habitat (Map 4). Rough Creek probably provides an additional 4 miles of habitat through the Nine Mile Ranch area and 11.4 miles of stream habitat in California on lands managed by the Bureau of Land Management (BLM). The topography of the area as well as views from Forest

Service Road 028 suggests that the stream does offer LCT habitat through Nine Mile Ranch. The only barrier found on Rough Creek is a seasonal barrier located at Site 17. Bodie Creek, a tributary to Rough Creek, provides another 10.1 miles of potential LCT habitat (Map 5). One permanent fish barrier was found on Bodie Creek at Site 18 near the California-Nevada boundary and an artificial seasonal barrier occurs at Site 8. Bodie Creek probably would provide an additional 7.3 miles of habitat in California on lands managed by the BLM; but it occurs upstream of the permanent barrier and therefore would be disconnected from the rest of the Bodie and Rough Creek watersheds. Together Rough and Bodie Creeks provide at minimum 20.6 miles of potential LCT habitat, and may provide a minimum of 43 miles of potential LCT metapopulation habitat. Aurora Creek, which is a tributary to Bodie Creek, was dry and therefore was not surveyed.

Fryingpan Creek offers 3.6 miles of potential LCT habitat between Sites 1 and 12 (Map 6). This section of the stream is low gradient and has good complexity of pools and riffles. At Site 2 a 4.3 foot artificial seasonal fish barrier prevents upstream movement of fish from the East Walker River into Fryingpan Creek. This 4.3 foot feature may also very likely be a permanent fish barrier. The barrier at Site 2 may allow for a short-term restoration project of LCT upstream of Site 2. Although those LCT would be physically and genetically isolated, they would also be protected from the non-native fish downstream in the East Walker River. If LCT were restored to Fryingpan Creek upstream of Site 2 at anytime in the future those LCT could be reconnected with the rest of the East Walker River watershed by altering the artificial structure at Site 2 to allow fish passage. Due to the relatively short distance of potential habitat and inability to restore a metapopulation, Fryingpan Creek is listed as a low candidate for restoration.

The distribution of LCT within the Murphy Creek watershed is limited to approximately 2.8 miles of Murphy Creek (Map 7). Lahontan cutthroat trout are unlikely to extend their distribution upstream of their current distribution within the East and West Forks of Murphy Creek due to increased gradient. Habitat conditions in Murphy Creek within Reach 1 are fairly good. Typical habitat consists of riffles, pools, a lot of overhanging cover, and well vegetated stream banks. Additional information regarding actual population densities and population trends for Murphy Creek is found in its individual stream habitat survey report. Downstream of the occupied LCT habitat, Murphy Creek offers 1.1 miles of potential LCT habitat between Sites 1 and 9, and 1.7 miles of potential habitat between Sites 14 and 16. Four permanent fish passage barriers were found on Murphy Creek; therefore, the entire Murphy Creek watershed is not connected. Non-native fish in the East Walker River can only migrate up into the Murphy Creek watershed 1.1 miles to the first permanent fish barrier at Site 9. Murphy Creek should be surveyed for non-native fish between Sites 14 and 16, and if no non-native fish are found within this section of stream, stocking LCT into this section between Sites 14 and 16 to expand the distribution of LCT in Murphy Creek should be considered.

**Upper East Walker Watershed** (East Walker River, Sario Canyon Creek, Long Valley Creek, Huntoon Creek, Patterson Creek, By-Day Creek, Buckeye Creek, Eagle Creek, Robinson Creek, Cattle Creek, Green Creek, Virginia Creek, Dunderberg Creek)

Long Valley Creek offers 1.9 miles of potential LCT habitat located between Sites 1 and 5 (Map 8). Upstream of Site 5, Long Valley Creek does not have enough water to support a sustained population of fish. Site 5 is the confluence of Huntoon Creek and Long Valley Creek. Huntoon Creek contributes approximately 60-70% of the overall flow in Long Valley Creek. Huntoon Creek provides an additional 3.1 miles of potential LCT habitat (Map 9). The two creeks combined provide approximately 5 miles of potential LCT habitat. Site 2 on Long Valley Creek is an 8.2 foot high naturally occurring permanent fish passage barrier. No other barriers were identified on Long Valley Creek. Only one fish barrier was identified on Huntoon Creek; a 3 foot high seasonal barrier. Because flows upstream of Site 5 on Long Valley Creek are so minimal and can't support a sustained population of fish, if a population of LCT were to be restored to Long Valley and Huntoon Creeks, that restored population of LCT would not be a metapopulation using two different drainages. For this reason Huntoon and Long Valley Creeks are listed as medium candidates for restoration.

By-Day Creek supports 1.1 miles of occupied LCT habitat (Map 10). An additional 2 miles of potential LCT habitat occurs within the watershed. Lahontan cutthroat trout are likely limited to the 1.1 miles due to low water levels. Additional information regarding actual population densities and population trends for By-Day Creek is found in its individual stream habitat survey report.

Buckeye Creek provides 10.5 miles of potential LCT habitat between Sites 1 and 29 (Map 11). The most favorable LCT habitat occurs between Sites 1 and 22, and between Sites 25 and 27. Between Sites 1 and 22, Buckeye Creek offers a large free flowing stream with good riffle and pool complexity. The section between Sites 14 and 16 offers good slow water habitat with several undercut banks. The section of stream between Sites 25 and 27 is favorable LCT habitat because through this section the stream is moving slowly and there is a lot of underwater structure to provide shelter. Through this section the stream meanders through groves of large trees and thick underbrush. This section offers deep pools and undercut banks, and good fish habitat created by fallen trees and large rocks. Although Eagle Creek is a tributary of Buckeye Creek, there is no potential for restoring a metapopulation of LCT because the Eagle Creek watershed does not provide potential LCT habitat (Map 12). The overall gradient of Eagle Creek between Site 1 and the top of the watershed is 9.4%. Although no permanent or seasonal fish barriers were identified within the Eagle Creek watershed, the Forest Service personnel who conducted this survey characterized the watershed as being high gradient, with lots of steep-long riffles, and very few pools. Based on these habitat characteristics and not seeing any fish, the Forest Service personnel determined that the Eagle Creek watershed does not provide potential LCT habitat. Because no potential exist for restoring a metapopulation of

LCT within the Buckeye and Eagle Creek drainages, Buckeye Creek is listed as a medium candidate for restoration.

Robinson Creek provides approximately 2.6 miles of potential LCT habitat between Site 1 and Site 8 (Map 13). Through this lowest reach the shallow and wide stream meanders through large meadows. A 15m (49ft) high waterfall at Site 8 prevents year-round upstream fish passage. The section of stream between Sites 8 and 24 is characterized as high gradient with the presence of multiple permanent fish passage barriers. Non-native fish were sighted throughout the watershed; however, many of these fish were probably aurally stocked in several of the lakes within the watershed and subsequently those fish have been able to migrate downstream but not back upstream. Due to the limited miles of potential LCT habitat that Robinson Creek offers and the presence of barriers, Robinson Creek is listed at a low candidate for restoration.

Cattle Creek provides 2.4 miles of potential LCT habitat between Sites 7 and 15 (Map 14). From the point where the creek enters Lower Twin Lakes until the open meadow after Site 6 fish habitat is not present. This 1.1 mile stretch has several barriers as the gradient is very steep (25.7%) and the elevation gain is well over 1000 feet. This section is characterized by its many barriers including cascading waterfalls and rock gabions as high velocity water flows over large boulders. This section also provides limited pools for habitat and has many braids in the stream. Between Sites 7 and 15, the stream flows mostly through meadows and contains only two seasonal barriers located at Sites 12 and 13. This section of the stream is characterized by long runs, low gradient riffles, and plenty of pools. One limiting factor through this section of the creek is the presence of non-native fish species. If LCT were restored to this section of stream, they would be physically and genetically isolated. Due to the short distance of potential LCT habitat that is offered, and the steep gradient and presence of several barriers between Sites 1 and 6, Cattle Creek is listed as a low candidate for restoration.

Green Creek provides 2.4 miles of potential LCT habitat between Site 1 and Site 7 (Map 15). Between Sites 1 and 6 the stream provides slow deep water with lots of underwater structure like fallen trees, old beaver dams in disrepair, and cut banks. Even though a permanent fish barrier exist at Site 3, the areas above and below this fish barrier provide potential LCT habitat. Upstream of Site 7 the stream has a higher gradient and three different permanent natural fish barriers were identified. These barriers would leave fish genetically and physically isolated. Two artificial barriers were also documented upstream of Site 7. Non-native fish were sighted throughout the watershed; however, many of these fish were probably aurally stocked in several of the headwater lakes within the watershed and subsequently those fish have been able to migrate downstream but not back upstream. Due to the presence of dispersed permanent barriers and the relatively short distance of potential LCT habitat, Green Creek is listed as a low candidate for restoration.

Virginia Creek provides 2.6 miles of potential LCT habitat between Sites 1 and 19 (Map 16). The habitat between Sites 1 and 19 is characterized a low gradient with long riffles, several pocket pools as well as large pools that create good fish habitat. Although the section of stream surveyed contained no barriers and provides fish habitat, the majority of Virginia Creek occurs downstream of Site 1 on non National Forest lands, and therefore was not surveyed. A fish barrier may occur downstream of Site 1. Although the section surveyed provides fish habitat, due to such easy access, and the popularity Virginia Creek has for camping and fishing, Virginia Creek is listed as a low candidate for restoration. Stocking a put-and-take recreational LCT fishery into Virginia Creek should be considered.

Dunderberg Creek provides 3.6 miles of potential LCT habitat between Sites 1 and 13, and between Sites 5 and 29 (Map 17). The area upstream of Site 29 is not considered potential LCT habitat due to low water levels and the lack of pools present in this section. Dunderberg Creek is being impacted by several water diversions. The pond at Site 23 is artificially created and the water flowing from Site 23 down to Site 5 is in an artificially constructed channel. The section of stream between Sites 7 and 23 appears to be where the creek flowed historically. These diversions at Sites 7, 14, 16, 17, and 23 should be investigated to ensure that fish are not subject to terminal trips into irrigated pasture, and similarly ensure that water users are staying within the confines of their adjudicated rights. The areas that were identified as potential LCT habitat are characterized as having good pools, riffles, and well vegetated riparian areas. Due to the relatively short distance of potential LCT habitat that Dunderberg Creek offers, the impacts from diversions, and the inability to restore a metapopulation Dunderberg Creek is listed as a low candidate for restoration.

Sario Canyon and Patterson Creeks were both dry at the time of survey and therefore offer no potential LCT habitat.

**Lower West Walker Watershed** (West Walker River, Desert Creek, Jackass Creek, East Fork Desert Creek, Mill Creek, Lost Cannon Creek, East Fork Lost Cannon Creek, Rock Creek, Deep Creek, Cottonwood Creek, Driveway Creek, Burcham Creek)

The West Walker River provides 36 miles of potential LCT habitat between Sites 1 and 68 (Maps 18-21). Almost the entire stretch that was surveyed is either managed by the U.S. Forest Service, Bridgeport Ranger District or the California Department of Fish and Game. A small parcel of private land is located west of the bridge crossing at Site 15. The habitat between Sites 1 and 18 is a large canyon where the water flows very swiftly and is paralleled by Hwy 395. This area of the stream receives heavy use by visitors fishing, camping, and parking at day use areas. Upstream of Site 18 the habitat changes drastically and flows through two large meadow systems where the water is very flat and is allowed to meander. The majority of Pickle Meadows is managed by California Department of Fish and Game as a Wildlife and Trout Reserve with a parking area available at the west end of the

meadow off Hwy 108. Upstream from Pickle Meadows is Leavitt Meadows which is managed by the U.S. Forest Service. Upstream of Site 36 the river flows through the Hoover Wilderness. Beyond this point the stream is less influenced by humans and flows in a more natural state. The habitat through this section varies from wide slow sections to steep canyon sections that contain long riffles, runs and pools. As the river reaches deeper into the Hoover Wilderness more and more barriers are found with the largest barrier measuring approximately 12m tall at Site 40. From the survey start point at Site 1, fish are able to move freely upstream to Site 27. Sites 27 and 28 are both naturally occurring permanent fish passage barriers. Both of these barriers are located just downstream from the Leavitt Creek confluence. Between the Leavitt Creek confluence and the Long Canyon Creek confluence four more permanent fish passage barriers are found thus breaking up the watershed. Upstream of the Long Canyon Creek confluence approximately 6.5 miles of potential barrier free LCT habitat exist through Piute Meadows. In summary, restoring fish to the West Walker River downstream of Sites 27 and 28 should be considered a high priority. The widespread presence of non-native salmonids in the West Walker River and its many tributaries prevents any immediate reintroduction of LCT into the mainstem, unless LCT are stocked as a put-and-take recreational fishery. The ability of LCT to successfully persist with the presence of non-native salmonids within a large river system is unknown at this time. In small tributary streams we do know that LCT are unable to persist successfully in the presence of non-native salmonids.

The Desert Creek drainage, which also includes Jackass Creek and the East Fork Desert Creek, provides an opportunity for restoring a metapopulation of Lahontan cutthroat trout. Desert Creek provides 18.5 miles of potential LCT habitat between Sites 1 and 25, Jackass Creek provides 1.1 miles of potential LCT habitat, and the East Fork of Desert Creek provides an additional 3 miles of potential LCT habitat (Map 22). One artificial permanent fish barrier was found on Desert Creek at Site 1, and one naturally occurring permanent barrier was found on the East Fork of Desert Creek at Site 28. Non-native fish were seen throughout the watershed. The number of pools, riffles, large-woody-debris, stable banks, etc. appeared to be in good condition. Of the 3 miles on the East Fork of Desert Creek, approximately 1.5 miles is accessible to fish in Desert Creek. The other 1.5 miles is upstream of the permanent barrier. Because of the opportunity to create a metapopulation of LCT in the Desert Creek drainage, the presence of few barriers and the large number of miles that provide potential LCT habitat all three streams are considered high candidates for restoration. Desert Creek as well as Deep Creek flow out of Lobdell Lake. Lobdell Lake needs to be surveyed to determine if a metapopulation of LCT could be established between Desert and Deep Creeks.

Deep Creek and Cottonwood Creeks also provide an opportunity for restoring a metapopulation of LCT in the area. Deep Creek offers a minimum of 6.4 miles of potential LCT habitat (Map 26) while Cottonwood Creek, a tributary of Deep Creek, offers another 5.5 miles of potential habitat (Map 27). Although not surveyed, Deep Creek may provide an additional 2-2.5 miles of potential LCT habitat upstream of Site 16. Although there are four barriers present on Deep Creek, only one of them is

considered permanent as the others should be passable during higher water flows. There were no barriers located on Cottonwood Creek. Although the survey followed the South Fork of Cottonwood Creek due to higher water levels, there is a possibility of the North Fork adding some additional habitat. Water levels at the North and South Fork confluence indicate that any additional habitat on the North Fork of Cottonwood Creek would be minimal. Due to a permanent barrier being found at Site 11 on Deep Creek, roughly half of the Deep Creek watershed would be accessible to fish in Cottonwood Creek. Of the 6.4 miles of potential LCT habitat that Deep Creek offers, 3.5 miles is downstream of the barrier. That 3.5 miles combined with the 5.5 miles in Cottonwood Creek may function as an LCT metapopulation. Based on this metapopulation opportunity, Deep and Cottonwood Creeks are listed as high candidates for restoration.

The Lost Cannon Creek watershed provides 11.9 miles of potential LCT habitat (Map 24). The overall gradient of Lost Cannon Creek between Site 1 and Site 32 is 6.8%. Three out of the five permanent fish barriers occur at either the top or bottom of the Lost Cannon Creek watershed. Two permanent and two seasonal fish barriers occur within the middle of the watershed. Despite the large number of fish barriers, non-native fish were seen throughout the watershed. The number of pools, riffles, large-woody-debris, stable banks, etc. appeared to be in good condition. Although a large number of fish barriers were identified, based on all the other habitat characteristics mentioned above in this paragraph, the Forest Service personnel who conducted this survey still determined that the Lost Cannon Creek watershed does provide potential LCT habitat. Although Lost Cannon Creek provides several miles of potential LCT habitat, because of the barriers if LCT were introduced into Lost Cannon Creek, the LCT there would be physically and genetically isolated. Due to the inability to restore a metapopulation of LCT, but because of the relatively large number of miles that provide potential LCT habitat, Lost Cannon Creek is listed as a medium candidate for restoration.

Mill Creek (Map 23) supports an introduced population of LCT. A permanent fish barrier does exist on Mill Creek just upstream of the Mill Creek-Lost Cannon Creek confluence. Due to the permanent fish barrier on Mill Creek and the permanent fish barrier on Lost Cannon Creek at Site 2, establishing a metapopulation of LCT between Mill and Lost Cannon Creek is not possible. For additional information regarding actual population densities and population trends in Mill Creek, refer to the individual Mill Creek stream habitat survey report.

The Rock Creek watershed does not provide potential LCT habitat (Map 25). The overall gradient of Rock Creek between Site 1 and Site 25 is 8.3%. Five permanent and eleven seasonal fish barriers were identified within the Rock Creek watershed. If LCT were introduced into the Rock Creek watershed, the large number of seasonal and permanent fish barriers would likely result in negative impacts to fish survival, migration, and reproduction. Driveway Creek and Burcham Creek were both dry at the time of survey and therefore also offer no potential habitat.

**Little Walker River Watershed** (Little Walker River, Molybdenite Creek, Cowcamp Creek, and Poison Creek)

In the Upper West Walker River watershed, the Little Walker River drainage which includes Cowcamp Creek, Poison Creek and Molybdenite Creek, provide an opportunity for restoring a metapopulation of Lahontan cutthroat trout. Cowcamp, Poison and Molybdenite Creeks are all tributaries to the Little Walker River. The Little Walker River provides 10.4 miles of potential LCT habitat between Sites 1 and 22 (Map 28). Although three permanent fish barriers occur at Sites 14, 15, and 17, upstream of Site 17 the Little Walker River flows through Burt Canyon which offers some good slow water, meandering habitat. Of the 10.4 miles, 7.2 miles is downstream of the first barrier found at Site 14. The reach between Site 1 and Site 13 also offers some excellent habitat and a good combination of fast water and deep pools. Between Sites 8 and 13 the Little Walker River meanders for several miles through large meadows at Willow Flats. The reach in Willow Flats offers varying water depth and speed, cut banks, beaver ponds, and adequate in-stream cover. Cowcamp Creek adds an additional 1.6 miles of barrier free potential LCT habitat to the Little Walker River drainage (Map 29). Poison Creek also offers an additional 2.8 miles of potential LCT habitat (Map 30). Along this 2.8 mile stretch there are three seasonal fish barriers; two natural and one artificial. During high water volumes fish will be able to move freely throughout the stream. Molybdenite Creek also offers an additional 7.1 miles of potential LCT habitat (Map 31). Up to an additional 1.8 miles of potential LCT habitat may exist directly upstream of Site 17 on Molybdenite Creek. This area was not surveyed due to the abundance and depth of snow at the time of the survey. Molybdenite Creek provides several different types of habitat which would be suitable for LCT. Between Site 1 and Site 3 the stream is moving extremely fast with few pools as the stream flows through a small canyon. The culvert at Site 3 is an artificial fish barrier probably inhibiting fish passage seasonally. Upstream of Site 3 the stream has a lower gradient and a large amount stream cover. Beaver ponds are present in a large meadow between Sites 13 and 15. In summary, the Little Walker River drainage and its tributaries offer at minimum 19 miles of barrier free metapopulation habitat. For all the reasons mentioned above, the Little Walker River, Molybdenite Creek, Poison Creek, and Cowcamp Creek are all listed as high candidates for restoration in Table 2.

**Upper West Walker Watershed** (West Walker River, Silver Creek, Kirman Creek, Poore Creek, Wolf Creek, Leavitt Creek, Sardine Creek, McKay Creek, West Fork West Walker River, Long Canyon Creek)

Leavitt Creek offers approximately 1.1 miles of potential LCT habitat between the fork at Site 5 and its two confluences with the West Walker River (Map 35). Between Sites 5 and 23 eight different fish passage barriers were documented. The barrier at Site 7, known as Leavitt Falls, is a naturally occurring permanent fish passage barrier that is approximately 115-131 feet high. The section of stream between Sites 5 and 23 does not provide potential LCT habitat because of the high gradient, and the large number of barriers would cause LCT to be physically and

genetically isolated. Lahontan cutthroat trout within this section of stream would not be able to persist long-term. Leavitt Lake is aerially stocked with non-native fishes. These fish are able to swim downstream and occupy small isolated pools, but are unable to migrate back upstream to the lake. Due to the relatively short distance of potential LCT habitat and the presence of several barriers, Leavitt Creek is listed as a low candidate for restoration.

Sardine Creek, a tributary of Leavitt Creek, offers 2.7 miles of potential LCT habitat between Sites 7 and 18 (Map 36). The area downstream of Site 7 is considered unsuitable habitat because of the numerous waterfalls that are located throughout this section. McKay Creek is a small tributary to Sardine Creek. McKay Creek offers 0.9 miles of potential LCT habitat between Sites 1 and 6 (Map 37). This section of the stream is low gradient as the stream passes through Sardine Meadows. The creek passes through a combination of open meadow lands and a low lying pine forest. The area identified as potential habitat flows over a rocky stream bed with frequent pools of slower water. At Site 6 there is a large waterfall that was estimated to be around 7m tall and forms a permanent fish barrier. The survey ended at Site 10 due to the presence of Sardine Falls at Site 9. Sardine Falls is approximately 75 feet high. McKay and Sardine Creeks combined offer 3.6 miles of potential LCT habitat. Although both of these streams provide an opportunity for restoring a small metapopulation of LCT, due to the relatively short distance (3.6 miles) and high elevation of both streams, Sardine and McKay creeks are both listed as low candidates for restoration.

Poore Creek offers 2.6 miles of potential LCT habitat between Sites 1 and 12 (Map 33). Although the 1 mile of stream between Site 1 and Site 2 was not surveyed, after reviewing a topographic map, that 1 mile section of stream would probably provide potential LCT habitat. Site 6 has a 33 foot high naturally occurring waterfall. Poore Creek receives its flows from Poore Lake. Poore Lake has an artificial dam/dike system (Site 12) thus controlling the amount of flow in Poore Creek. Stocked fish in Poore Lake appear to be able to exit the lake into the stream, but then are not able to re-enter the lake swimming back upstream. Due to the relatively short distance, and the barriers at Sites 6 and 12, Poore Creek is listed as a low candidate for restoration.

Silver Creek provides 3.3 miles of occupied LCT habitat (Map 32). An unexpected population of non-native brook trout was found in Silver Creek. Brook trout have dispersed throughout the Silver Creek watershed between the upper natural barrier and Reach 2 Unit 3. While conducting this survey brook trout were spawning. Approximately 450 brook trout ranging from 2 to 10 inches in total length were captured between the upper natural barrier and Reach 2 Unit 3 thus indicating a large self-sustaining population of brook trout in Silver Creek. Lahontan cutthroat trout are unlikely to extend their distribution upstream of Reach 2 Unit 3 due to higher elevation, colder water temperatures, increased gradient, and lower water flows. The large number of brook trout present between the upper natural barrier and the Marines bridge may be the reason why only 2 LCT were found within that area. The area between the upper natural barrier and the Marines bridge is suitable habitat for

LCT. The large self sustaining population of brook trout is negatively impacting LCT survival in Silver Creek. Brook trout are known to prey upon and out-compete LCT for resources. Cold water temperatures may also have a potentially negative impact on LCT survival in Silver Creek. In 2003-2004 water temperatures were near zero for approximately 5 months during the year. Stream habitat conditions in Silver Creek between the upper natural barrier and Reach 2 unit 3 are fairly good. Typical habitat consisted of riffles, pools, large boulders, several pieces of large woody debris in the stream, well vegetated stream banks, some good undercut cover, and not many bare or eroding banks. For additional information regarding actual population densities and population trends in Silver Creek, refer to the individual Silver Creek stream habitat survey report.

Wolf Creek is also currently occupied by LCT (Map 34). The distribution of LCT within the Wolf Creek watershed is limited to approximately 3.2 miles of Wolf Creek. Lahontan cutthroat trout are unlikely to extend their distribution downstream of Reach 1 Unit 3 due to increased gradient. However, LCT could likely extend their distribution upstream of Reach 3 Unit 4 to Reach 4 Unit 1 if flows increased. Lahontan cutthroat trout are unlikely to extend their distribution upstream of Reach 4 Unit 1 due to increased gradient. Habitat conditions in Wolf Creek between the natural barrier and Reach 4 Unit 1 are fairly good. Typical habitat consisted of riffles, pools, several pieces of large woody debris in the stream, well vegetated stream banks, some good undercut cover, and not many bare or eroding banks. Although only one area was noted for having unstable banks, a large amount of sediment in the stream was still noted several times while conducting the survey. The source of this sediment is unknown. Just upstream of Reach 3 Unit 1 a 12 foot high waterfall was documented. Lahontan cutthroat trout may be able to get around this waterfall at certain times of the year through an adjacent side channel. For additional information regarding actual population densities and population trends in Wolf Creek, refer to the individual Wolf Creek stream habitat survey report.

The West Fork of the West Walker River offers 3.6 miles of potential LCT habitat between Sites 1 and 5 and between Sites 16 and 26 (Maps 38 and 39). These two sections of stream are characterized as lower gradient, slow water meandering habitat, with deep pools and nice riffles. Although the section of stream between Sites 16 and 26 provides fish habitat, permanent fish barriers are located upstream and downstream; therefore, introducing LCT into this section of stream would probably not be warranted because the introduced fish there would be physically and genetically isolated. Due to the relatively short distance and the presence of several barriers, the West Fork of the West Walker River is listed as a low candidate for restoration.

Long Canyon Creek offers 3.1 miles of potential LCT habitat between Sites 13 and 22 (Map 40). Between Sites 7 and 13 Long Canyon Creek has several permanent fish barriers. Above this very steep section; however, is a network of large meadows where the stream meanders freely and provides a good combination of different habitats for fish. During the survey several fish were spotted in large groups

numbering up to 15 fish at different locations. The fish in Long Canyon Creek probably came from being aerially stocked in Beartrap Lake. Although Long Canyon Creek does provide 3.1 miles of potential LCT habitat, any LCT that were introduced would be physically and genetically isolated. Fish would be able to move downstream to the West Walker River, but would not be able to migrate back upstream. For these reasons, Long Canyon Creek is listed as a low candidate for restoration.

Kirman Creek was dry at the time of survey and therefore does not offer any potential habitat.

## **Recommendations**

### **Bodie Creek (Map 5)**

1. Consider the entire 10.1 mile section of Bodie Creek between Site 1 and Site 20 as potential LCT habitat and consider Bodie Creek a high candidate for restoration. Consider the 6.4 mile section of Bodie Creek between Site 7 and Site 20 to be the best habitat within that 10.1 mile section. Bodie Creek in conjunction with Rough Creek could contribute towards restoring an LCT metapopulation in the area.
2. If permission can be obtained, conduct a stream habitat survey on the 1 mile of Bodie Creek directly downstream of Site 1 and on the 6.3 miles directly upstream of Site 20 to determine if additional LCT habitat exists.
3. Utilize signs and physical barriers to encourage OHV users to stay on designated routes.
4. Further investigate the road-stream crossings that have bridges to determine if the bridges are stable and meet all safety codes.
5. Further investigate the culverts at Sites 8, 15 and 17 to determine if fish passage at those locations is being inhibited seasonally. If any of the culverts are inhibiting fish passage, alter the site to accommodate fish passage.

### **Buckeye Creek (Map 11)**

1. Consider Buckeye Creek to have 10.5 miles of potential LCT habitat located between Site 1 and Site 29 and consider Buckeye Creek a medium candidate for restoration. The most favorable LCT habitat occurs between Sites 1 and 22, and between Sites 25 and 27.
2. Increase public awareness of Leave-No-Trace principles along Buckeye Creek, (i.e.) more signs at Buckeye Campground and at the main trailhead.
3. Close and decommission all dispersed campsites within 100 feet of Buckeye Creek. Only allow camping to occur more than 100 feet away from the stream edge.
4. Further investigate the impact Buckeye Campground is having on the fisheries habitat and water quality in Buckeye Creek.
5. Investigate if/what impacts are occurring as a result of the irrigation channel located at Site 8 and if/what impacts are occurring as a result of using the tributary at Site 13 for irrigation. Ensure that water users are staying within the confines of their adjudicated rights.

### **By-Day Creek (Map 10)**

1. Conduct an R1R4 habitat survey on By-Day Creek. This survey will provide pool to riffle ratios. If pools are lacking, implement the appropriate actions to provide LCT with additional pool habitat.

2. Conduct another similar LCT distribution and population survey by fall 2009. Monitor LCT response to altering the rock gabion barriers (Figures 24 & 28) and to the bridge construction.
3. Conduct electrofishing surveys in the upper reaches of the North and South Forks to determine whether LCT are still present from the 1982 transplant.
4. Figure 29 is a rock gabion structure that does not currently appear to be a fish barrier; however, this structure needs to be continually monitored.
5. Maintain Forest System Road 32076 to minimize erosion impacts on By-Day Creek.
6. Implement actions consistent with the conclusions made from the recent genetic analysis.

#### Cattle Creek (Map 14)

1. Consider the 2.41 mile section between Site 7 and Site 15 as potential LCT habitat and consider Cattle Creek a low candidate for restoration.

#### Cottonwood Creek (Map 27)

1. Consider the 5.53 mile section of Cottonwood Creek between Sites 1 and 13 as potential LCT habitat and consider Cottonwood Creek a high candidate for restoration. Cottonwood Creek in conjunction with Deep Creek could contribute towards restoring an LCT metapopulation in the area.

#### Cowcamp Creek (Map 29)

1. Consider the 1.6 mile section between Sites 1 and 6 as potential LCT habitat and consider Cowcamp Creek a high candidate for restoration. Cowcamp Creek in conjunction with the Little Walker River and two additional tributaries could contribute towards restoring an LCT metapopulation in the area.
2. Assess the efficiency and impact of the diversion at Site 6 making sure it is not diverting a quantity of water that exceeds the adjudicated rights.
3. Obtain permission from the private land owner to conduct a stream habitat survey between Sites 4 and 5.

#### Deep Creek (Map 26)

1. Consider the 6.34 mile section of Deep Creek between Sites 1 and 16 as potential LCT habitat and consider Deep Creek a high candidate for restoration. Deep Creek in conjunction with Cottonwood Creek could contribute towards restoring an LCT metapopulation in the area.
2. Conduct a stream habitat survey on the 2 ½ mile section upstream of Site 16.

#### Desert Creek (Map 22)

1. Consider the 18.5 mile stretch between Site 1 and Site 25, the lower 1.1 miles of Jackass Creek, and the lower 3 miles of East Fork Desert Creek to be potential LCT habitat and consider Desert Creek to be a high candidate for restoration. Desert Creek in conjunction with its tributaries could contribute towards restoring an LCT metapopulation in the area.
2. Work with California Department of Fish and Game and Nevada Department of Wildlife to obtain stocking records and information related to previous density and distribution surveys of fish in Desert Creek.
3. Desert Creek is diverted at Site 1. The artificial permanent fish barrier only occurs on one side of the diversion. Contact the private land owner to determine if a permanent fish barrier occurs on the other side of the diversion. Investigate the artificial permanent barrier to determine if restoring fish passage at that site is warranted.
4. Assess the erosion/sediment impacts from all the ford-road crossings and implement the necessary actions to reduce the erosion/sediment impacts to the watershed and the fish.
5. Assess the water right issues at Lobdell Lake and develop a recommendation that will support recovery of LCT.
6. Survey Lobdell Lake to determine if a metapopulation of LCT could be established between Desert, Deep, and Cottonwood Creeks.

#### Dunderberg Creek (Map 17)

1. Consider Dunderberg Creek to provide 3.6 miles of potential LCT habitat located between Sites 1 and 13, and between Sites 5 and 29 and consider Dunderberg Creek a low candidate for restoration.
2. Coordinate with the private land owner to conduct a stream habitat survey on the section of Dunderberg Creek between its confluence with Virginia Creek and the National Forest-private property boundary at Site 1.
3. Investigate the destination and impacts of the diversions at Sites 7, 14, 16, 17 and 23. Ensure that fish are not subject to terminal trips into irrigated pasture, and similarly ensure that water users are staying within the confines of their adjudicated rights.

#### Eagle Creek (Map 12)

1. Consider the Eagle Creek watershed as not having any potential LCT habitat.

#### East Walker River (Maps 1-3)

1. Consider the entire 32.5 mile section of the East Walker River between Sites 1 and 59 as potential LCT habitat and consider the East Walker River a high candidate for restoration.

2. Make information regarding Leave No Trace ethics more visible to the public. Decommission infrequently used campsites and encourage users to camp at least 100 feet from the river.
3. Talk with private land owners located along the river about the presence of barbed wire fencing that spans the river at several locations. Determine if these are appropriate and whether they are inhibiting recreational use of the river.
4. Investigate the destination and impacts of the diversions at Sites 4 and 6, and if possible the diversions that occur between Sites 41 and 42. Ensure that fish are not subject to terminal trips into irrigated pasture, and similarly ensure that water users are staying within the confines of their adjudicated rights.
5. Eliminate noxious weeds (cheat grass and whitetop) where herbicides can be safely applied.
6. Consider stocking LCT into the East Walker River as a put-and-take recreational fishery.

#### Fryingpan Creek (Map 6)

1. Consider Fryingpan Creek to provide 3.6 miles of potential LCT habitat between Sites 1 and 12 and consider Fryingpan Creek a low candidate for restoration.
2. Further evaluate the artificial fish barrier at Site 2 to determine if it's a seasonal or permanent fish barrier. Also evaluate how reasonable/difficult it would be to restore fish passage at that site.
3. Investigate the destination and impacts of the diversion at Site 4. Ensure that fish are not subject to terminal trips into irrigated pasture, and similarly ensure that water users are staying within the confines of their adjudicated rights.

#### Green Creek (Map 15)

1. Consider Green Creek to provide 2.4 miles of potential LCT habitat between Site 1 and Site 7 and consider Green Creek a low candidate for restoration.
2. If permission can be obtained, conduct a stream habitat survey on Green Creek directly downstream of Site 1 on the California State land and on the lands managed by the Bureau of Land Management to determine if additional LCT habitat exists within the watershed.
3. Conduct a stream habitat survey on the East Fork of Green Creek to determine if additional LCT habitat exists within the watershed.
4. Work with the California Department of Fish and Game to obtain stocking records and information related to previous density and distribution surveys of fish in Green Creek.
5. Increase public awareness of Leave-No-Trace principles along Green Creek, (i.e.) more signs at Green Creek Campground and at the main trailhead.
6. Close and decommission all dispersed campsites within 100 feet of Green Creek. Only allow camping to occur more than 100 feet away from the streams edge.
7. Further investigate the impact Green Creek Campground is having on fish habitat and the water quality in Green Creek.

#### Huntoon Creek (Map 9)

1. Consider the entire 3.1 mile section of Huntoon Creek between Site 1 and Site 6 as potential LCT habitat and consider Huntoon Creek a medium candidate for restoration.

#### Leavitt Creek (Map 35)

1. Consider the 0.6 miles of Leavitt Creek located between Sites 1 and 5 and the 0.5 miles located between Sites 24 and 5 as potential LCT habitat. Consider Leavitt Creek a low candidate for restoration.
2. Increase public awareness of Leave-No-Trace principles along Leavitt Creek, (i.e.) more signs at Leavitt Lake.
3. Close and decommission all dispersed campsites within 100 feet of Leavitt Creek. Only allow camping to occur more than 100 feet away from the stream's edge.
4. Investigate the impacts of the irrigation diversion located at Site 26. Ensure that fish are not subject to terminal trips towards Leavitt Meadows Pack Station, and similarly ensure that the water users are staying within the confines of their adjudicated rights.

#### Little Walker River (Map 28)

1. Consider the 10.4 mile section of the Little Walker River located between Site 1 and Site 21 as potential LCT habitat and consider the Little Walker River a high candidate for restoration. The Little Walker River has three tributaries (Cowcamp, Poison and Molybdenite Creeks) that also provide potential LCT habitat; therefore, making the Little Walker River watershed a high candidate for restoring an LCT metapopulation.
2. If permission can be obtained, conduct a stream habitat survey on the 3 miles of the Little Walker River directly downstream of Site 1 to determine if additional LCT habitat exists. At a different time of year when the snow has melted, also consider doing a stream habitat survey on the 1.6 miles of the Little Walker River directly upstream of Site 21 to determine if additional LCT habitat exists.
3. Work with the California Department of Fish and Game to determine past stocking efforts in the Little Walker River and to get an idea of present populations of fish in the river system.
4. Remove the abandoned culverts located at Site 4.

#### Long Canyon Creek (Map 40)

1. Consider the 3.1 mile section of Long Canyon Creek between Sites 13 and 22 as potential LCT habitat and consider Long Canyon Creek a low priority for restoration.
2. Close and decommission all dispersed campsites within 100 feet of Long Canyon Creek. Only allow camping to occur more than 100 feet away from the streams edge.

#### Long Valley Creek (Map 8)

1. Consider the 1.87 mile section of Long Valley Creek between Site 1 and Site 5 as potential LCT habitat and consider Long Valley Creek a medium candidate for restoration.

#### Lost Cannon Creek (Map 24)

1. Consider the 7.5 mile section on Lost Cannon Creek and the 2.2 mile section on the East Fork Lost Cannon Creek between Site 1 and Site 32 as potential LCT habitat. Consider the Lost Cannon Creek watershed a medium candidate for restoration.
2. Work with California Department of Fish and Game to obtain stocking records and information related to previous density and distribution surveys of fish in Lost Cannon Creek.
3. The Mountain Warfare Training Center (MWTC) trains within the Lost Cannon Creek watershed. Discuss with the MWTC their interest in restoring the Lost Cannon Creek watershed to LCT.
4. A few parcels of private land occur within the Lost Cannon Creek watershed. Discuss with the private land owners their interest in restoring the Lost Cannon Creek watershed to LCT.

#### McKay Creek (Map 37)

1. Consider the 0.9 miles of McKay Creek located between Sites 1 and 6 as potential LCT habitat and consider McKay Creek a low candidate for restoration.
2. Close and decommission all dispersed campsites within 100 feet of McKay Creek. Only allow camping to occur more than 100 feet away from the streams edge.

#### Mill Creek (Map 23)

1. Conduct another electrofishing LCT distribution and population survey by fall 2009.
2. Maintain Forest System Road 32028 to minimize erosion impacts on Mill Creek.
3. Decommission all campsites within 100 feet of Mill Creek to reduce erosion impacts.
4. Monitor water temperature within the Mill Creek watershed.
5. Monitor beaver activity within the Mill Creek watershed.
6. Implement actions consistent with the conclusions made from the recent genetic analysis.
7. Restore fish passage at the irrigation diversion site located on the CDFG land.
8. Close Forest System Road 32028 just before the upper ford stream crossing to protect LCT habitat.

### Molybdenite Creek (Map 31)

1. Consider the entire 7.1 miles (Sites 1-17) of Molybdenite Creek as potential LCT habitat and consider Molybdenite Creek a high candidate for restoration. Molybdenite Creek in conjunction with the Little Walker River, Poison Creek, and Cowcamp Creek could contribute towards restoring an LCT metapopulation in the area.
2. At a different time of year when the snow has melted, consider conducting a stream habitat survey on the 1.8 miles of Molybdenite Creek directly upstream of Site 17 to determine if additional LCT habitat exists.
3. Further evaluate the culvert at Site 3 to determine if it prohibits fish passage seasonally. If the culvert is inhibiting fish passage, alter the site to accommodate fish passage.
4. Evaluate if impacts to the stream, as a result of the Obsidian Campground, are occurring.

### Murphy Creek (Map 7)

1. Consider the 1.1 mile section of Murphy Creek between Sites 1 and 9 and the 1.7 mile section between Sites 14 and 16 as potential LCT habitat and consider Murphy Creek a low candidate for restoration.
2. Conduct a fish survey between Sites 14 and 16. If no non-native fish are found between Sites 14 and 16, consider stocking LCT into this section of stream to expand the distribution of LCT in Murphy Creek.
3. Conduct another similar electrofishing LCT distribution and population survey within Reach 1 by fall 2010.
4. The individual Murphy Creek stream habitat survey report and all the annual grazing monitoring reports since 1994 for the Murphy Creek C&H Allotment need to be compared and analyzed to determine how effective the grazing standards set forth in the 1994 Biological Opinion for the Murphy Creek C&H Allotment have been on protecting the LCT in Murphy Creek.
5. Monitor water temperature within the Murphy Creek watershed.
6. Implement actions consistent with the conclusions made from the recent genetic analysis.

### Poison Creek (Map 30)

1. Consider the 2.84 mile section of Poison Creek between Sites 1 and 11 as potential LCT habitat and consider Poison Creek a high candidate for restoration. Poison Creek in conjunction with the Little Walker River, Molybdenite Creek and Cowcamp Creek could contribute towards restoring an LCT metapopulation in that area.
2. Investigate the culvert at Site 7 to determine if the culvert is inhibiting fish passage seasonally. If the culvert is inhibiting fish passage, alter the site to accommodate fish passage.

### Poore Creek (Map 33)

1. Consider the 2.6 mile section of Poore Creek between Sites 1 and 12 as potential LCT habitat and consider Poore Creek a low candidate for restoration.
2. If permission can be obtained, conduct a stream habitat survey on the 1 mile of Poore Creek between Site 1 and Site 2 to confirm that this section of stream does provide potential LCT habitat.
3. Close and decommission all dispersed campsites within 100 feet of Poore Creek. Only allow camping to occur more than 100 feet away from the streams edge.
4. Investigate the water allocation and water management schedules for Poore Lake. If needed, pursue the possibility of allocating more water to flow into Poore Creek during the driest parts of the year (July-September).

### Robinson Creek (Map 13)

1. Consider the 2.6 mile section of Robinson Creek between Site 1 and Site 8 as potential LCT habitat and consider Robinson Creek a low candidate for restoration.
2. Work with the California Department of Fish and Game to obtain stocking records and information related to previous density and distribution surveys of fish in Robinson Creek.

### Rock Creek (Map 25)

1. Consider the Rock Creek watershed as not having any potential LCT habitat.

### Rough Creek (Map 4)

1. Consider the 10.5 mile section of Rough Creek between Site 1 and Site 22 (excluding Nine Mile Ranch private property) as potential LCT habitat and consider Rough Creek a high candidate for restoration. Consider the 4.7 mile section of stream between Site 13 and Site 22 to offer the most favorable habitat. Rough Creek in conjunction with Bodie Creek could contribute towards restoring an LCT metapopulation in the area.
2. If permission can be obtained, conduct a stream habitat survey on the 4 mile section of Rough Creek between Sites 7 and 8 on Nine Mile Ranch to confirm that this section of stream does provide potential LCT habitat. If this section of stream does provide potential LCT habitat, then Rough Creek would provide at least 14.5 miles of potential LCT habitat.
3. If permission can be obtained, conduct a stream habitat survey on the 7.5 mile section upstream of Site 22 on the private lands and on the lands managed by BLM to determine if additional LCT habitat exists.
4. Investigate the destination and impacts of the diversion located at Site 9. Ensure that fish are not subject to terminal trips into irrigated pasture, and similarly ensure that water users are staying within the confines of their adjudicated rights.

5. Decommission and or relocate the campsites at Sites 10 and 15 to a location at least 100 feet away from the stream.

#### Sardine Creek (Map 36)

1. Consider the 2.72 mile section of Sardine Creek located between Sites 7 and 18 as potential LCT habitat and consider Sardine Creek a low candidate for restoration.
2. Close and decommission all dispersed campsites within 100 feet of McKay Creek. Only allow camping to occur more than 100 feet away from the streams edge.

#### Silver Creek (Map 32)

1. Brook trout and LCT distribution and densities need to be continually monitored.
2. Implemented appropriate actions to reduce or eliminate the threats and impacts of brook trout on LCT.
3. Water temperature at different depths needs to be monitored.
4. All campsites within 100 feet of Silver Creek need to be decommissioned to reduce erosion impacts on LCT.
5. Waterbars need to be installed near the two culverts and near the Marines bridge to divert runoff and reduce sediment impacts on Silver Creek.
6. If LCT in the future are stocked into Silver Creek, consider restocking the LCT near Reach 1 Unit 3. Reach 1 Unit 3 occurs within a meadow habitat.
7. Implement actions consistent with the conclusions made from the recent genetic analysis.

#### Virginia Creek (Map 16)

1. Consider the 2.6 mile section of Virginia Creek between Site 1 and Site 19 as potential LCT habitat and consider Virginia Creek a low candidate for restoration.
2. Work with the California Department of Fish and Game to obtain stocking records and information related to previous density and distribution surveys of fish in Virginia Creek.
3. Increase public awareness of Leave-No-Trace principles along Virginia Creek, (i.e.) more signs at Virginia Lakes.
4. Close and decommission all dispersed campsites within 100 feet of Virginia Creek. Only allow camping to occur more than 100 feet away from the streams edge.
5. Consider stocking a put-and-take recreational LCT fishery into Virginia Creek.

#### West Fork West Walker River (Maps 38-39)

1. Consider the 3.6 miles of the West Fork of the West Walker River between Sites 1 and 5 and between Sites 16 and 26 as potential LCT habitat and consider the West Fork West Walker River a low candidate for restoration.

### West Walker River (Maps 18-21)

1. Consider the 36 mile section of the West Walker River between Sites 1 and 67 as potential LCT habitat and consider the West Walker River a high candidate for restoration.
2. Make regulations and Leave No Trace ethics more visible to the public. Decommission infrequently used campsites and encourage users to camp at least 100 feet from the river.
3. Investigate the destination and impacts of the diversion at Site 3. Ensure that fish are not subject to terminal trips into irrigated pasture, and similarly ensure that water users are staying within the confines of their adjudicated rights.
4. Consider stocking LCT into the West Walker River as a put-and-take recreational fishery.

### Wolf Creek (Map 34)

1. Conduct another similar electrofishing LCT distribution and population survey by fall 2009.
2. Maintain Forest System Road 042 to minimize erosion impacts on Wolf Creek.
3. Decommission all campsites within 100 feet of Wolf Creek to reduce erosion impacts.
4. Monitor water temperature within the Wolf Creek watershed.
5. Monitor beaver activity within the Wolf Creek watershed.
6. Implement actions consistent with the conclusions made from the recent genetic analysis.
7. If LCT in the future are stocked into Wolf Creek, consider restocking the LCT near Reach 2 Unit 4 or near Reach 3 Unit 3. Both units occur within meadow habitats.
8. Monitor amphibian populations at Wolf Creek Lake.
9. Work with the Mountain Warfare Training Center to minimize impacts and disturbance within all riparian areas (300 feet on each side of Wolf Creek and all tributaries).
10. Coordinate with the Mountain Warfare Training Center a “trash pickup day” within the Wolf Creek watershed.

- East Walker River
  - Rough Creek
    - Bodie Creek
      - Aurora Creek
  - Fryingpan Creek
  - Murphy Creek
  - Sario Canyon Creek
  - Long Valley Creek
    - Huntoon Creek
  - Patterson Creek
  - By-Day Creek
  - Buckeye Creek
    - Eagle Creek
  - Robinson Creek
  - Cattle Creek
  - Green Creek
  - Virginia Creek
    - Dunderberg Creek
  
- West Walker River
  - Desert Creek
    - Jackass Creek
    - East Fork Desert Creek
  - Mill Creek
    - Lost Cannon Creek
      - East Fork Lost Cannon Creek
  - Rock Creek
  - Deep Creek
    - Cottonwood Creek
  - Driveway Creek
  - Burcham Creek
  - Little Walker River
    - Cowcamp Creek
    - Poison Creek
    - Molybdenite Creek
  - Silver Creek
  - Kirman Creek
  - Poore Creek
  - Wolf Creek
  - Leavitt Creek
    - Sardine Creek
      - McKay Creek
  - West Fork West Walker River
  - Long Canyon Creek

**Table 1:** A summary of all the streams surveyed in the East and West Walker River watersheds. Indented streams denote that stream is a tributary to the upper referenced stream. Streams are listed in order starting from the furthest downstream on the East and West Walker Rivers and working upstream.

Restoration Potential	Stream Name	Miles of Potential LCT Habitat Identified
High Candidates for Restoration	East Walker River	32.5
	West Walker River	36
	Rough Creek	14.5
	Bodie Creek	10.1
	Little Walker River	10.4
	Molybdenite Creek	7.1
	Poison Creek	2.8
	Cowcamp Creek	1.6
	Desert Creek	18.5
	East Fork Desert Creek	3
	Jackass Creek	1.1
Medium Candidates for Restoration	Deep Creek	6.3
	Cottonwood Creek	5.5
	Buckeye Creek	10.5
	Long Valley Creek	1.9
Low Candidates for Restoration	Huntoon Creek	3.1
	Lost Cannon Creek	9.7
	Fryingpan Creek	3.6
	Virginia Creek	2.6
	Dunderberg Creek	3.6
	Green Creek	2.4
	Cattle Creek	2.4
	Robinson Creek	2.6
	Poore Creek	2.6
	Leavitt Creek	1.1
	Sardine Creek	2.7
	McKay Creek	0.9
	West Fork West Walker River	3.6
	Long Canyon Creek	3.1
	Eagle Creek	0
	Rock Creek	0
	Aurora Creek	Dry
Burcham Creek	Dry	
Driveway Creek	Dry	
Kirman Creek	Dry	
Patterson Creek	Dry	
Sario Canyon Creek	Dry	

**Table 2:** A summary of which streams are high, medium or low candidates for restoration and how much potential LCT habitat each stream provides. Colored streams are areas that provide metapopulation potential.

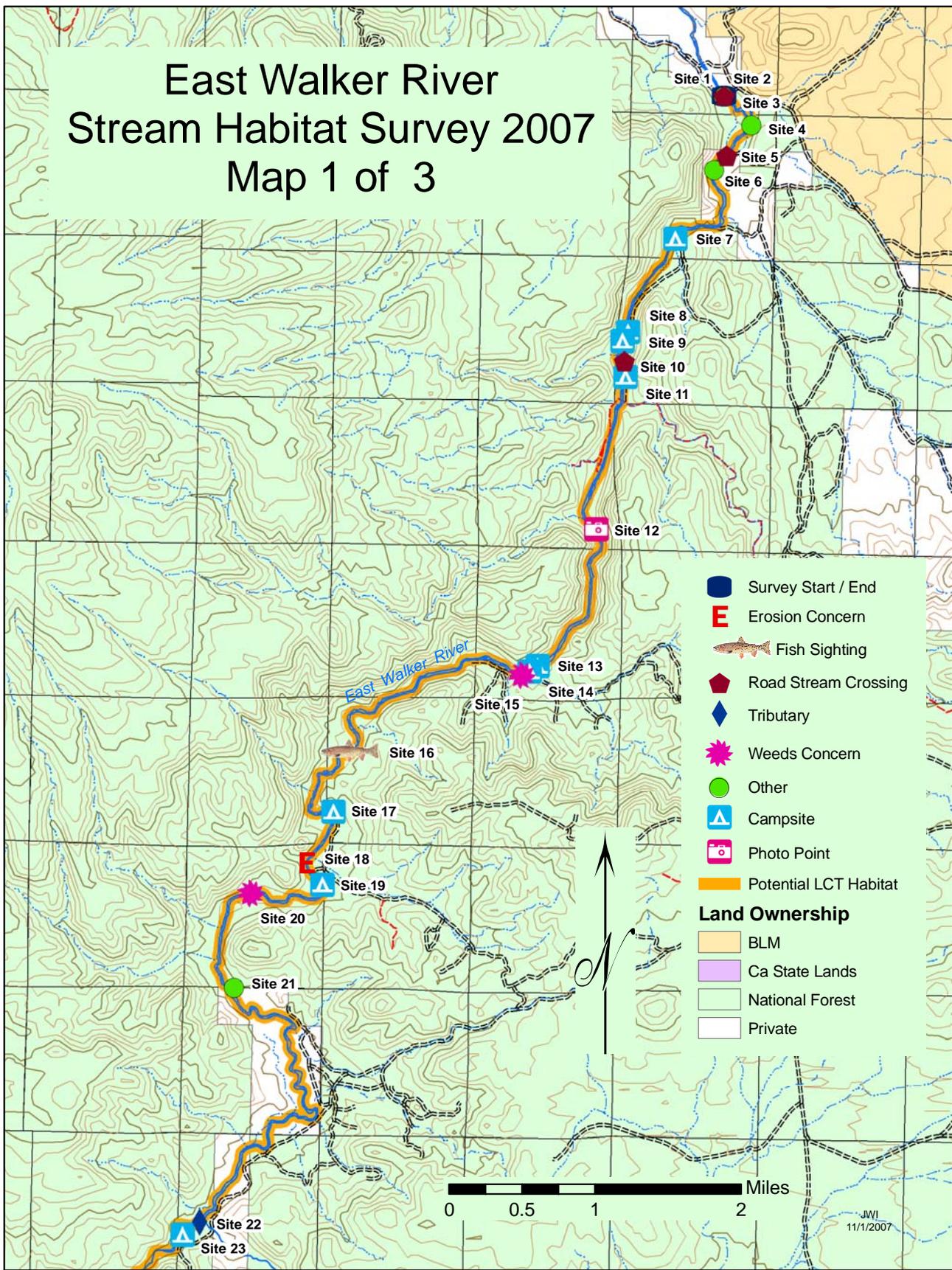
Stream Name	Miles of Potential LCT Habitat Identified	Miles of Occupied LCT Habitat Identified
Murphy Creek	2.8	2.8
By-Day Creek	2	1.1
Mill Creek	1.3	5.5
Silver Creek	0	3.3
Wolf Creek	0.7	3.2
Slinkard Creek	?	?

**Table 3:** A summary of how much occupied and potential LCT habitat each stream provides. By-Day Creek supports the only native population of LCT. Murphy, Mill, Silver, Wolf, and Slinkard Creeks support introduced populations of LCT.

## **Appendix I**

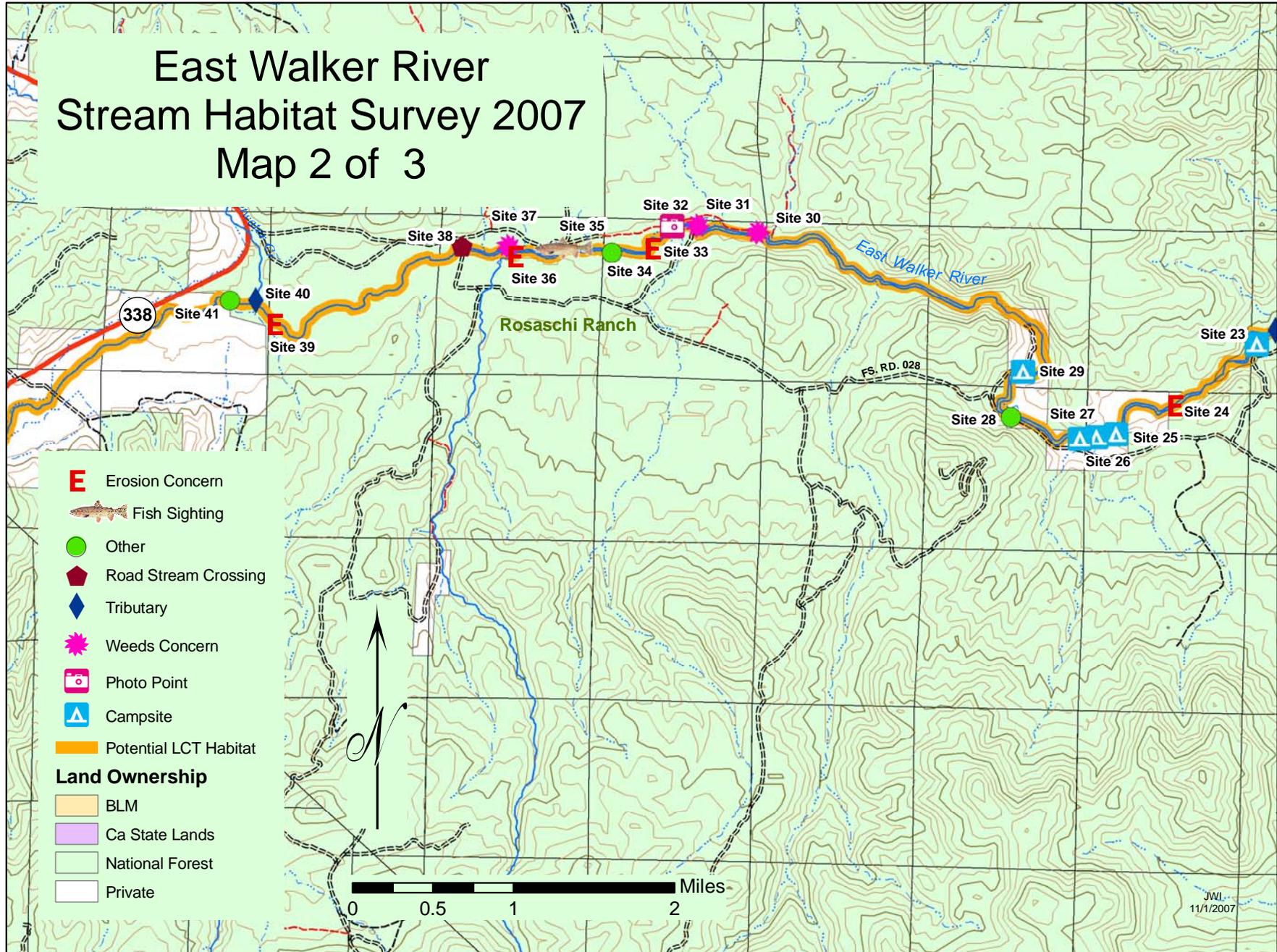
**Maps for each individual stream surveyed**

# East Walker River Stream Habitat Survey 2007 Map 1 of 3



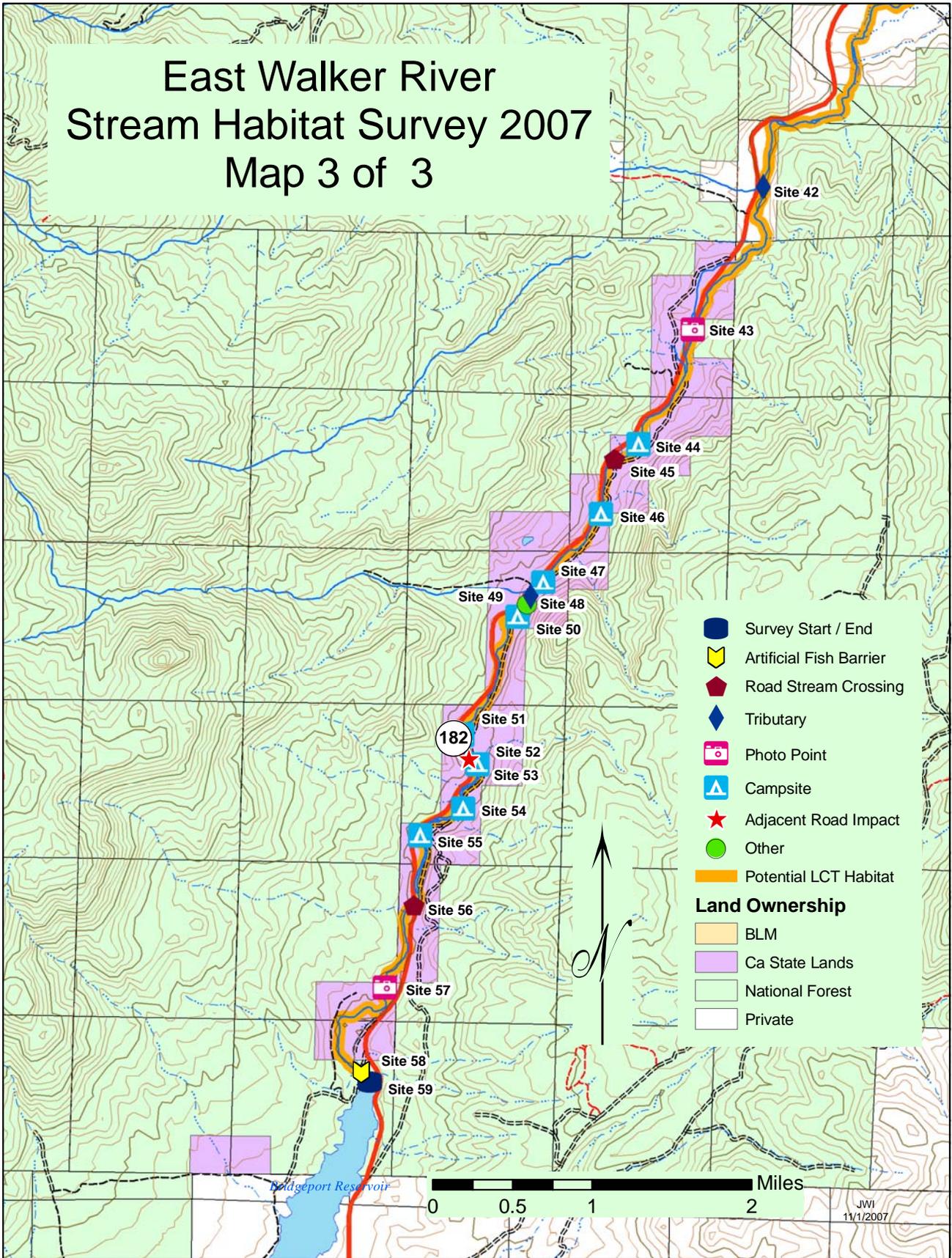
Map 1: Lower East Walker River

# East Walker River Stream Habitat Survey 2007 Map 2 of 3



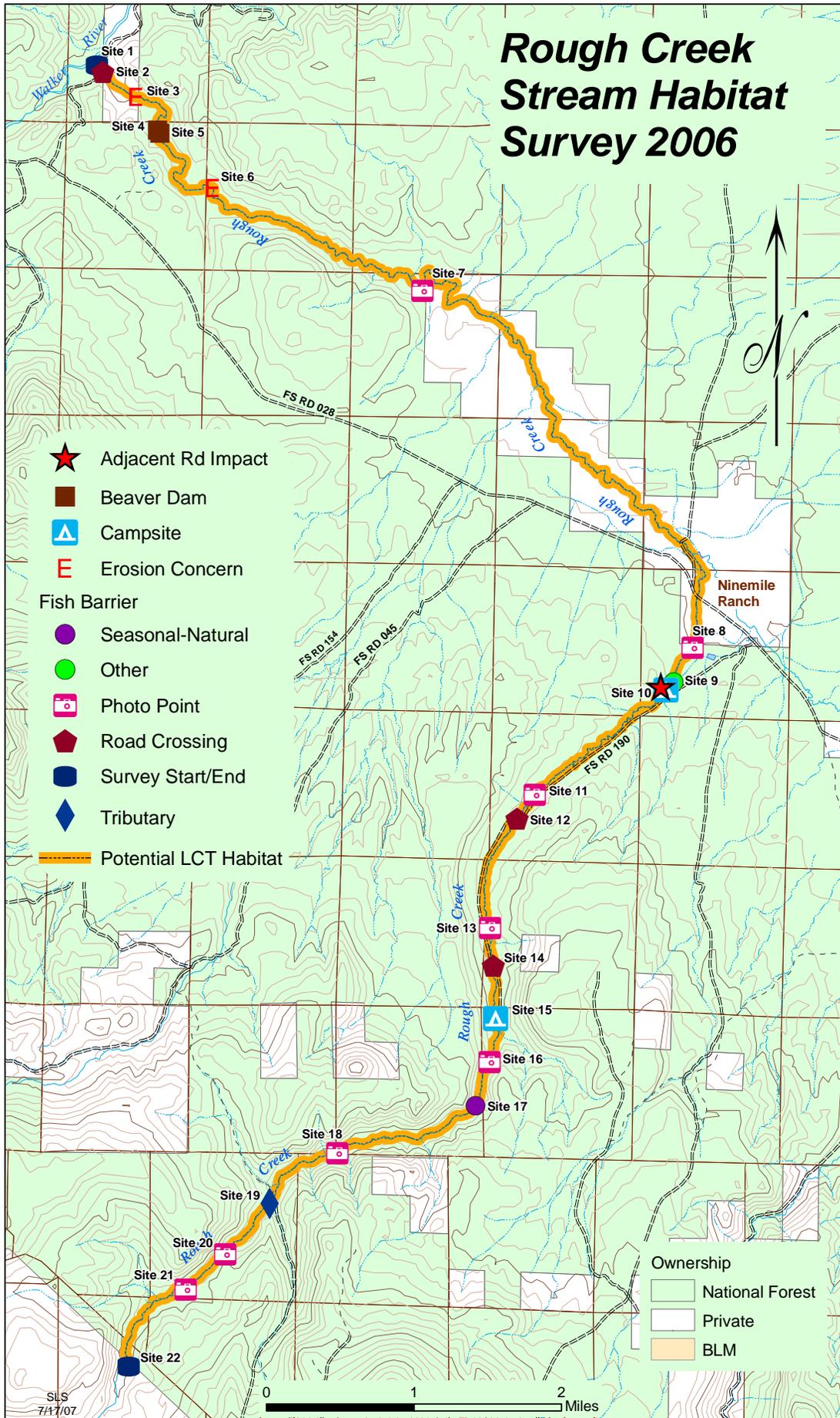
Map 2: Middle East Walker River

# East Walker River Stream Habitat Survey 2007 Map 3 of 3



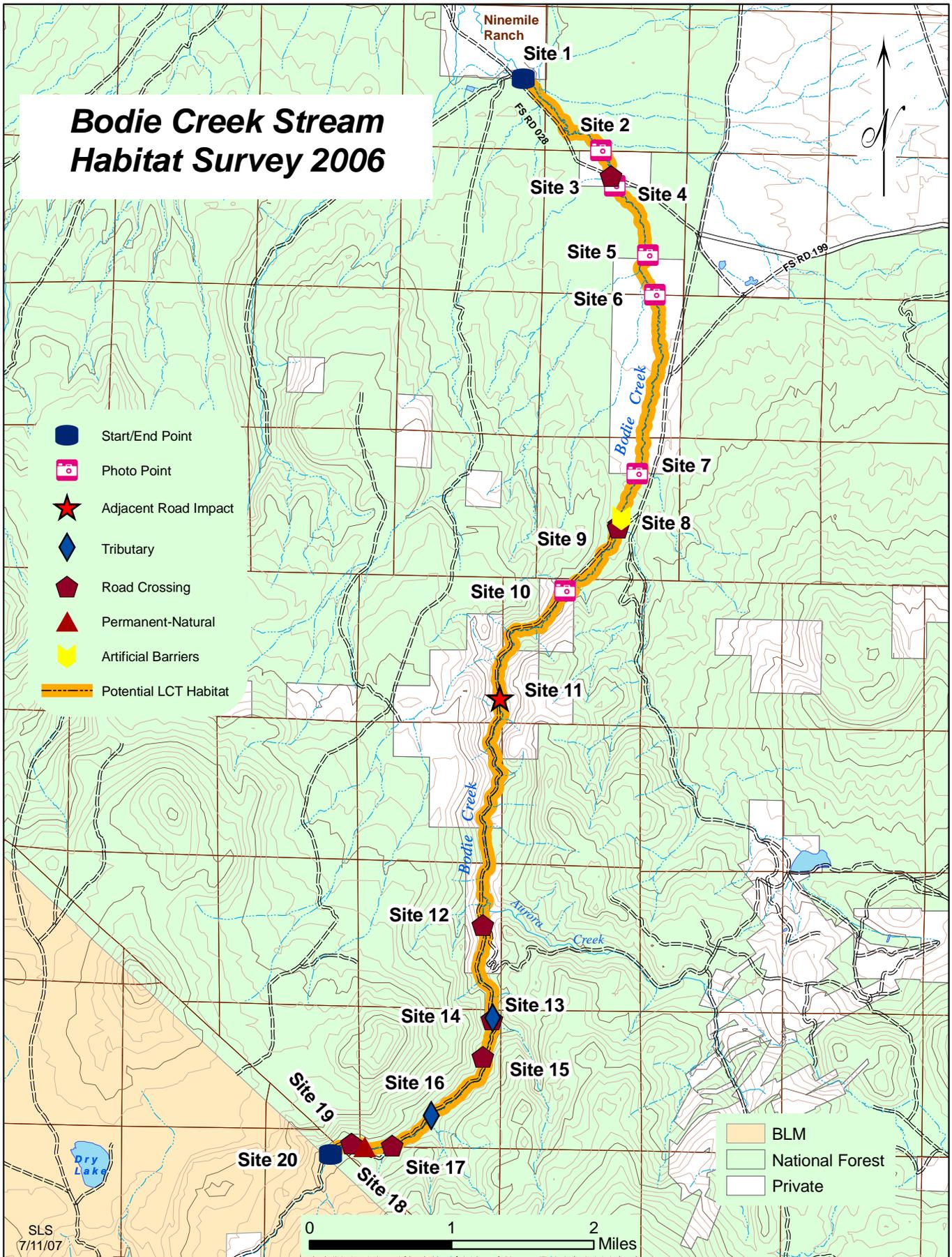
Map 3: Upper East Walker River

# Rough Creek Stream Habitat Survey 2006



Map 4: Overview of Rough Creek.

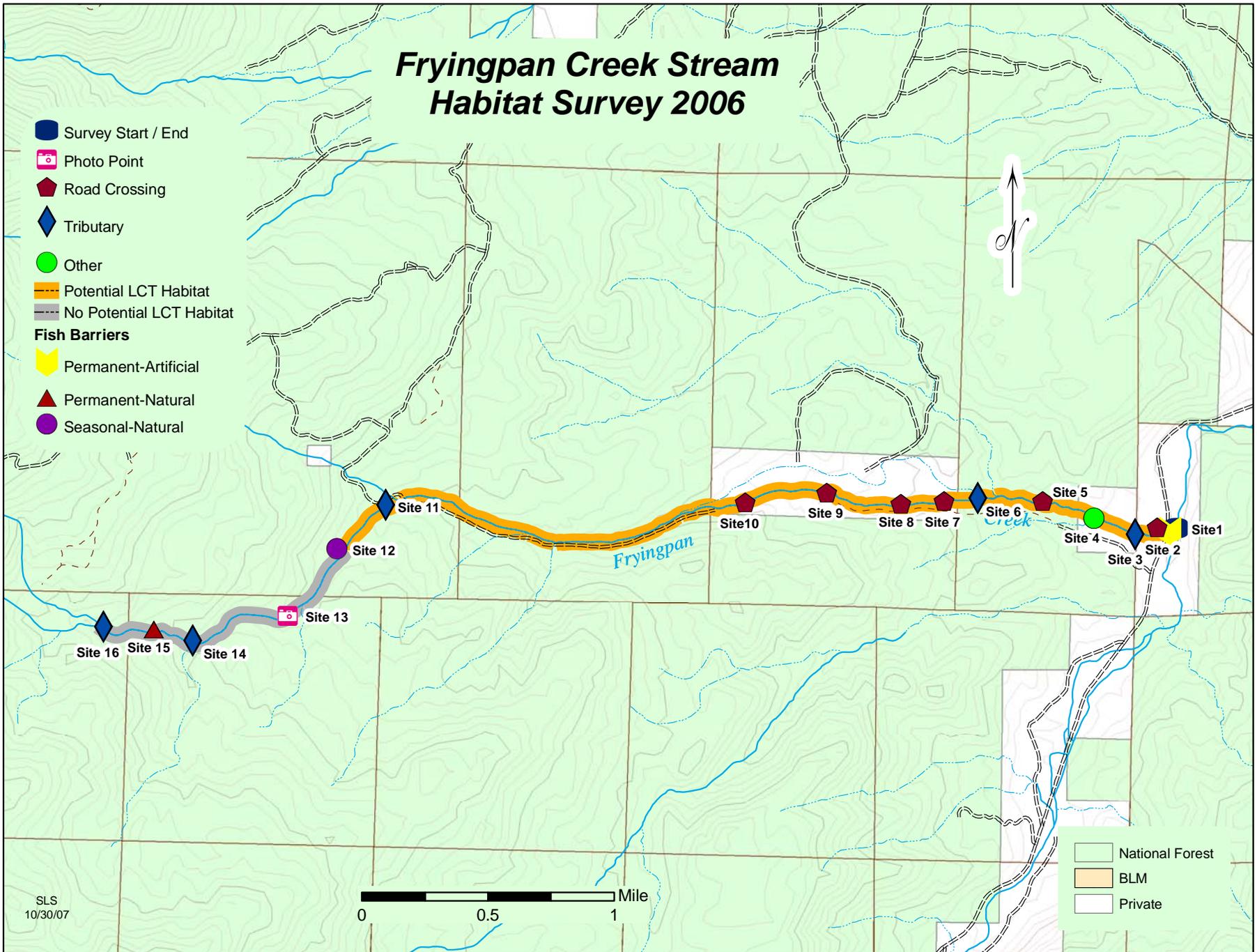
# Bodie Creek Stream Habitat Survey 2006



Map 5: Overview of Bodie Creek

# Fryingpan Creek Stream Habitat Survey 2006

-  Survey Start / End
  -  Photo Point
  -  Road Crossing
  -  Tributary
  -  Other
  -  Potential LCT Habitat
  -  No Potential LCT Habitat
- Fish Barriers**
-  Permanent-Artificial
  -  Permanent-Natural
  -  Seasonal-Natural



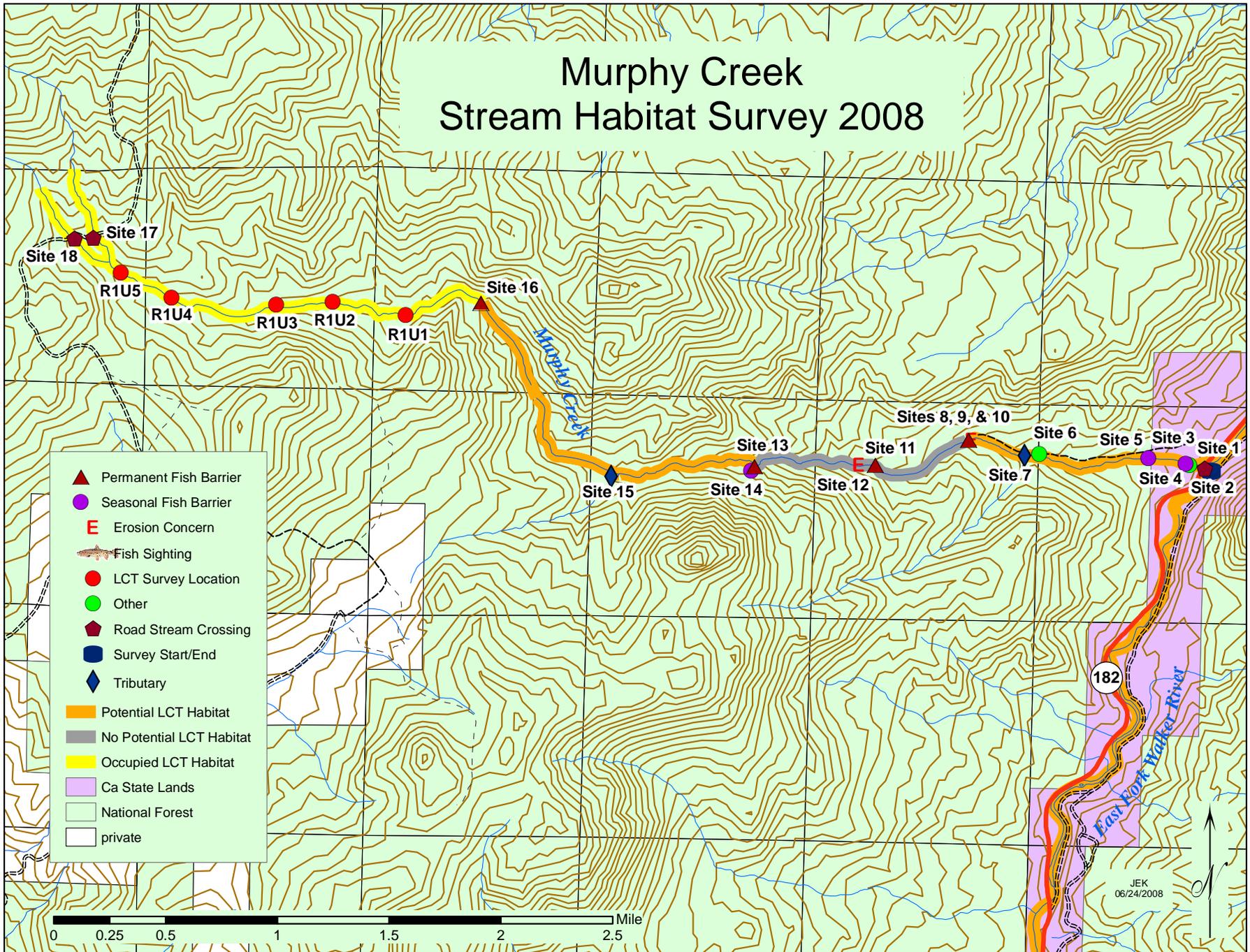
-  National Forest
-  BLM
-  Private

SLS  
10/30/07

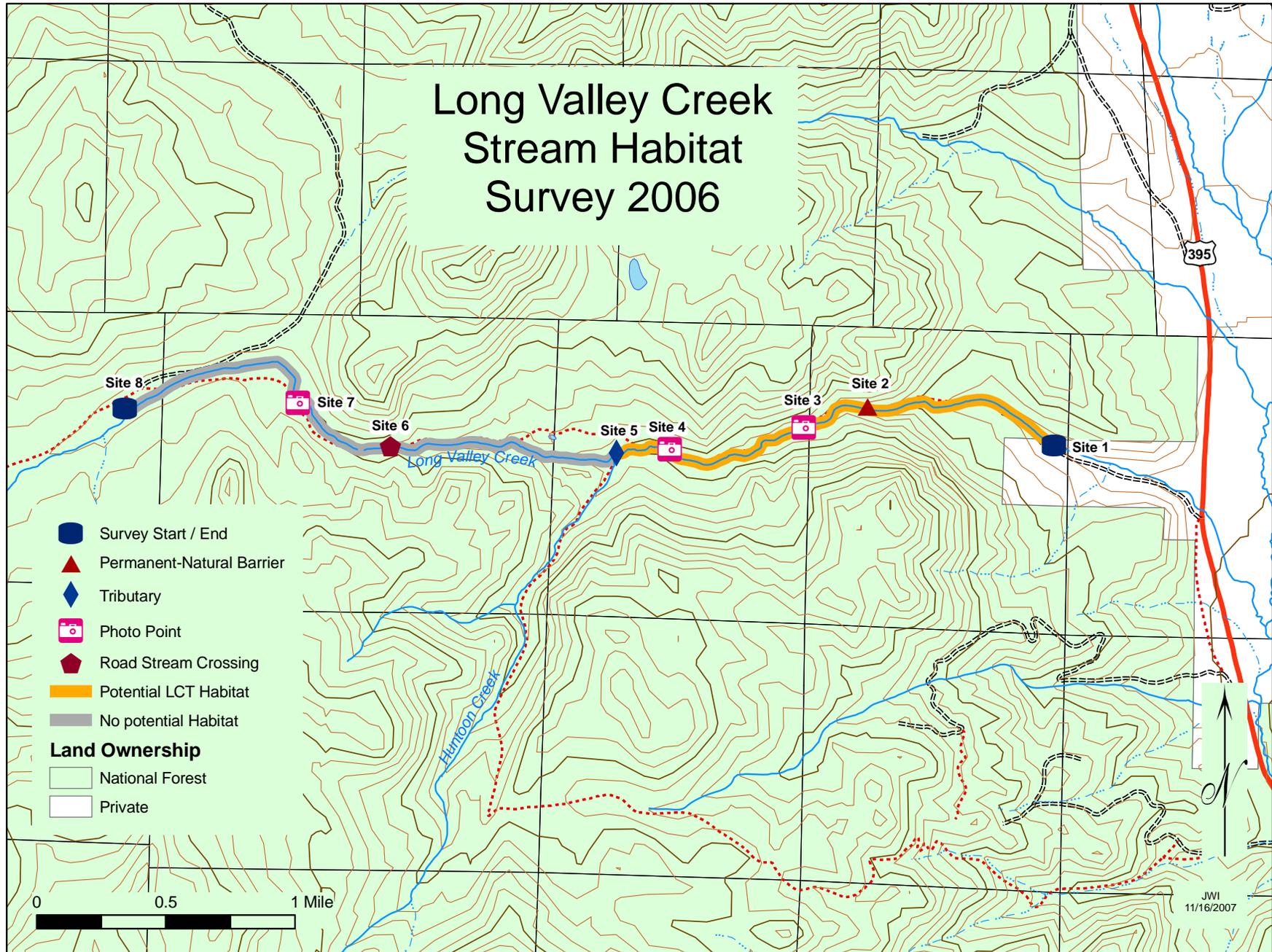
0 0.5 1 Mile

Map 6: Overview of Fryingpan Creek

# Murphy Creek Stream Habitat Survey 2008

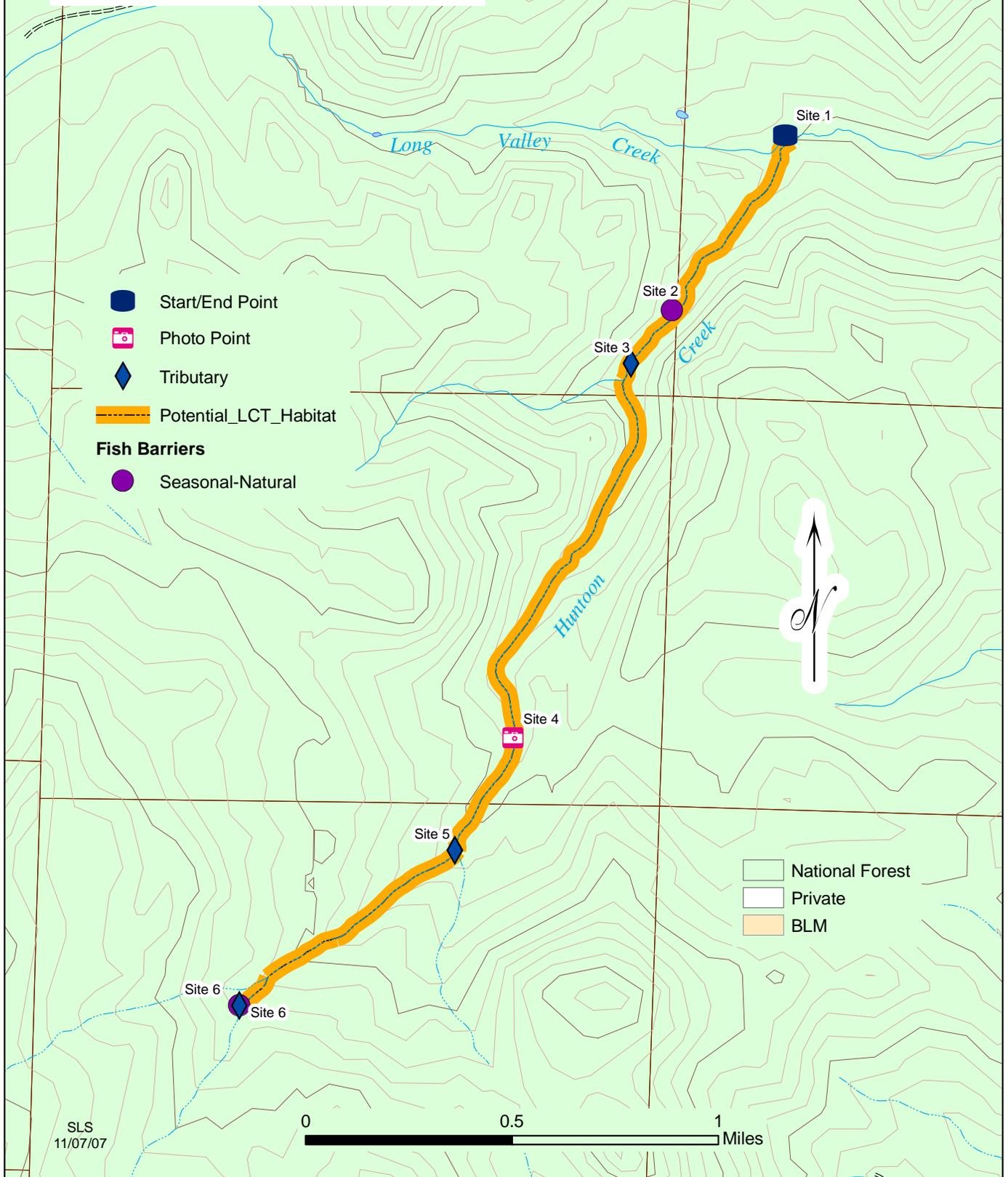


Map 7: Overview of Murphy Creek



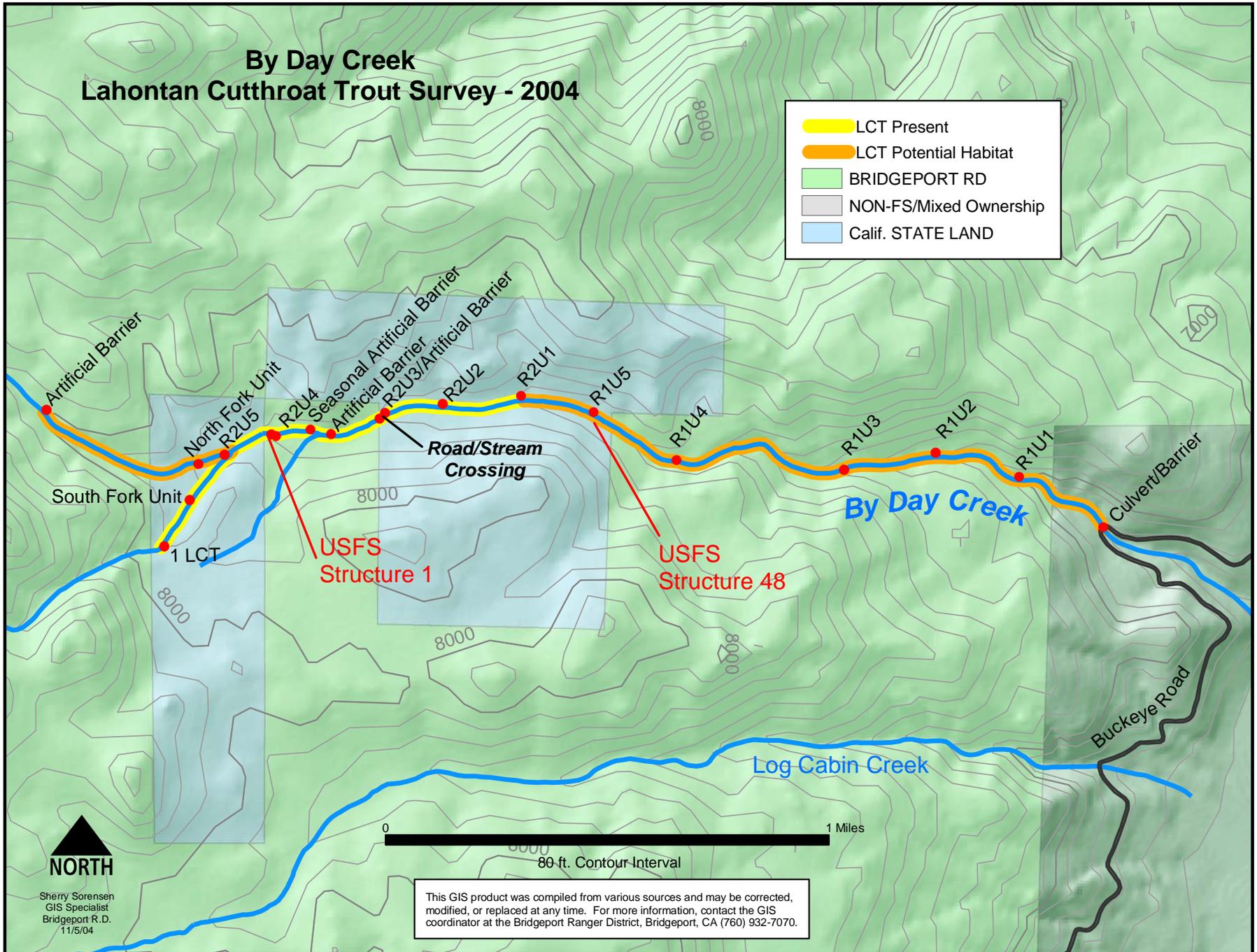
Map 8: Overview of Long Valley Creek

# Huntoon Creek Stream Habitat Survey 2006



Map 9: Overview of Huntoon Creek

# By Day Creek Lahontan Cutthroat Trout Survey - 2004

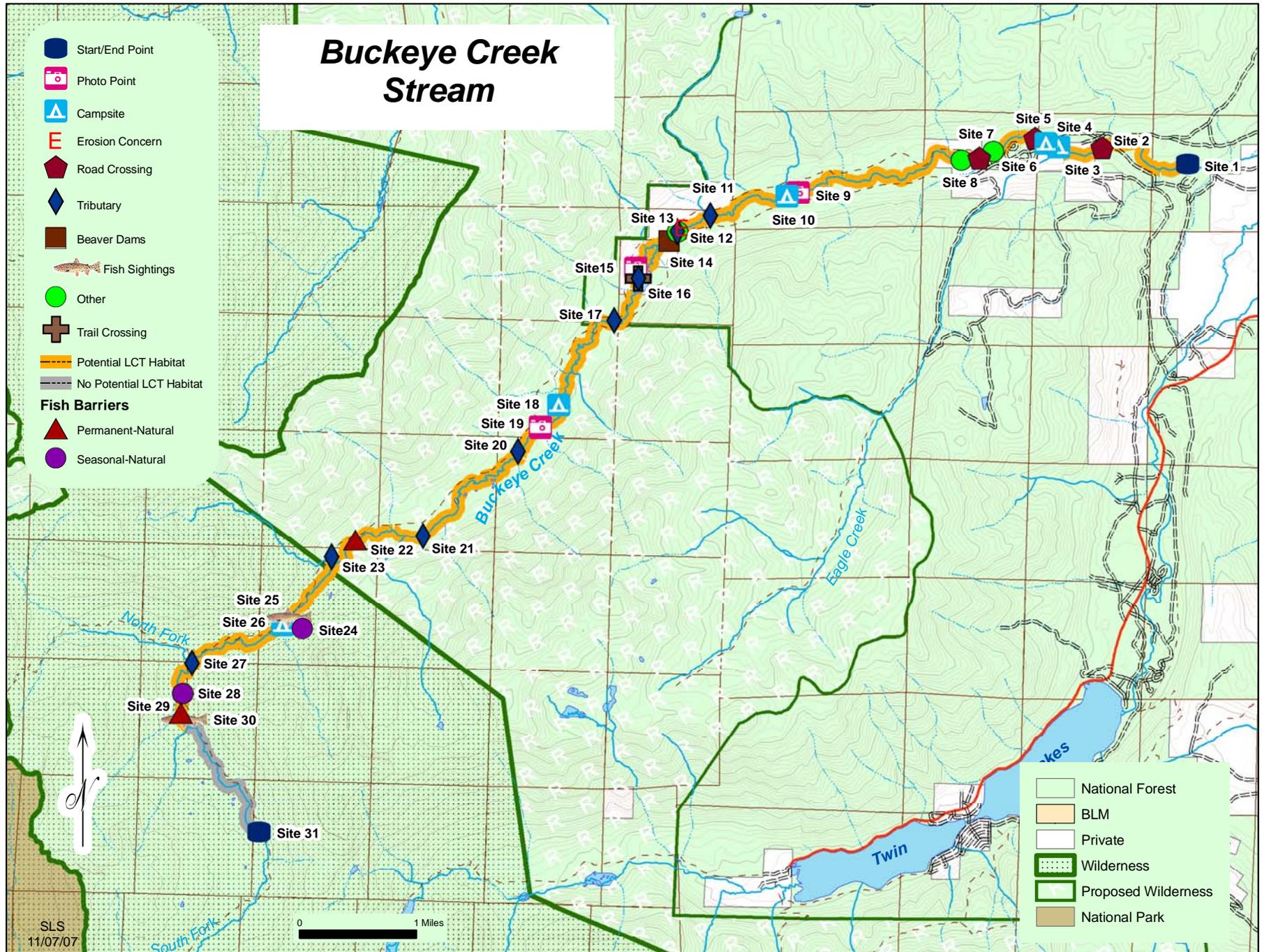


Sherry Sorensen  
GIS Specialist  
Bridgeport R.D.  
11/5/04

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Map 10: Overview of By-Day Creek.

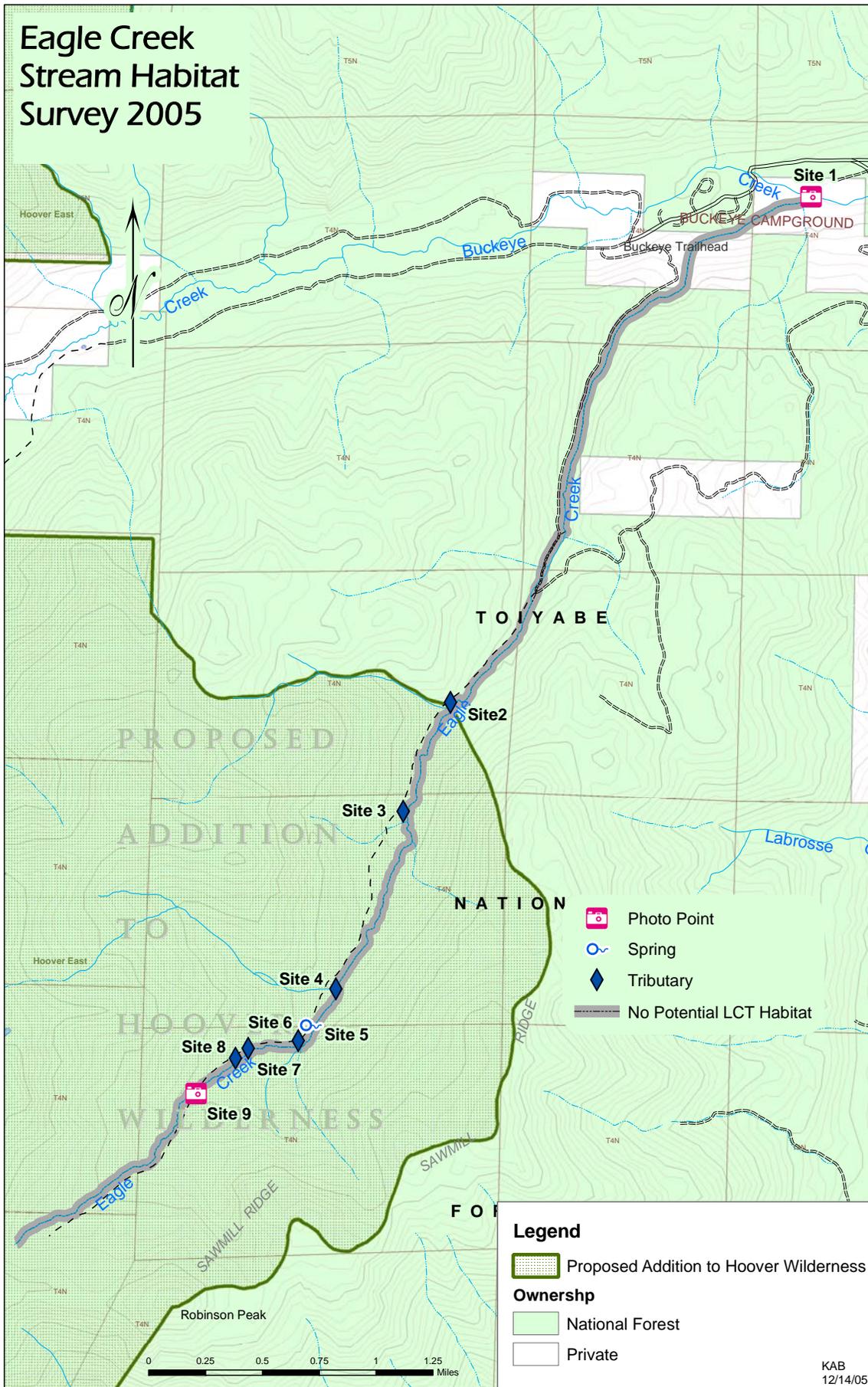
# Buckeye Creek Stream



SLS  
11/07/07

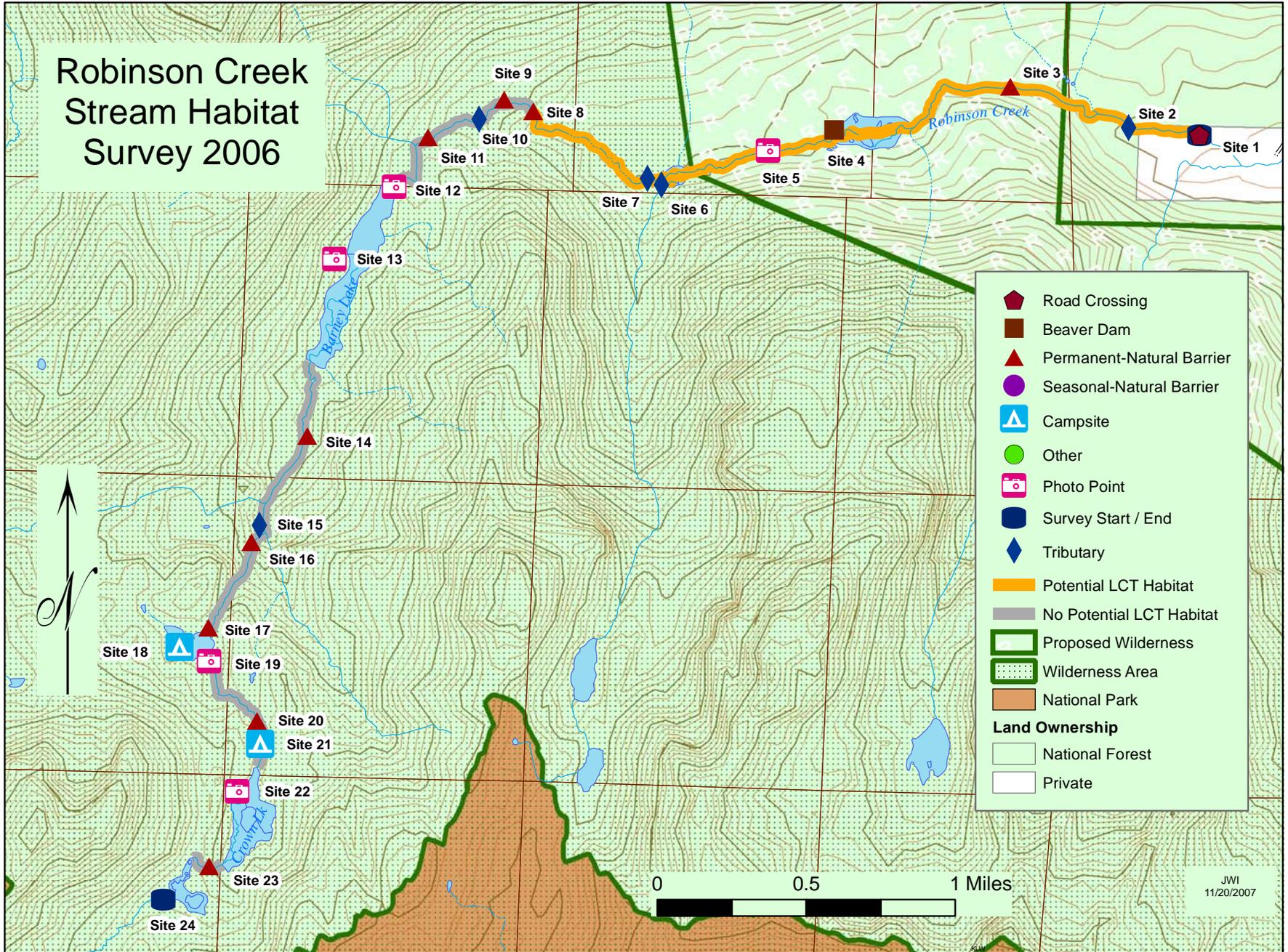
Map 11: Overview of Buckeye Creek

# Eagle Creek Stream Habitat Survey 2005

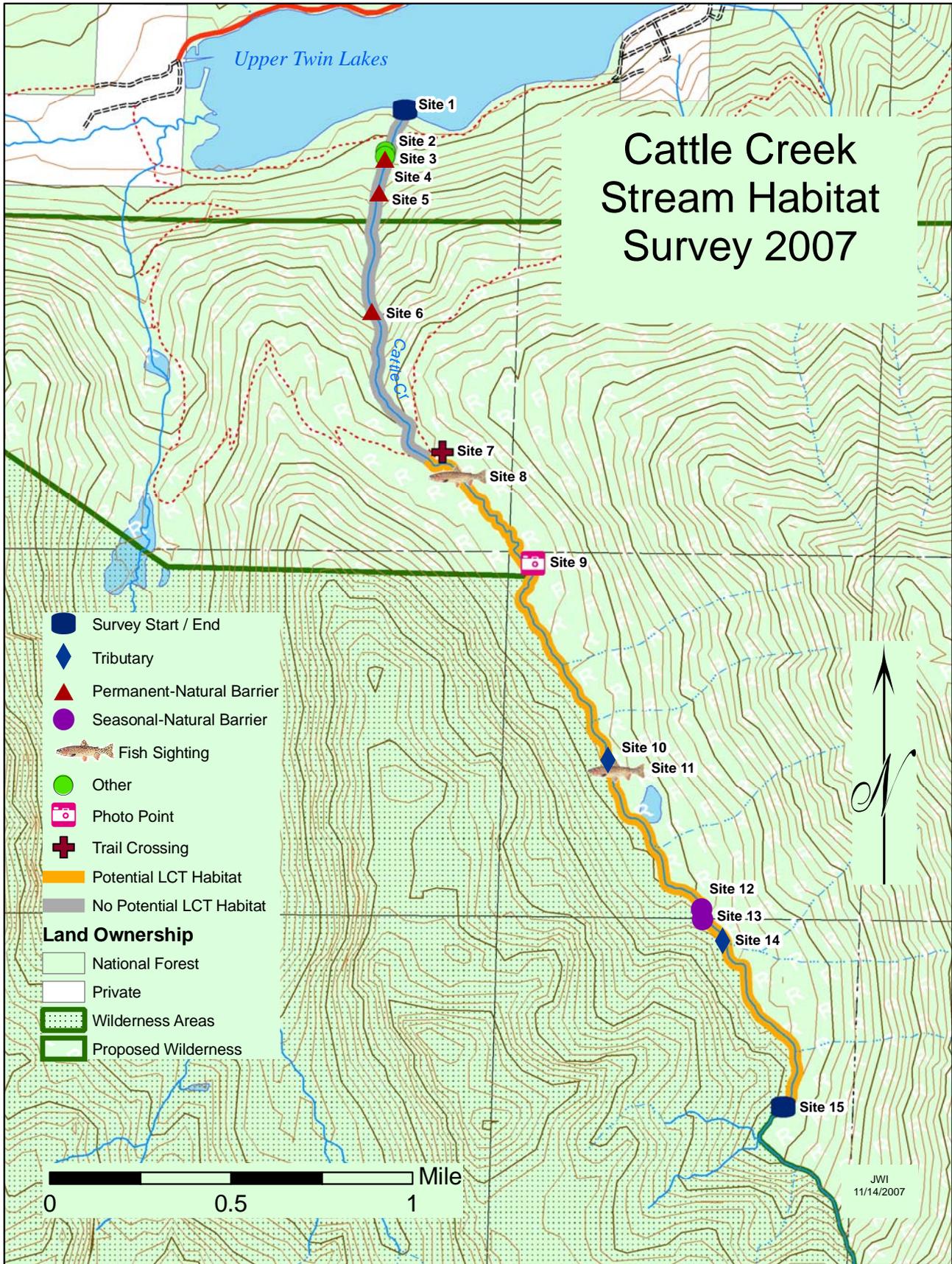


Map 12: Overview of Eagle Creek

# Robinson Creek Stream Habitat Survey 2006

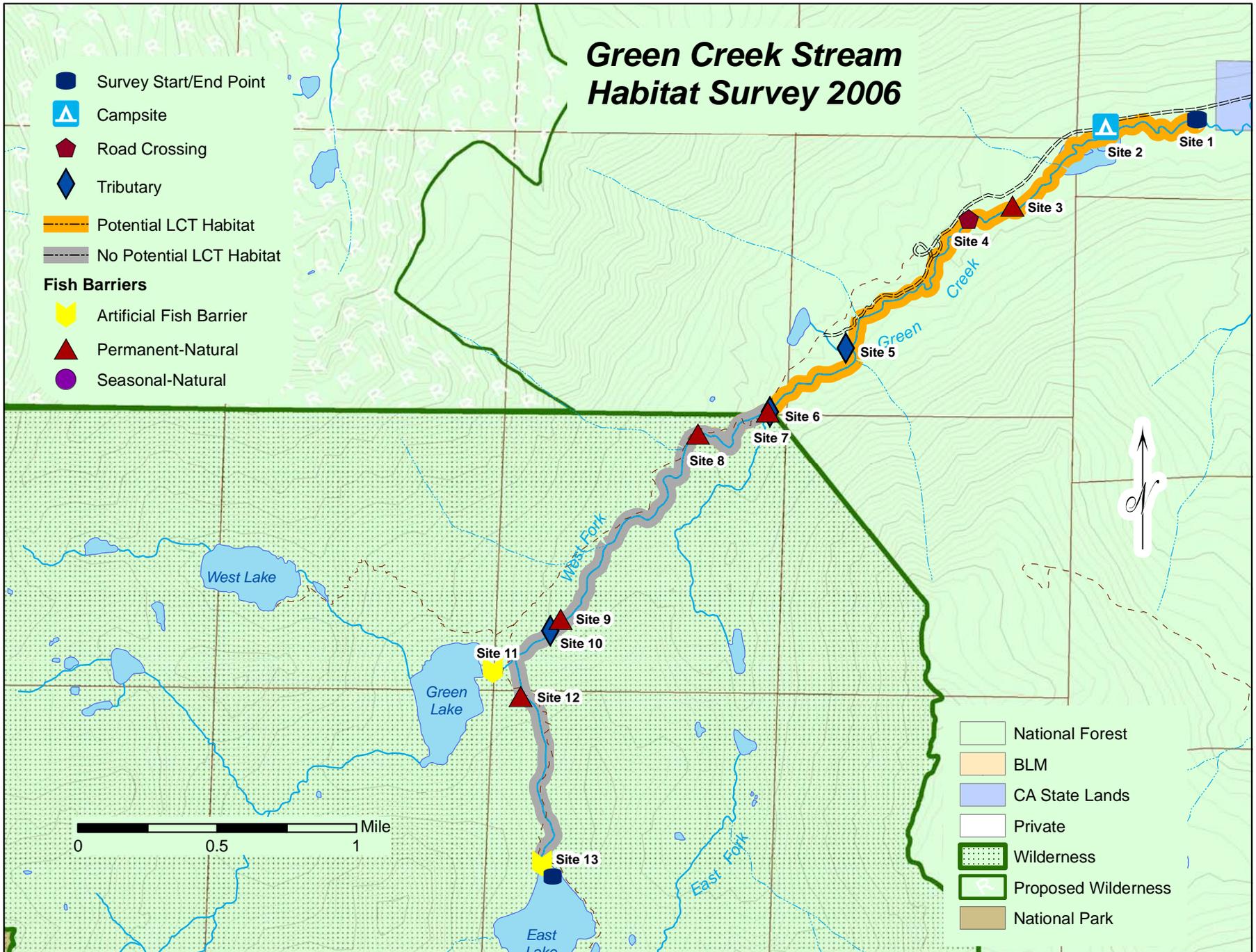


Map 13: Overview of Robinson Creek



Map 14: Overview of Cattle Creek

# Green Creek Stream Habitat Survey 2006

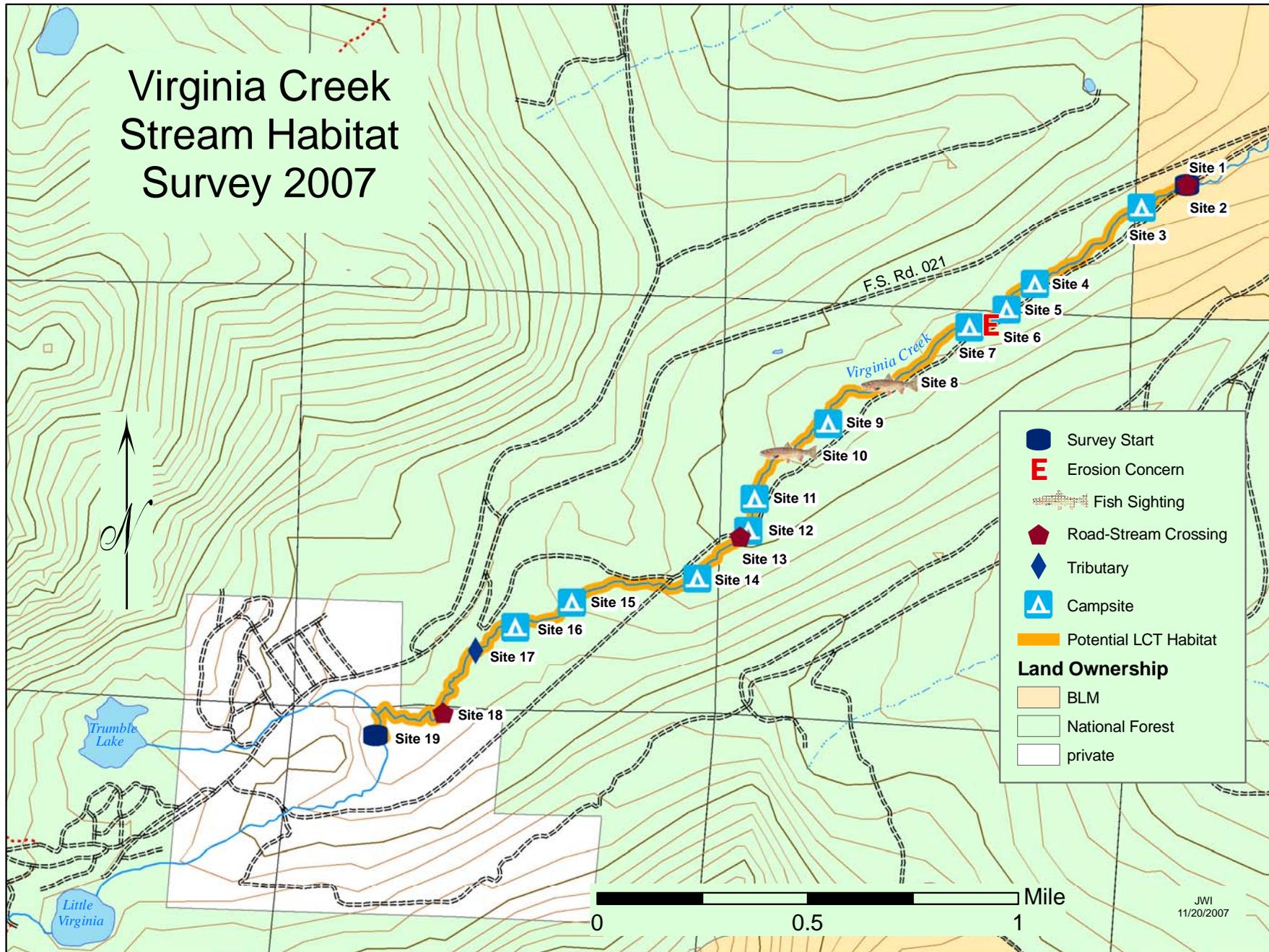


- Survey Start/End Point
- ▲ Campsite
- ◆ Road Crossing
- ◆ Tributary
- Potential LCT Habitat
- No Potential LCT Habitat
- Fish Barriers**
- ▾ Artificial Fish Barrier
- ▲ Permanent-Natural
- Seasonal-Natural

- National Forest
- BLM
- CA State Lands
- Private
- Wilderness
- Proposed Wilderness
- National Park

Map 15: Overview of Green Creek

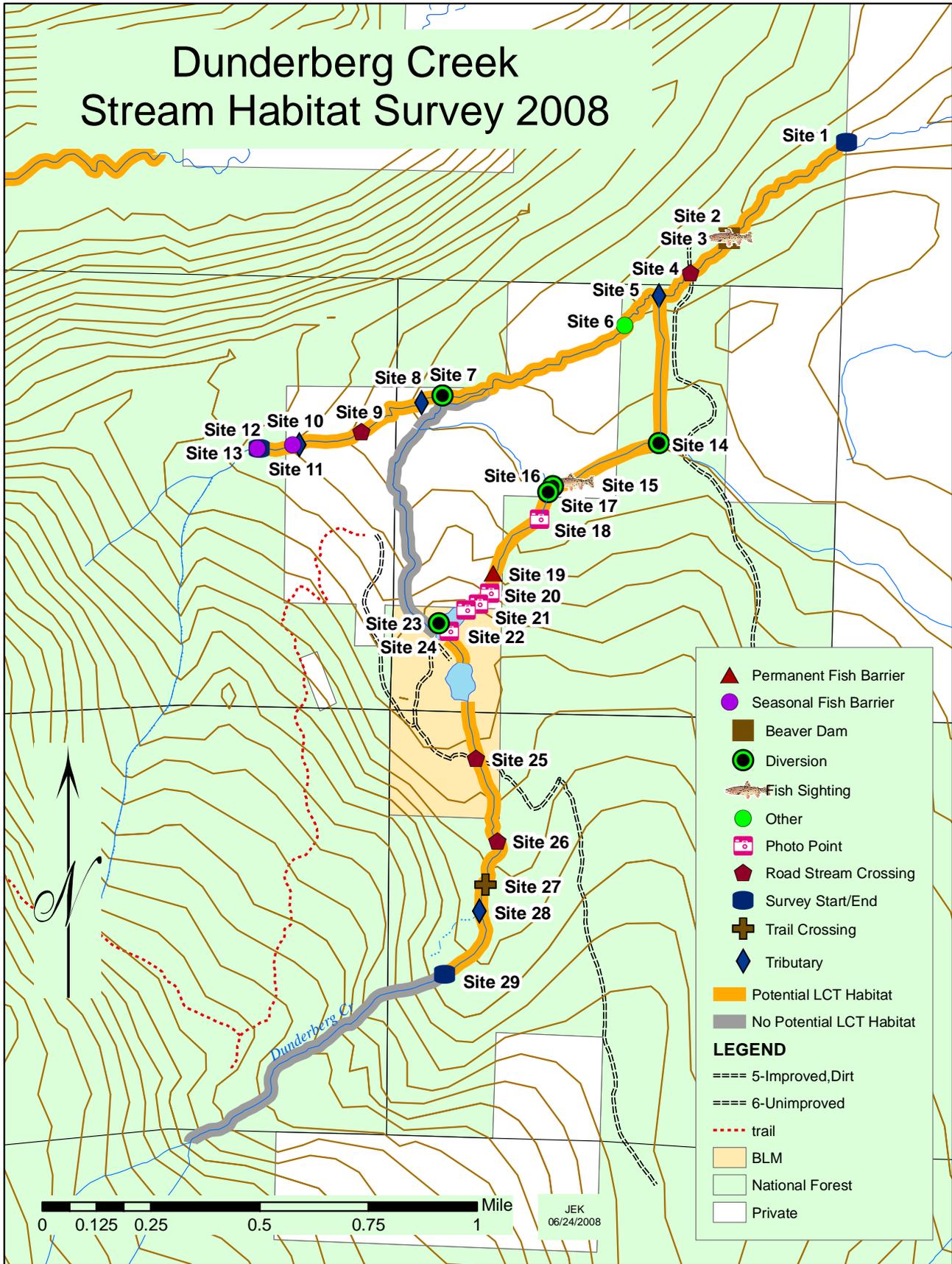
# Virginia Creek Stream Habitat Survey 2007



JWI  
11/20/2007

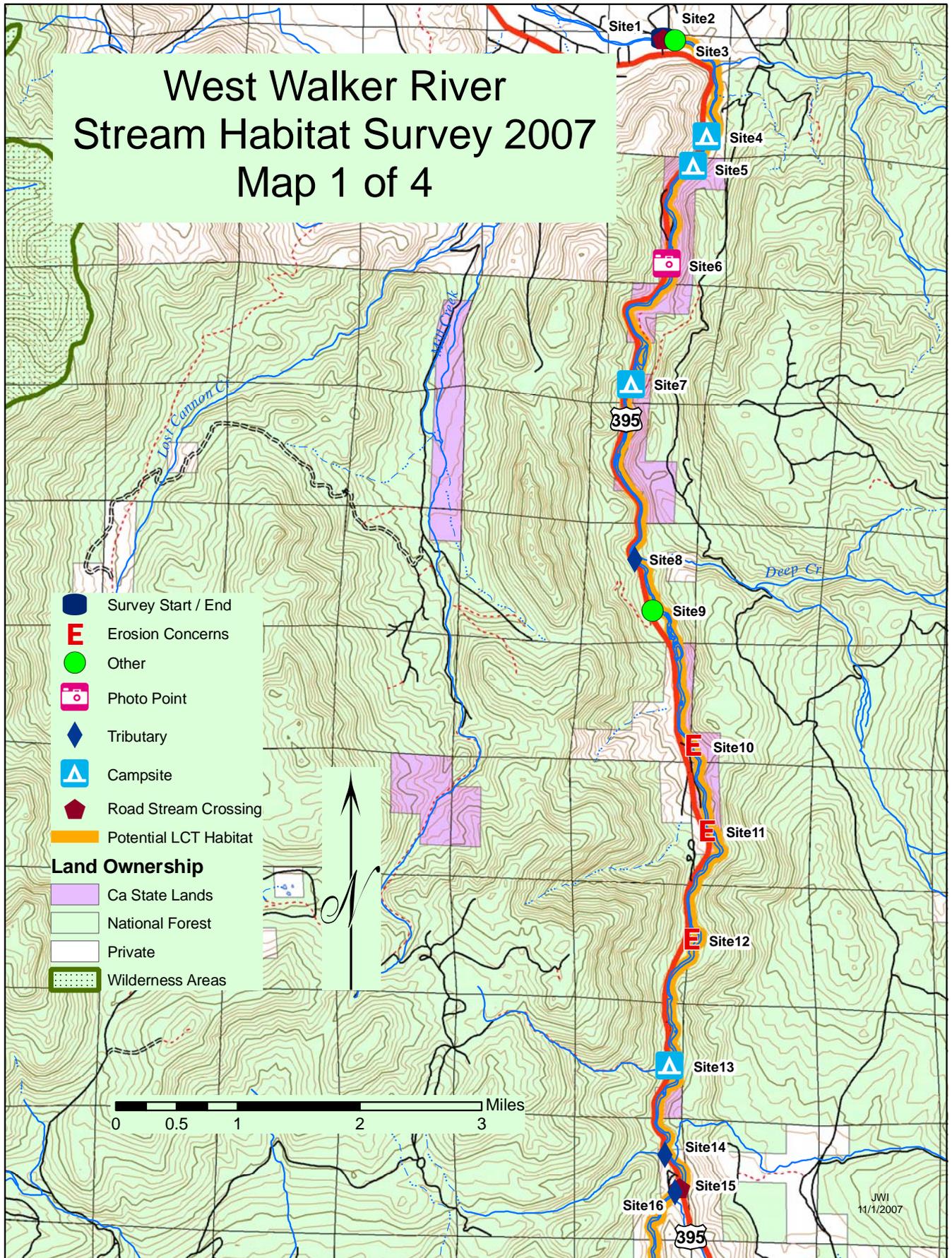
Map 16: Overview of Virginia Creek

# Dunderberg Creek Stream Habitat Survey 2008



Map 17: Overview of Dunderberg Creek

# West Walker River Stream Habitat Survey 2007 Map 1 of 4



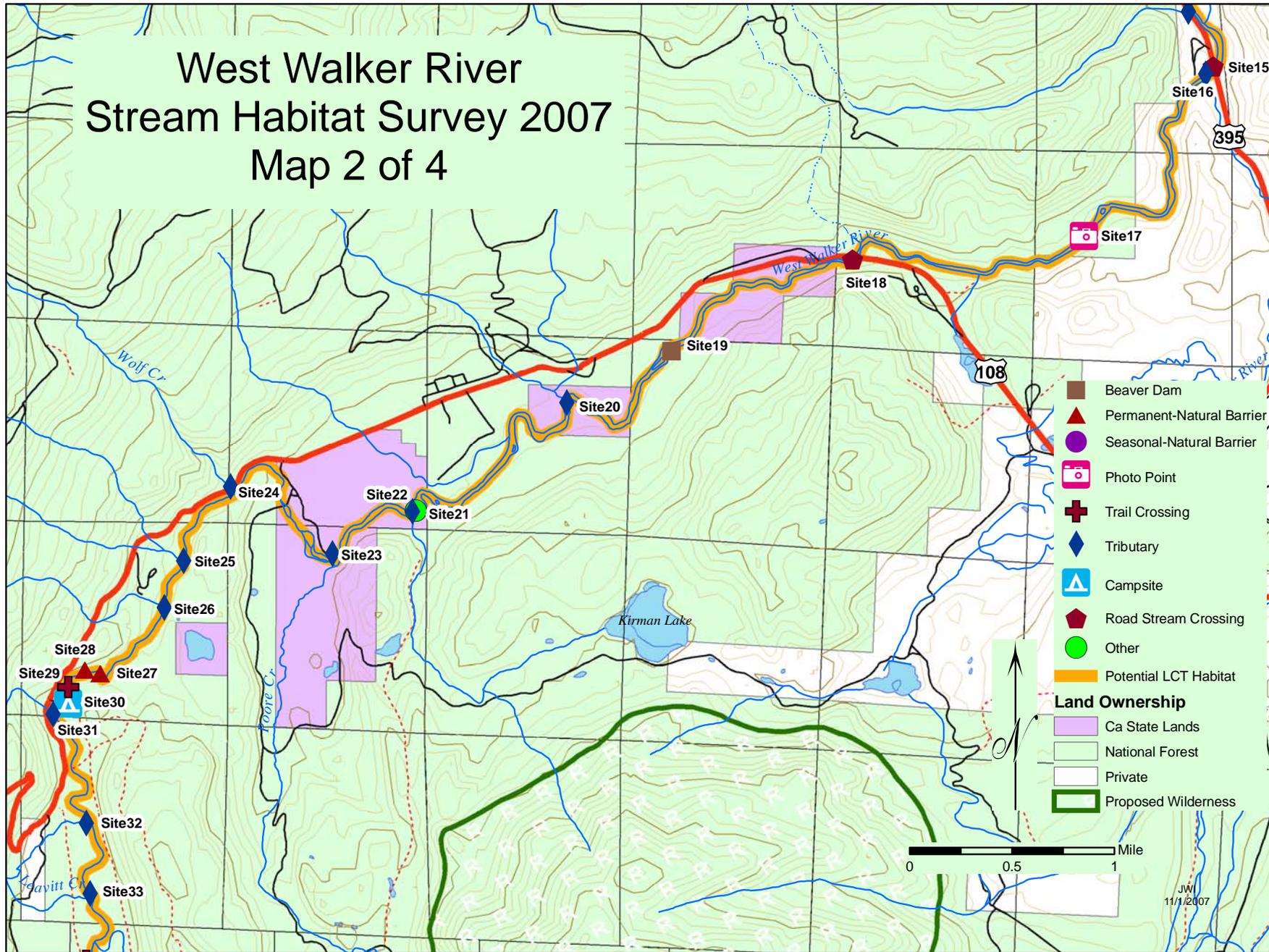
-  Survey Start / End
  -  Erosion Concerns
  -  Other
  -  Photo Point
  -  Tributary
  -  Campsite
  -  Road Stream Crossing
  -  Potential LCT Habitat
- Land Ownership**
-  Ca State Lands
  -  National Forest
  -  Private
  -  Wilderness Areas

0 0.5 1 2 3 Miles

JWI  
11/1/2007

Map 18: Lower West Walker River

# West Walker River Stream Habitat Survey 2007 Map 2 of 4

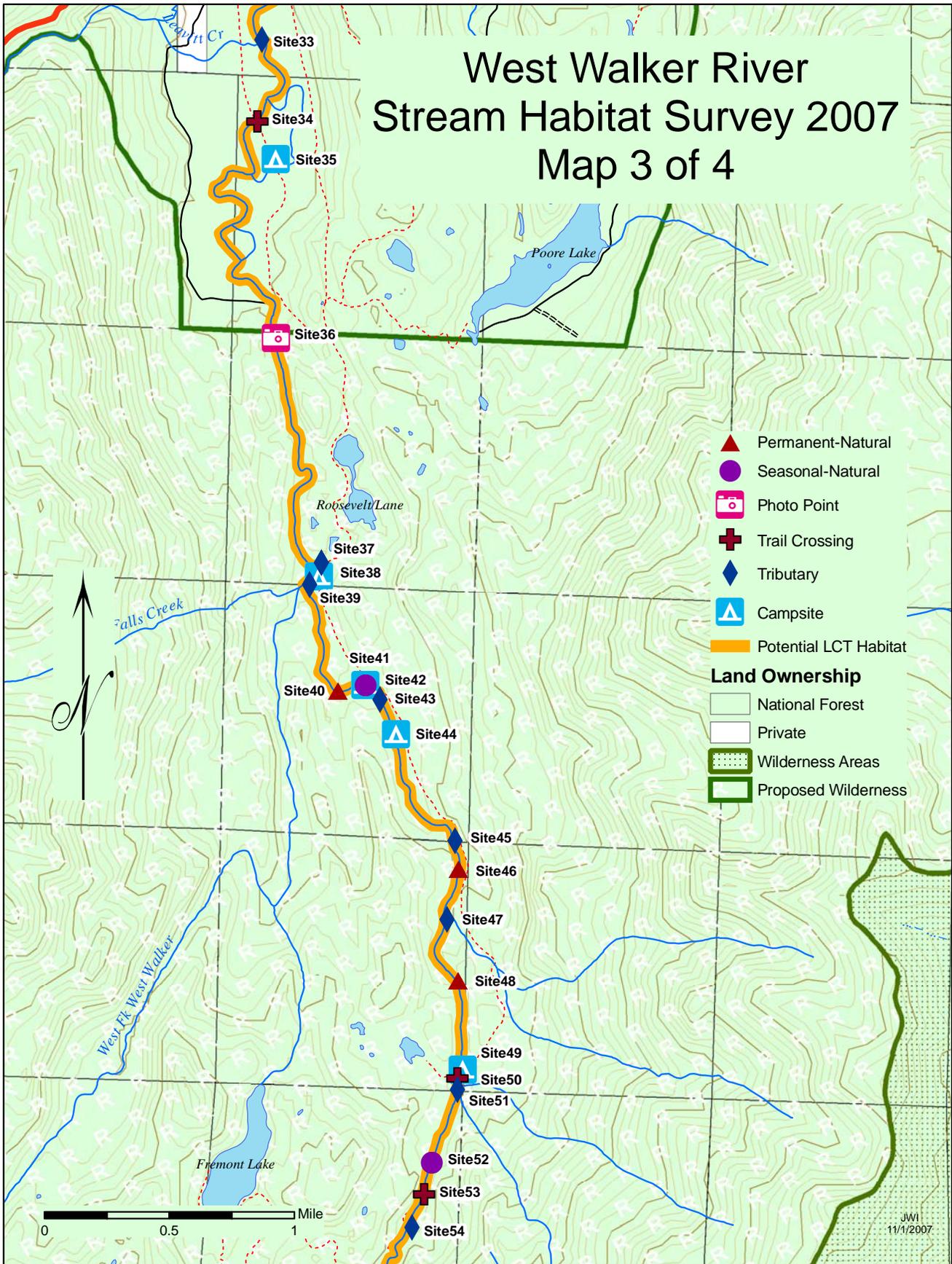


- Beaver Dam
  - ▲ Permanent-Natural Barrier
  - Seasonal-Natural Barrier
  - Photo Point
  - ✚ Trail Crossing
  - ◆ Tributary
  - ▲ Campsite
  - ⬠ Road Stream Crossing
  - Other
  - ▬ Potential LCT Habitat
- Land Ownership**
- Ca State Lands
  - National Forest
  - Private
  - ▭ Proposed Wilderness

JW  
11/1/2007

Map 19: Lower-Middle West Walker River

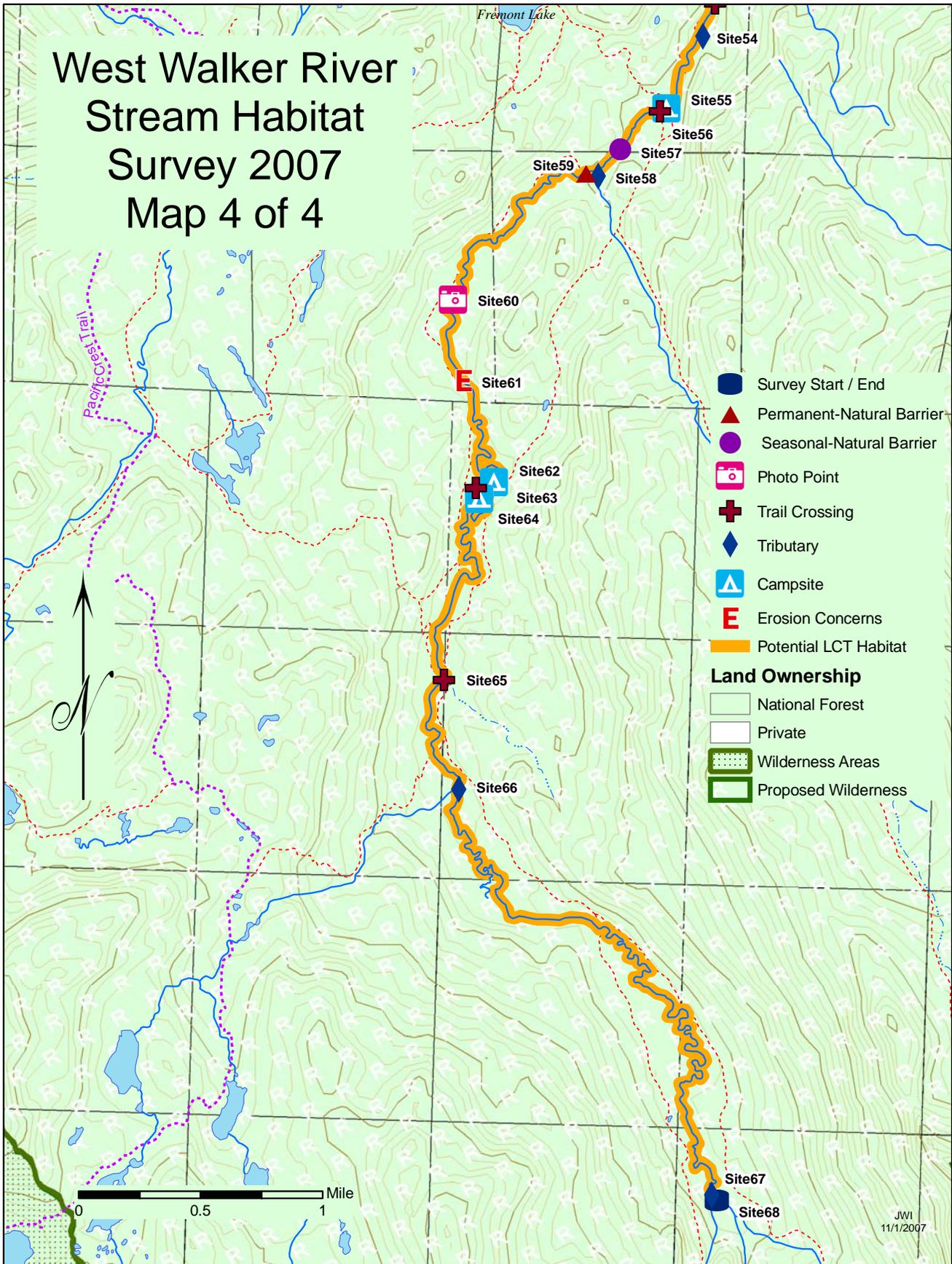
# West Walker River Stream Habitat Survey 2007 Map 3 of 4



Map 20: Upper-Middle West Walker River

JW1  
11/1/2007

# West Walker River Stream Habitat Survey 2007 Map 4 of 4

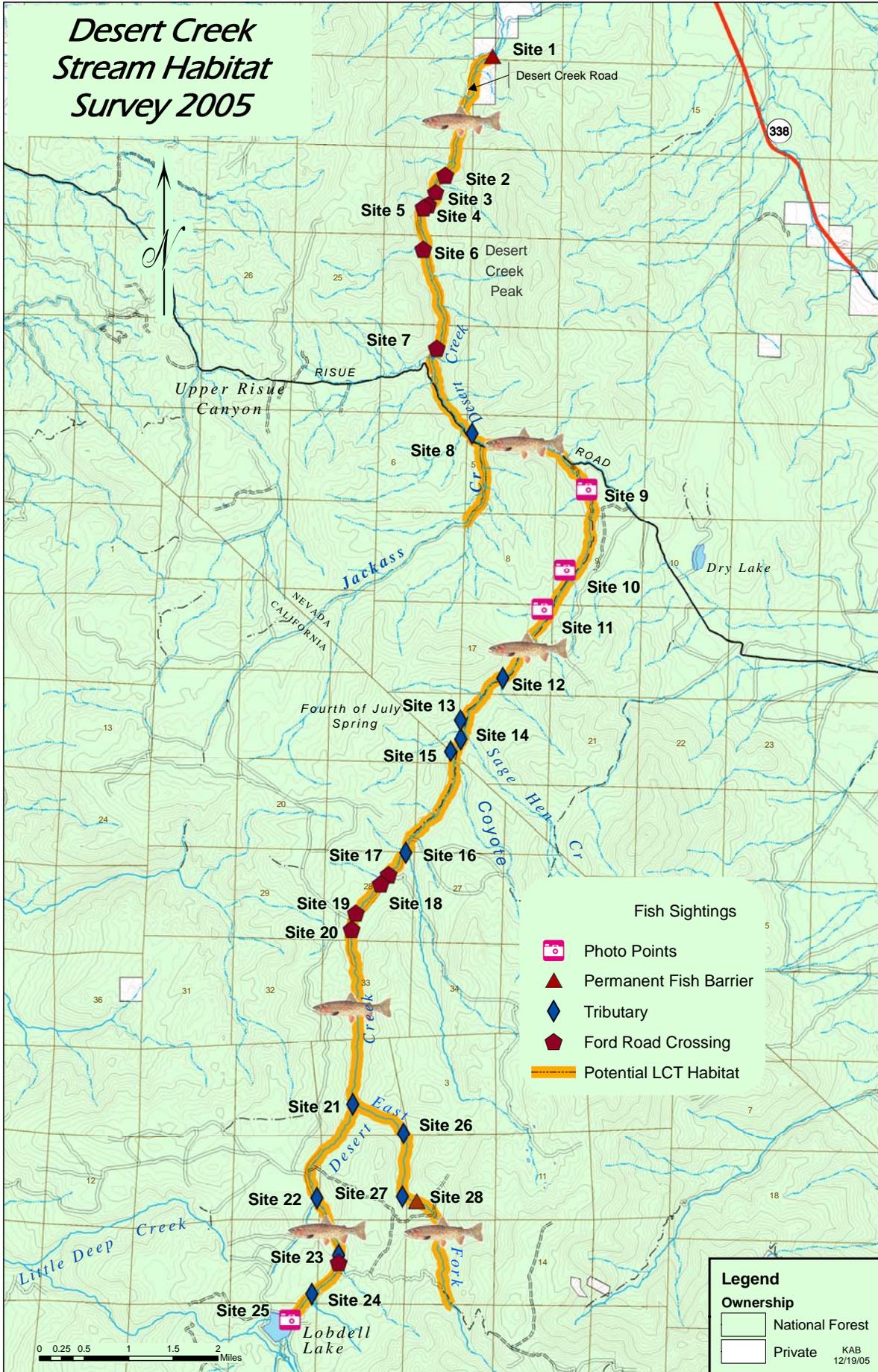


- ◆ Survey Start / End
  - ▲ Permanent-Natural Barrier
  - Seasonal-Natural Barrier
  - 📷 Photo Point
  - + Trail Crossing
  - ◆ Tributary
  - ▲ Campsite
  - E Erosion Concerns
  - Potential LCT Habitat
- Land Ownership**
- National Forest
  - Private
  - Wilderness Areas
  - Proposed Wilderness

JWI  
11/1/2007

Map 21: Upper West Walker River

# Desert Creek Stream Habitat Survey 2005



- Fish Sightings**
- Photo Points
  - Permanent Fish Barrier
  - Tributary
  - Ford Road Crossing
  - Potential LCT Habitat

**Legend**

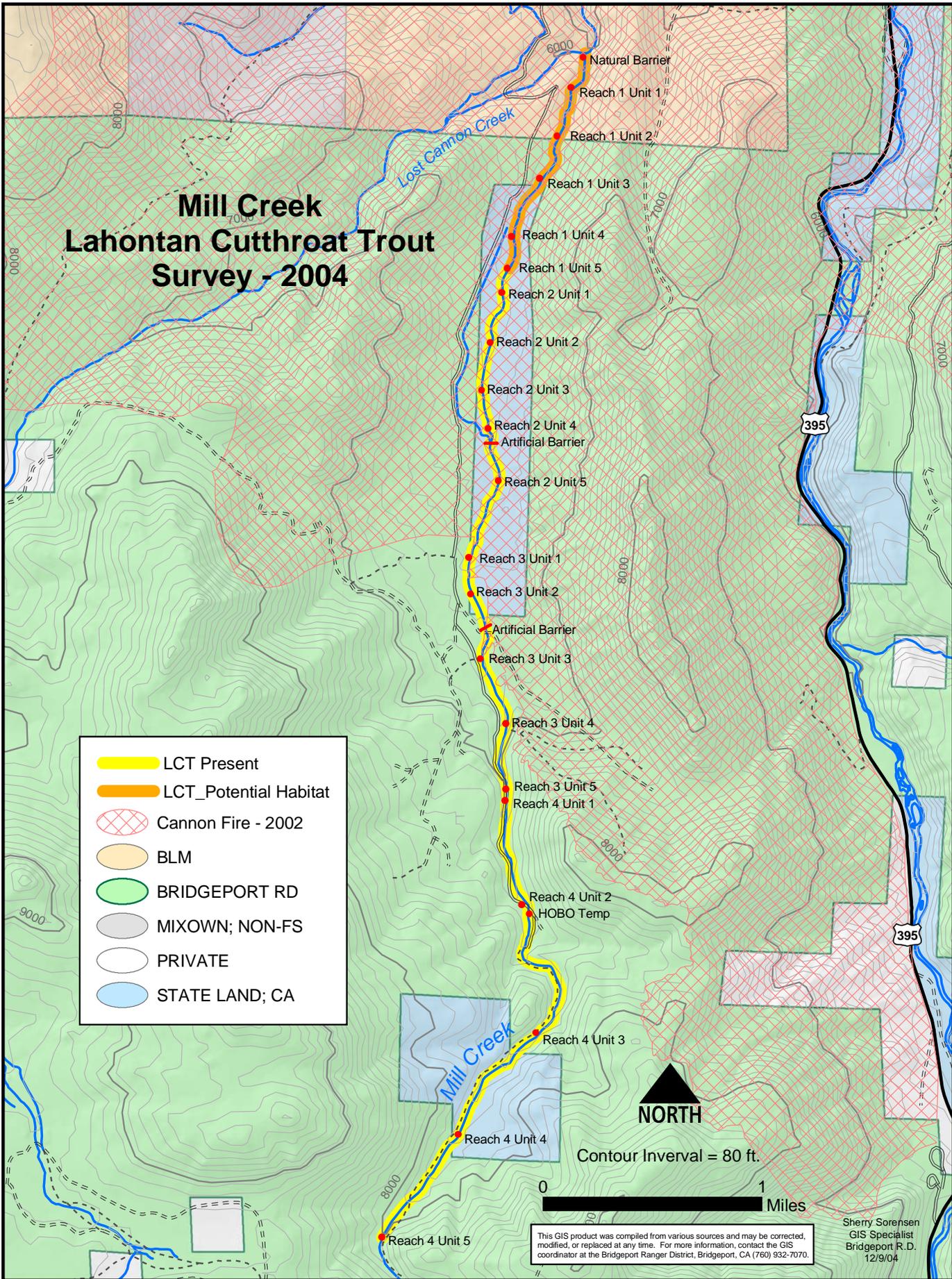
**Ownership**

- National Forest
- Private

KAB  
12/19/05

Map 22: Overview of Desert Creek

# Mill Creek Lahontan Cutthroat Trout Survey - 2004



- LCT Present
- LCT\_Potential Habitat
- Cannon Fire - 2002
- BLM
- BRIDGEPORT RD
- MIXOWN; NON-FS
- PRIVATE
- STATE LAND; CA

**NORTH**

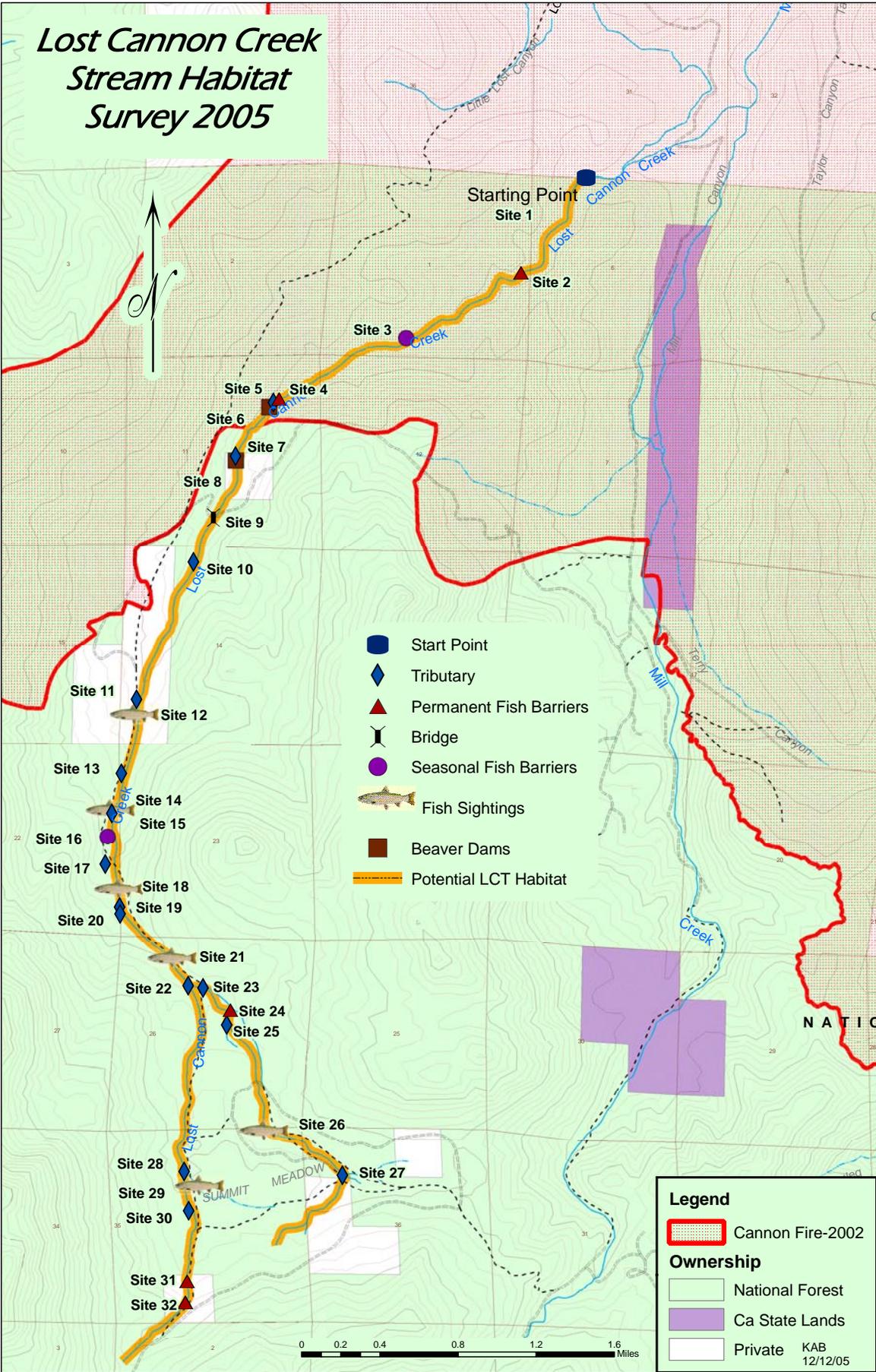
Contour Interval = 80 ft.

0 1  
Miles

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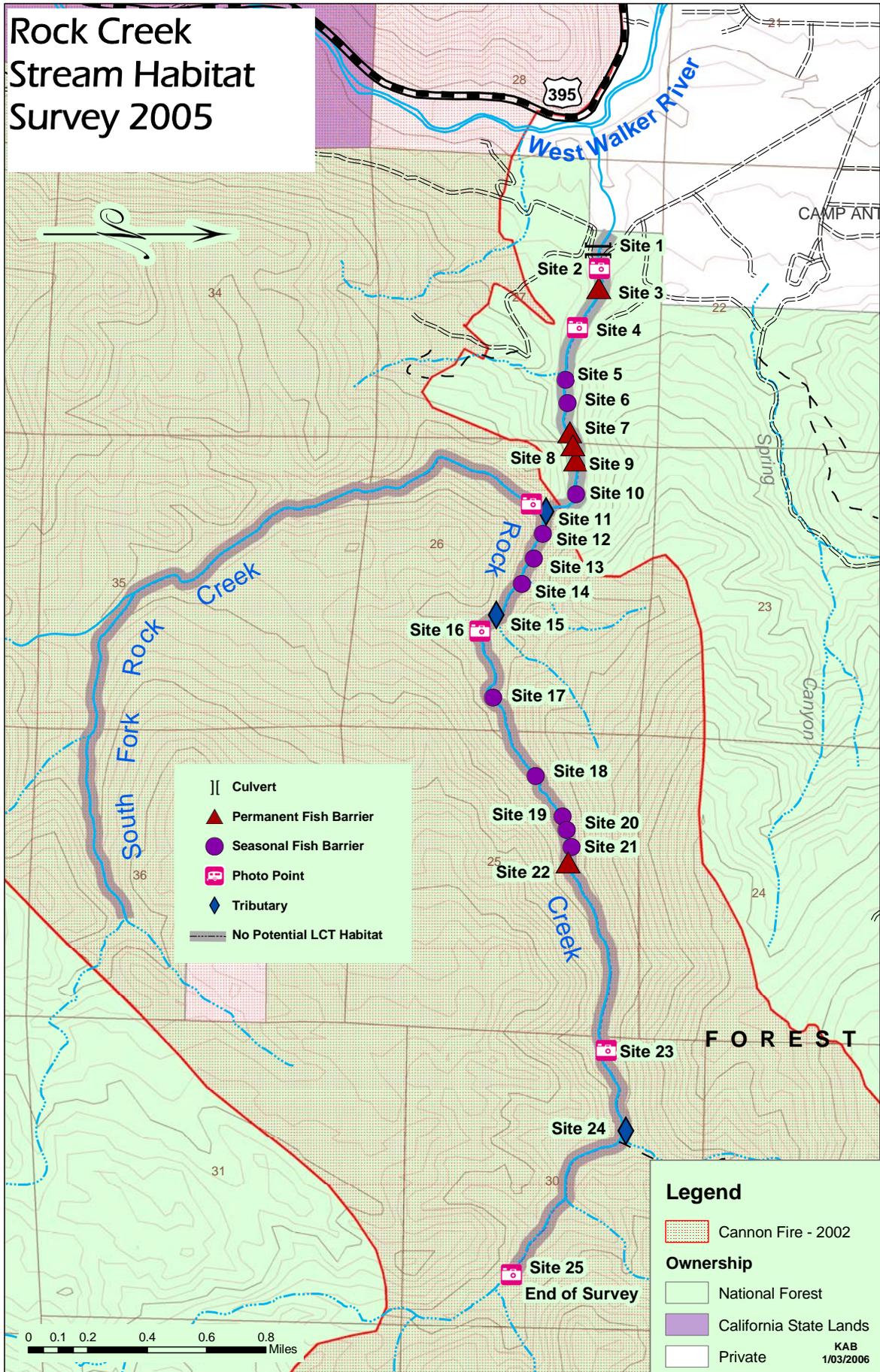
Sherry Sorensen  
GIS Specialist  
Bridgeport R.D.  
12/9/04

Map 23: Overview of Mill Creek



Map 24: Overview of Lost Cannon Creek

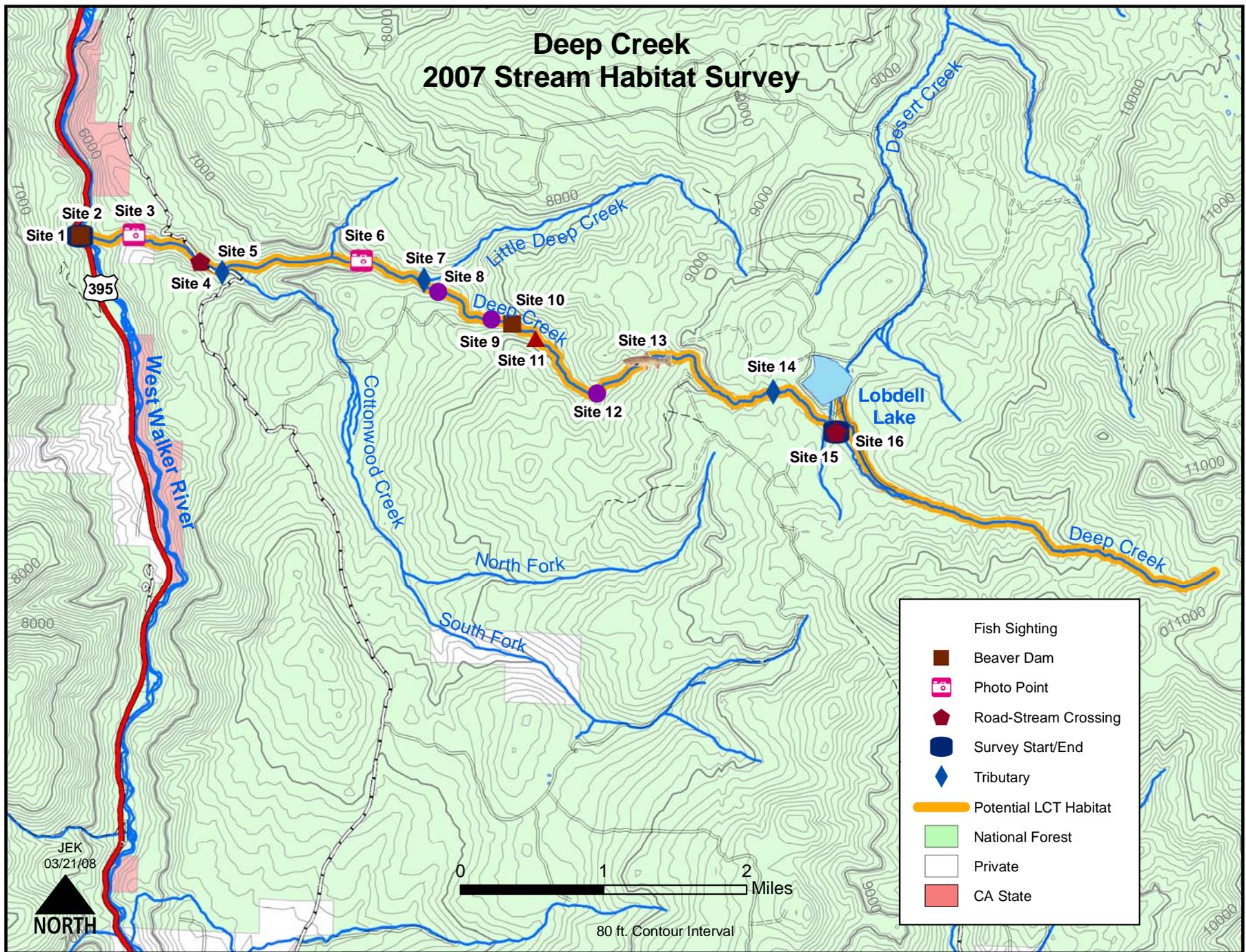
# Rock Creek Stream Habitat Survey 2005



Map 25: Overview of Rock Creek

KAB  
1/03/2006

# Deep Creek 2007 Stream Habitat Survey



- Fish Sighting
- Beaver Dam
- Photo Point
- Road-Stream Crossing
- Survey Start/End
- Tributary
- Potential LCT Habitat
- National Forest
- Private
- CA State

JEK  
03/21/08  
NORTH

0 1 2 Miles  
80 ft. Contour Interval

Map 26: Overview of Deep Creek

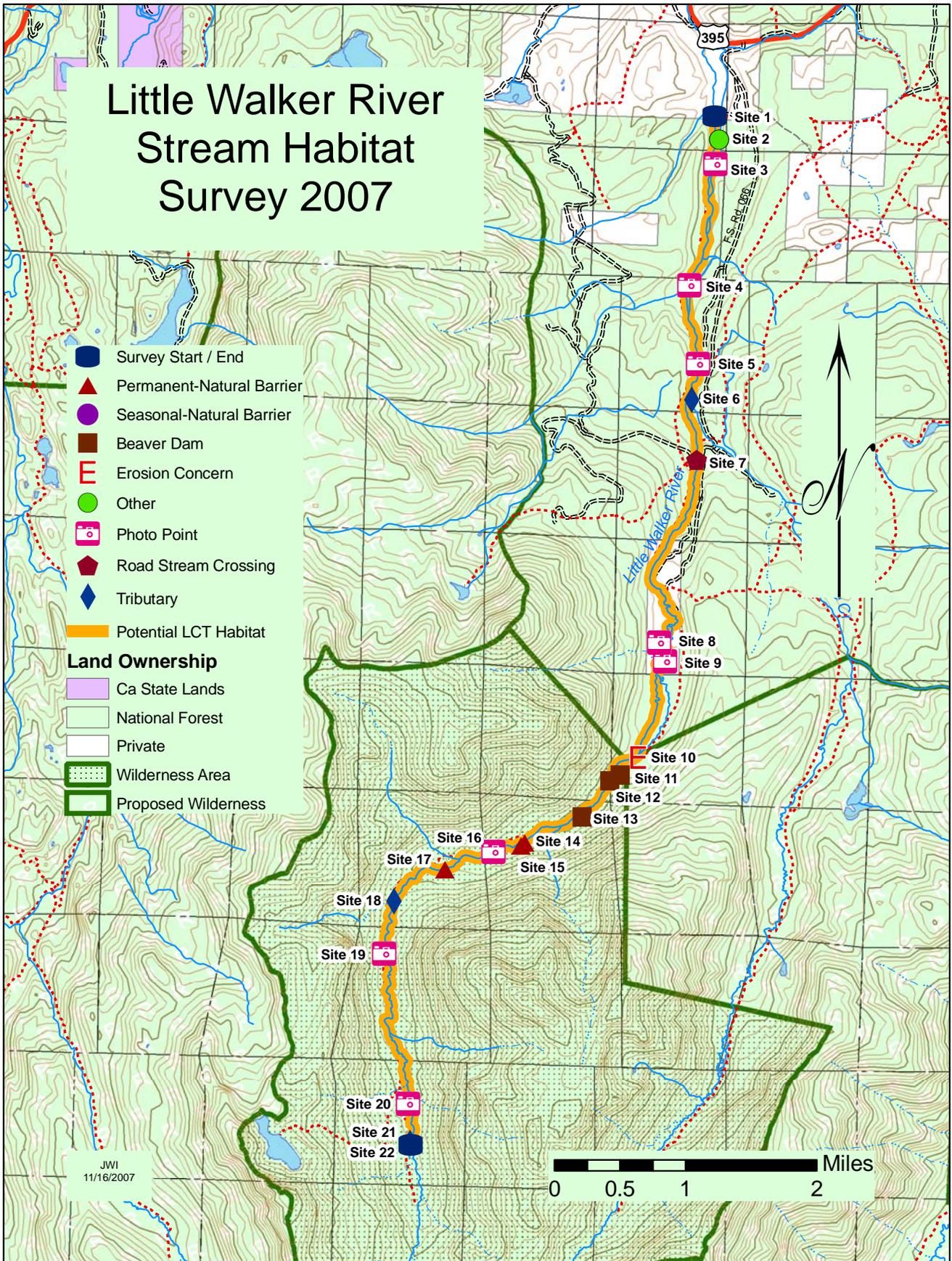
# Cottonwood Creek Stream Habitat Survey 2007



JWI  
11/7/2007

Map 27: Overview of Cottonwood Creek

# Little Walker River Stream Habitat Survey 2007

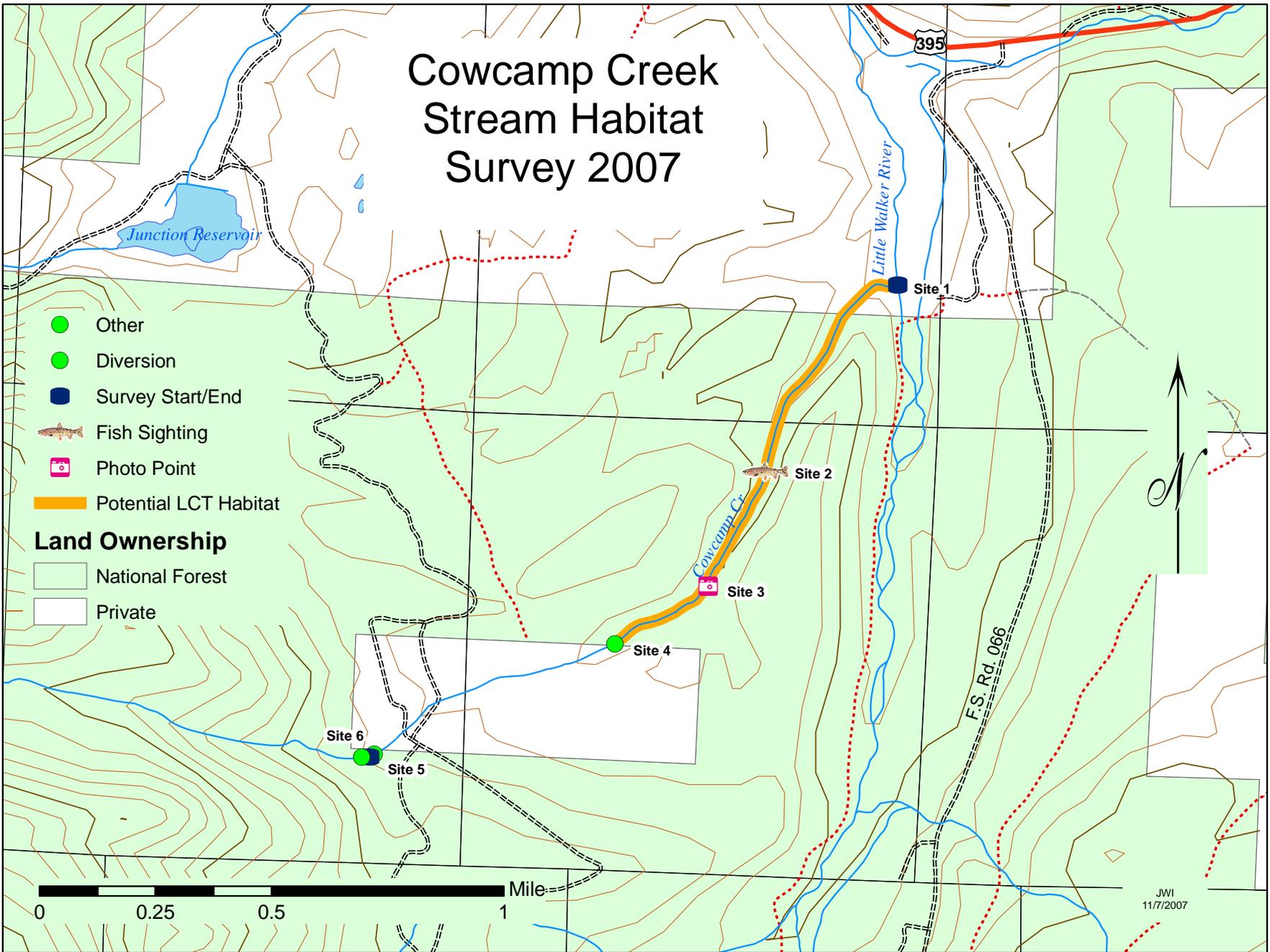


Map 28: Overview of Little Walker River

# Cowcamp Creek Stream Habitat Survey 2007

- Other
- Diversion
- Survey Start/End
- 🐟 Fish Sighting
- 📷 Photo Point
- ▬ Potential LCT Habitat

- Land Ownership**
- ▭ National Forest
  - ▭ Private

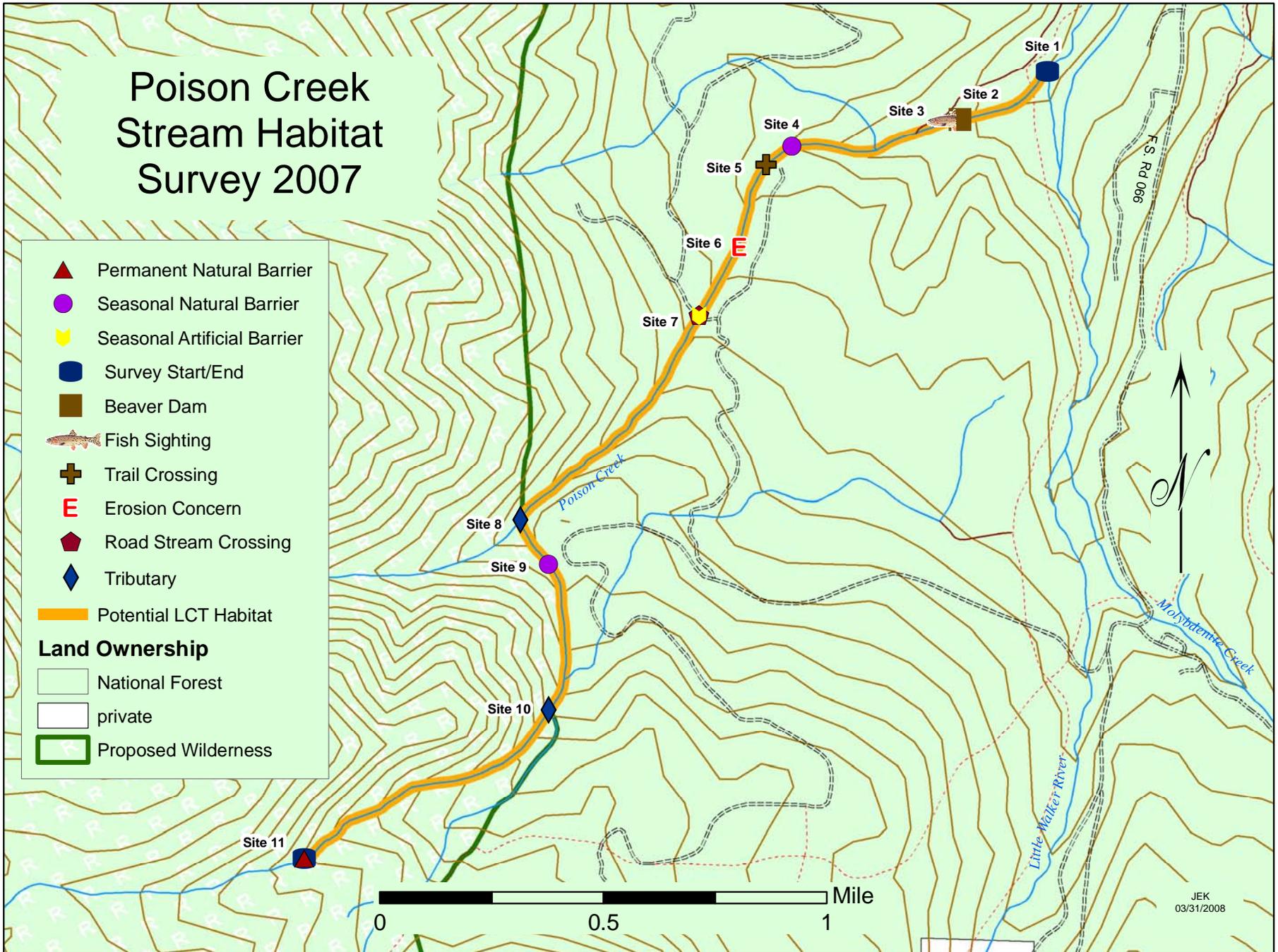


JWI  
11/7/2007

Map 29: Overview of Cowcamp Creek

# Poison Creek Stream Habitat Survey 2007

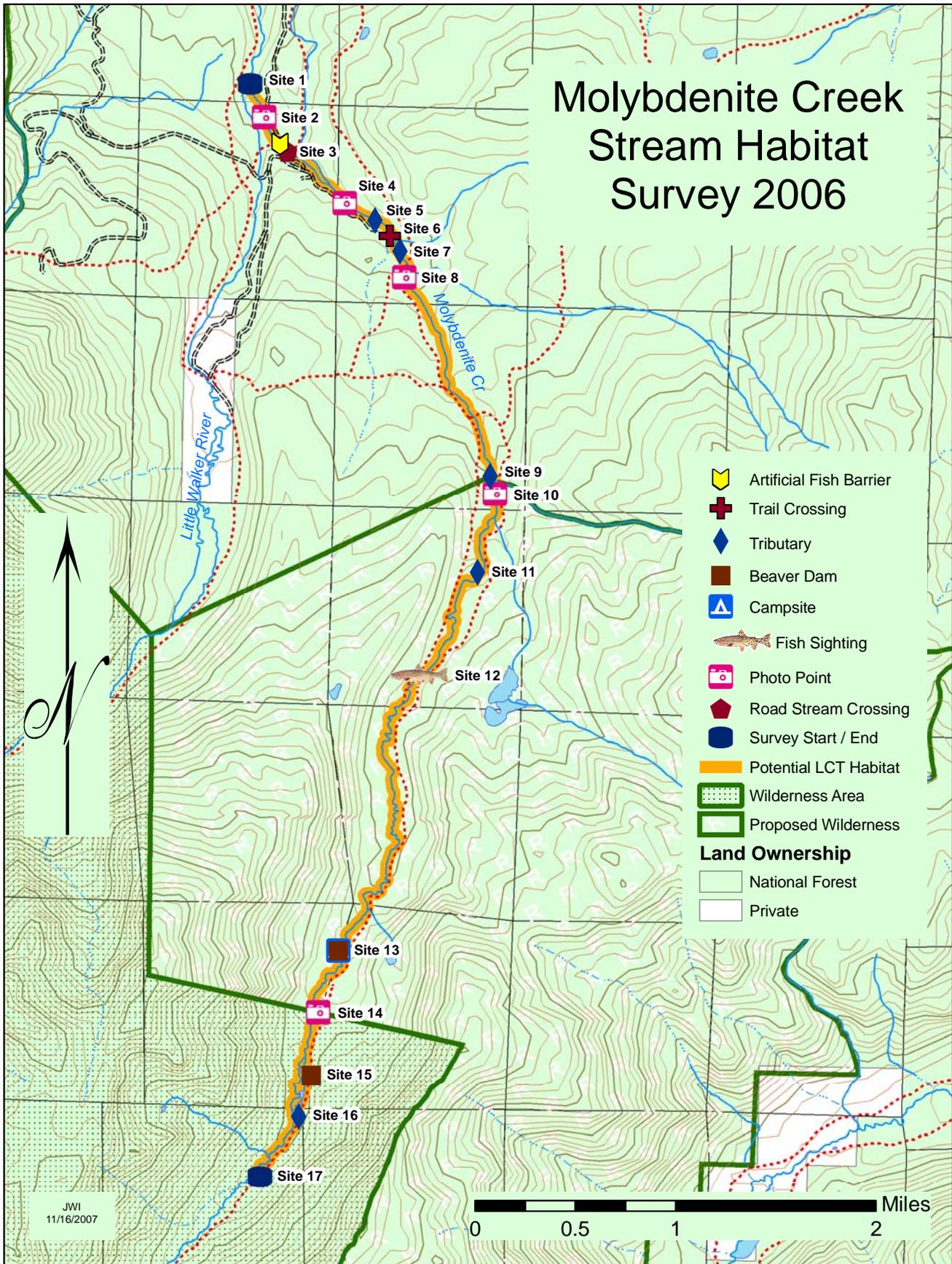
-  Permanent Natural Barrier
  -  Seasonal Natural Barrier
  -  Seasonal Artificial Barrier
  -  Survey Start/End
  -  Beaver Dam
  -  Fish Sighting
  -  Trail Crossing
  -  Erosion Concern
  -  Road Stream Crossing
  -  Tributary
  -  Potential LCT Habitat
- Land Ownership**
-  National Forest
  -  private
  -  Proposed Wilderness



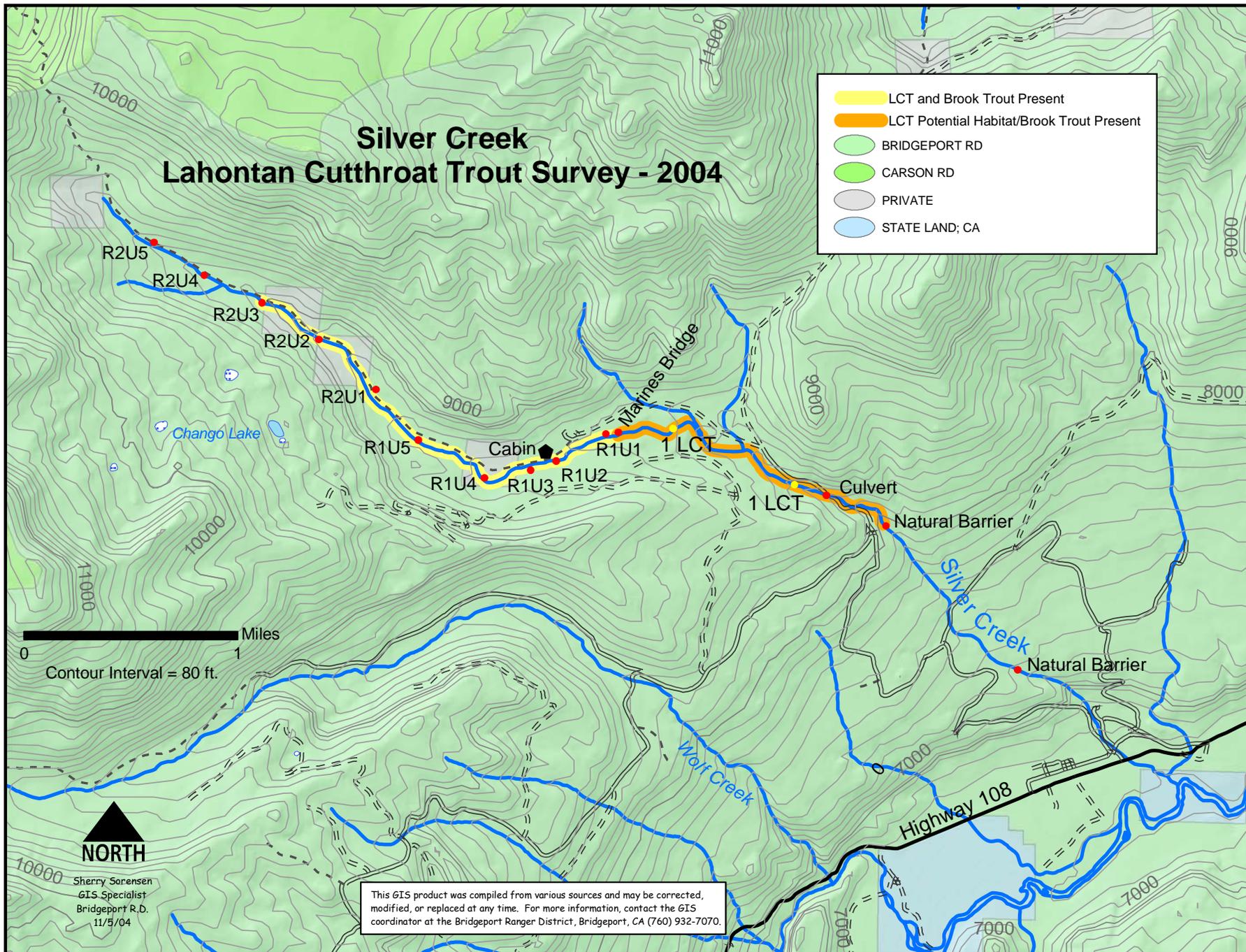
JEK  
03/31/2008

Map 30: Overview of Poison Creek

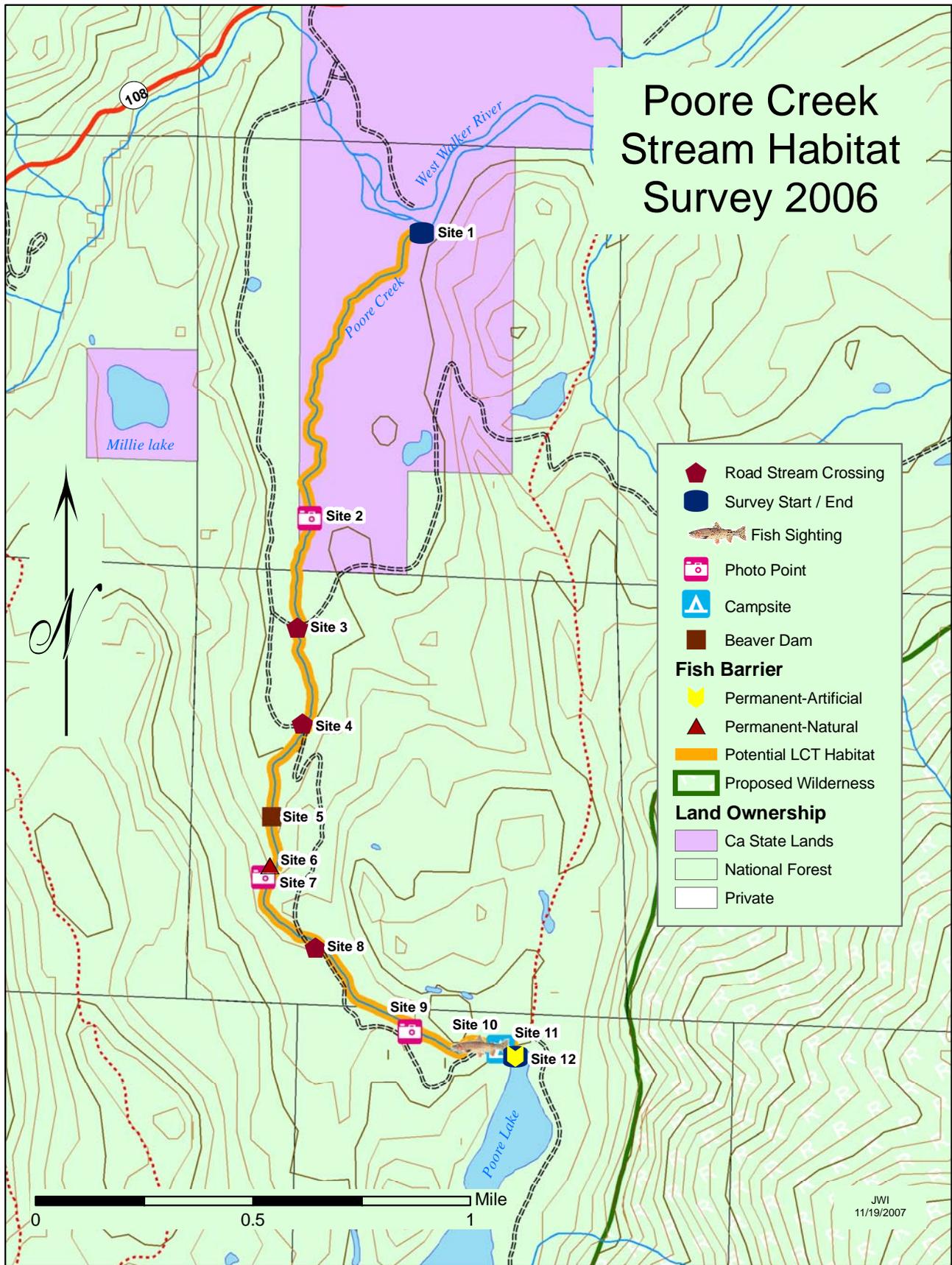
# Molybdenite Creek Stream Habitat Survey 2006



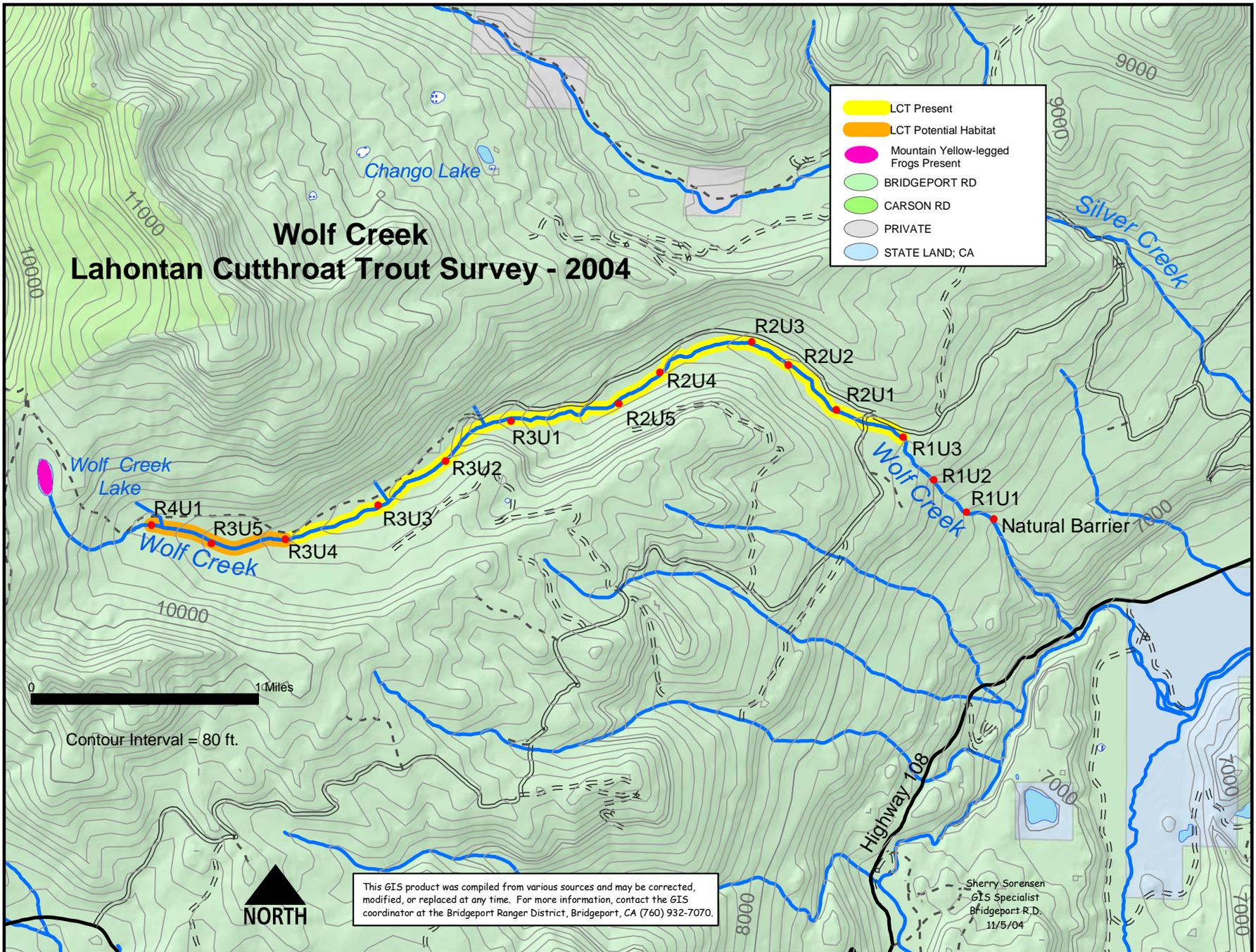
Map 31: Overview of Molybdenite Creek



Map 32: Overview of Silver Creek

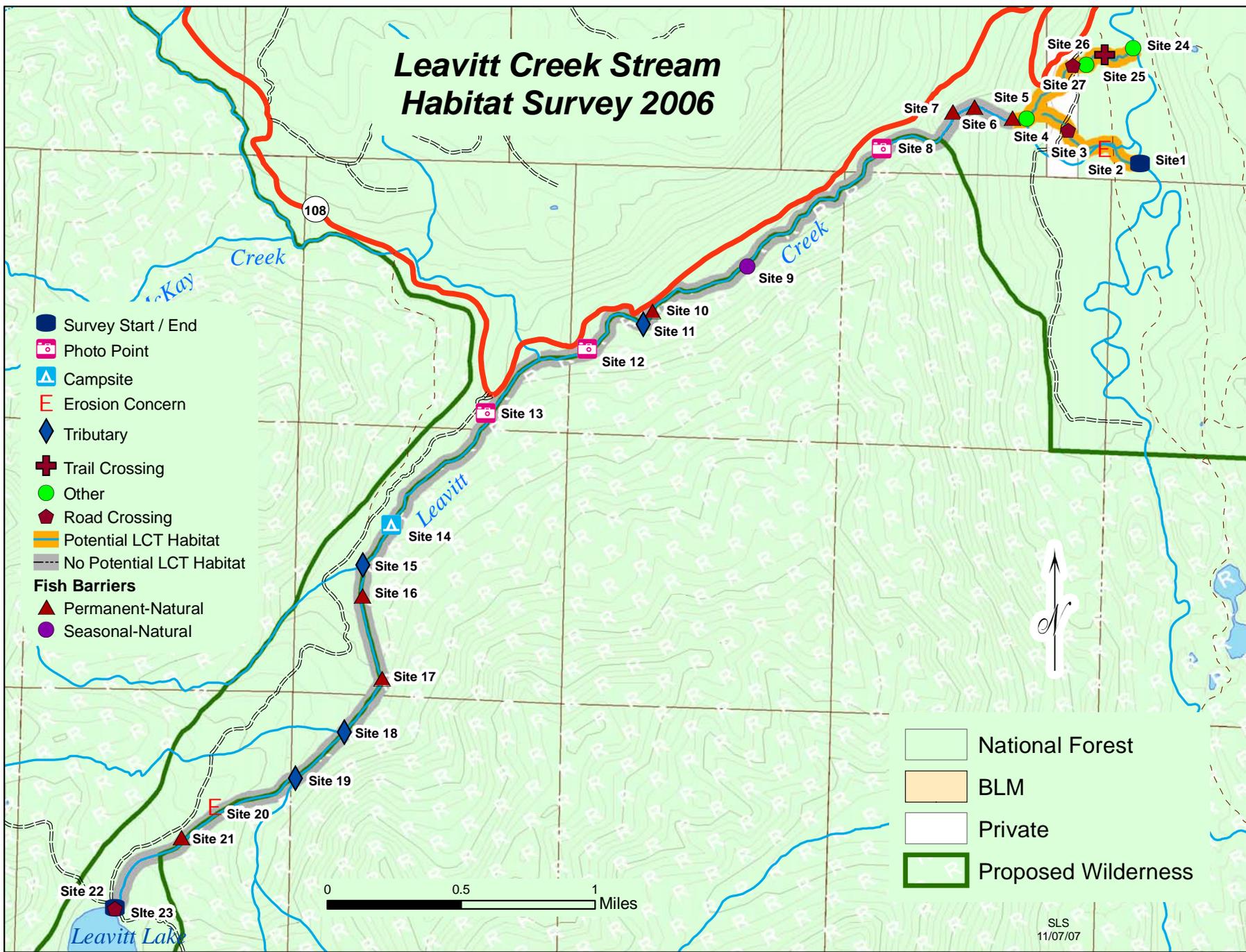


Map 33: Overview of Poore Creek



Map 34: Overview of Wolf Creek

# Leavitt Creek Stream Habitat Survey 2006



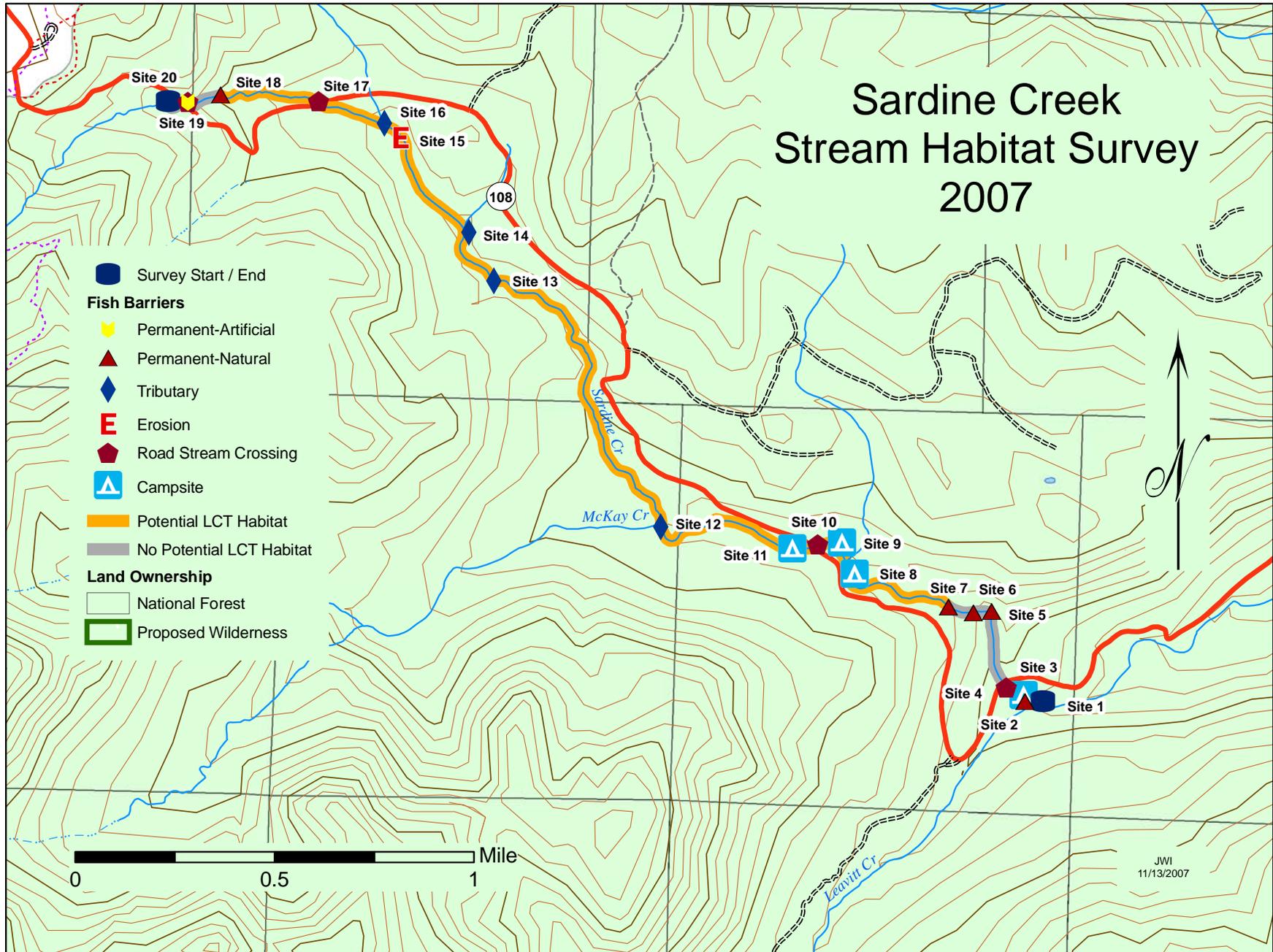
- Survey Start / End
- Photo Point
- ▲ Campsite
- E Erosion Concern
- ◆ Tributary
- + Trail Crossing
- Other
- ◆ Road Crossing
- ▭ Potential LCT Habitat
- ▭ No Potential LCT Habitat
- Fish Barriers**
- ▲ Permanent-Natural
- Seasonal-Natural

- ▭ National Forest
- ▭ BLM
- ▭ Private
- ▭ Proposed Wilderness

0 0.5 1 Miles

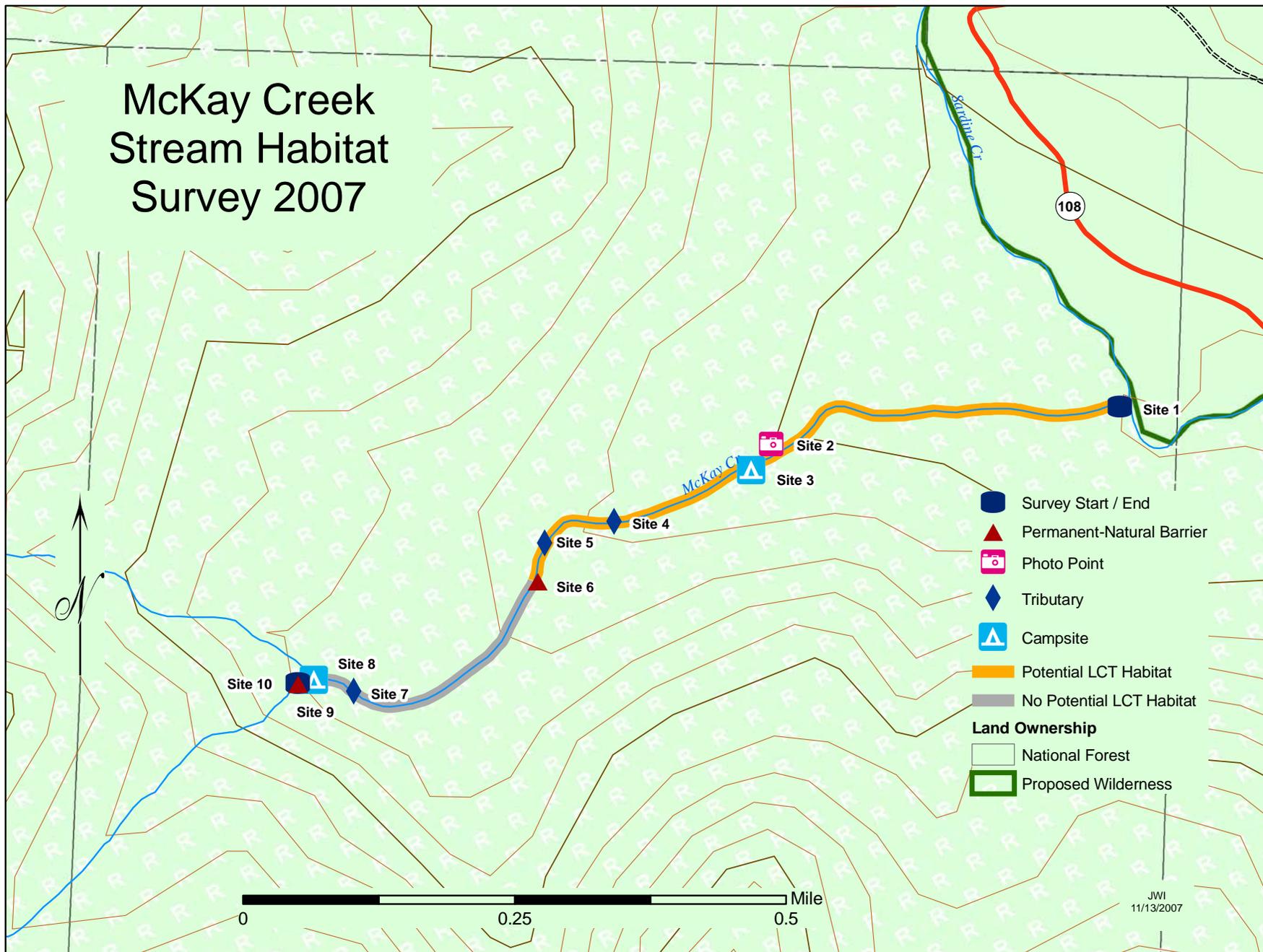
SLS  
11/07/07

Map 35: Overview of Leavitt Creek



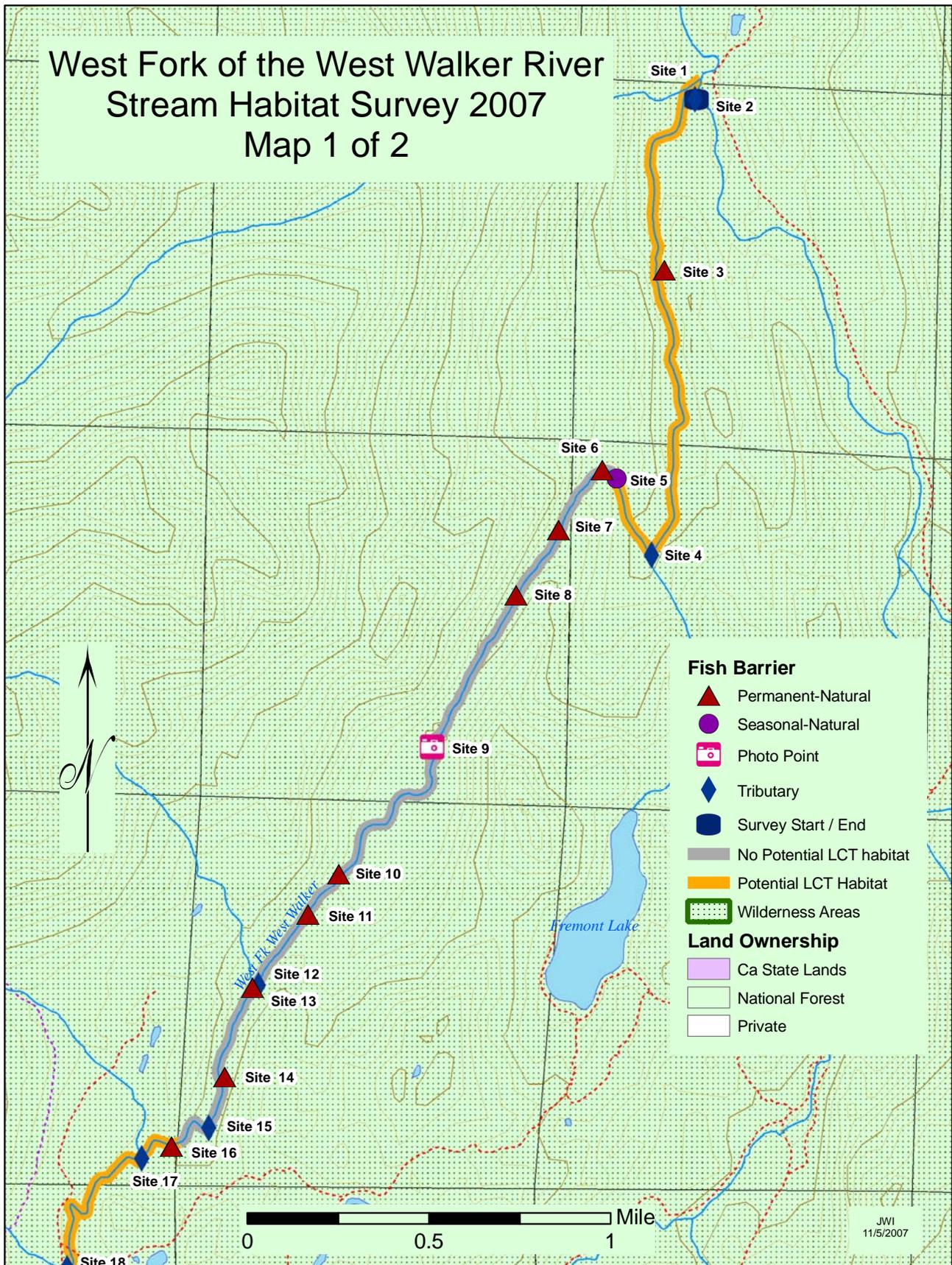
Map 36: Overview of Sardine Creek

# McKay Creek Stream Habitat Survey 2007



Map 37: Overview of McKay Creek

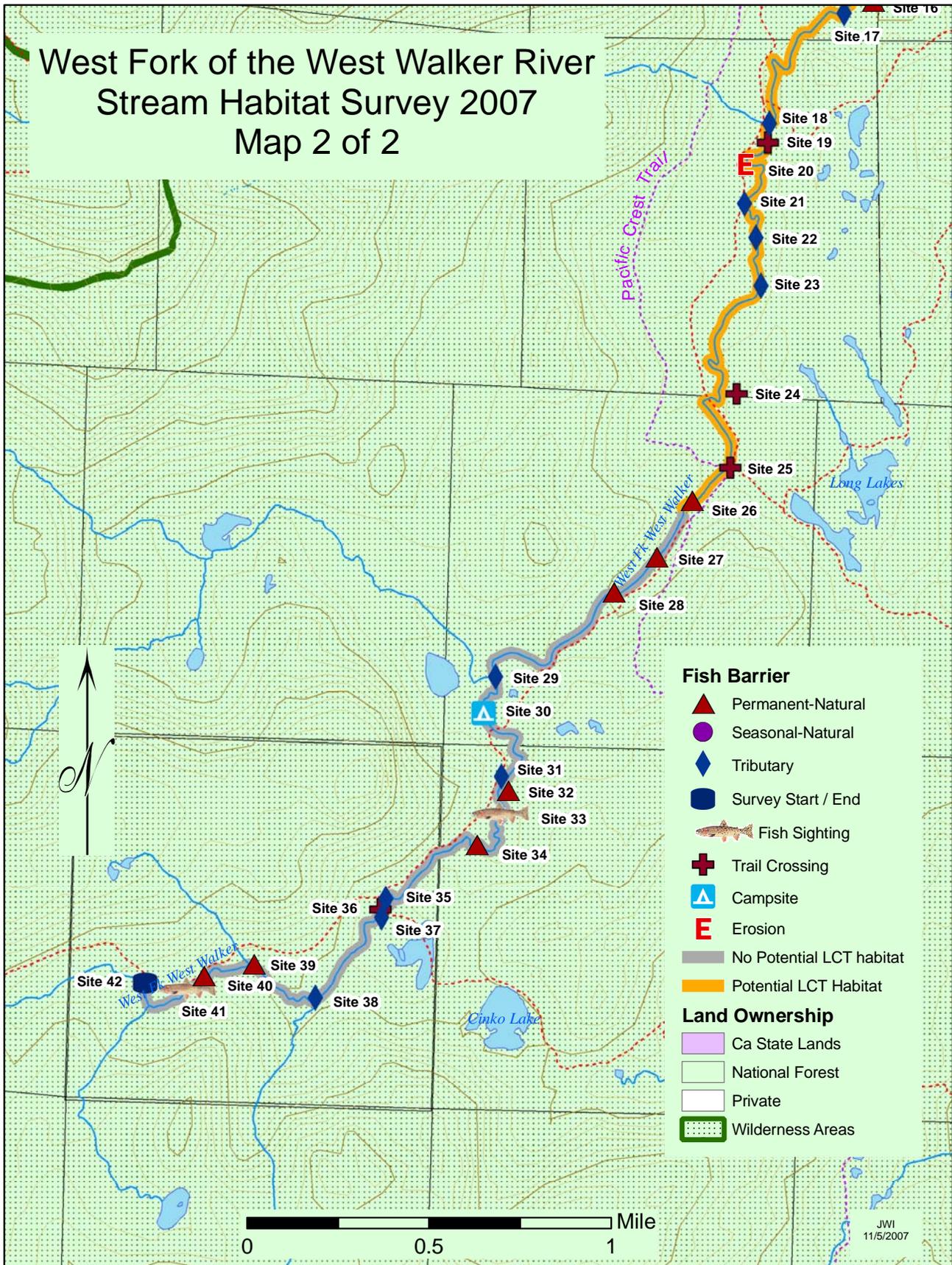
# West Fork of the West Walker River Stream Habitat Survey 2007 Map 1 of 2



Map 38: Lower West Fork West Walker River

JWI  
11/5/2007

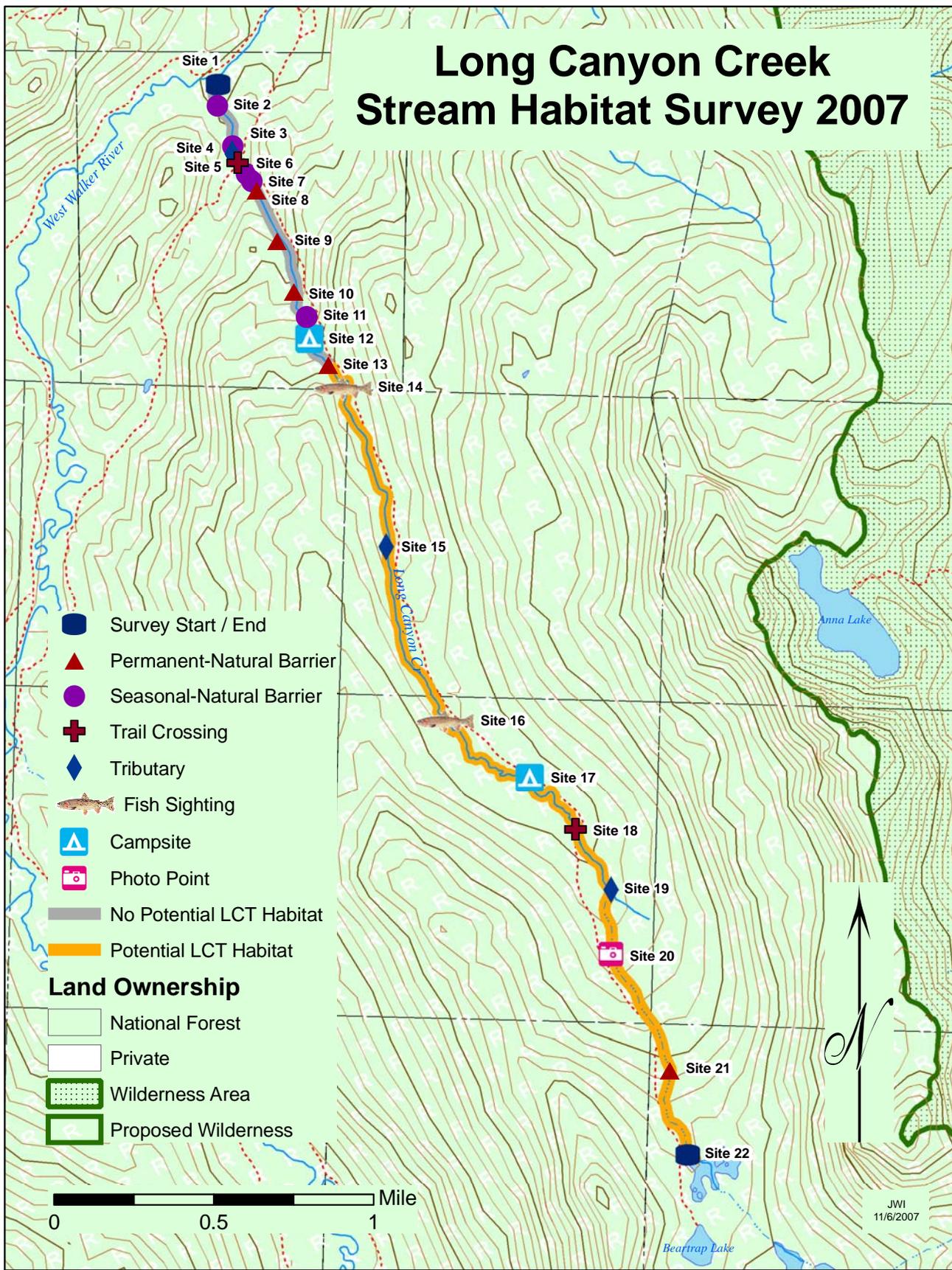
# West Fork of the West Walker River Stream Habitat Survey 2007 Map 2 of 2



Map 39: Upper West Fork West Walker River

JWI  
11/5/2007

# Long Canyon Creek Stream Habitat Survey 2007



Map 40: Overview of Long Canyon Creek