AQUATIC BIODIVERSITY MANAGEMENT PLAN

FOR THE

DESOLATION WILDERNESS MANAGEMENT UNIT

FINAL
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LIST OF ACRONYMS

ABMP	Aquatic Biodiversity Management Plan
AMMA	Long-toed salamander (*Ambystoma macrodactylum*)
Bd	Batrachochytrium dendrobatidis
BK	Brook trout (Salvelinus fontinalis)
BN	Brown trout (*Salmo trutta*)
BUBO	Western toad (*Bufo boreas*)
BUCA	Yosemite toad (*Bufo canorus*)
CDFG	California Department of Fish and Game
CNDDB	California Natural Diversity Database
CT-L	Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*)
DC	Speckled dace (*Rhinichthys osculus*)
EID	El Dorado Irrigation District
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
GSH	Golden shiner (Notemigonus crysoleucas)
GT	Golden trout (Oncorhynchus aquabonita)
HML	California Department of Fish and Game High Mountain Lakes Project
HYRE	Pacific tree frog (Hyla regilla, Pseudacris regilla)
LRS	Lahontan redside (*Richardsonius egregious*)
LT	Lake trout (Salvelinus naymaycush)
LTBMU	U.S. Forest Service Lake Tahoe Basin Management Unit
MYLF	Mountain yellow-legged frog
NCR	California Department of Fish and Game North Central Region (Region 2)
PWS	Planning watershed
RT	Rainbow trout (*Oncorhynchus mykiss*)
SNYLF	Sierra Nevada yellow-legged frog
THCO	Sierra garter snake (*Thamnophis couchii*)
THEL	Mountain garter snake (*Thamnophis elegans elegans*)
THSI	Common garter snake (*Thamnophis sirtalis*)
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
VES	Visual encounter survey

SECTION I

INTRODUCTION

1) OVERVIEW

In response to the observed decline of the Sierra Nevada yellow-legged frog, *Rana sierrae* (SNYLF), and federal Endangered Species Act of 1973 actions (detailed below) regarding the species, the California Department of Fish and Game (CDFG) initiated several actions to meet the state's responsibility to manage wildlife and their habitats for multiple uses. The two most important actions were 1) to temporarily suspend non-native fish stocking in high mountain lakes and 2) to initiate the High Mountain Lakes project (HML) which is an effort to inventory the aquatic vertebrate species (fish and amphibians) and their habitat between 1,370 to 3,660 meters elevation (4,500 to 12,000 feet) in the Sierra Nevada mountain range. Along with these two actions, a dialogue was initiated with researchers, other government agencies, and user groups to discuss management of the Sierra Nevada aquatic ecosystems.

The practice of introducing non-native fish in historically fishless headwater ecosystems of the western United States has created many productive fisheries and established angling as a recreational activity in high mountain lakes. As a result of these stocking practices there have been negative effects on the viability and biodiversity of native species populations (Bradford 1989, Lunte and Luecke 1990, Bahls 1992, Bradford et al. 1993, Drake and Naiman 2000, Knapp et al. 2001, Pister 2001, Dunham et al. 2004, Vredenburg 2004, Finaly and Vredenburg 2007, Pope 2008, Herbst et al. 2009). Introduction of non-native fish, primarily trout, into historically fishless headwater ecosystems of the western United States began in the 1800s with the western migration of European settlers. The practice of fish stocking in historically fishless waters became standard policy as state fish and wildlife agencies took primary responsibility for managing each state's fish and wildlife resources. The practice increased in scope with the advent of aerial fish stocking and has continued over the past century (Knapp 1996). In California, researchers have determined that non-native fish introduction is a primary factor in observed population declines of SNYLF, an endemic species of the Sierra Nevada mountain range (Bradford 1989, Bradford et al. 1993, Knapp and Mathews 2000, Knapp et al. 2001, Knapp 2005, Knapp et al. 2007).

SNYLF population declines led to federal Endangered Species Act of 1973 (ESA) actions which in turn led to pro-active state resource management actions. On February 10, 2000, the US Fish and Wildlife Service (USFWS) received a petition from the Center for Biological Diversity and the Pacific Rivers Council to list the Sierra Nevada population of the mountain yellow-legged frog as endangered under the Distinct Vertebrate Population Segment Policy of the federal Endangered Species Act of 1973. On October 12, 2000, the USFWS published a 90-day finding in the Federal Register stating, "The petition presented substantial scientific or commercial information to indicate that the listing of the Sierra Nevada population of the mountain yellow-legged frog may be warranted"

(USFWS 2007). The 90-day finding was followed by a 12-month petition finding, published on January 16, 2003 which states:

After review of all available scientific and commercial information we find that the petitioned action is warranted, but precluded by higher priority actions to amend the Lists of Endangered and Threatened Wildlife and Plants. Upon publication of this 12-month petition finding, this species will be added to our candidate species list. We will develop a proposed rule to list this population pursuant to our Listing Priority System (USFWS 2007).

Furthermore, the Prohibited Acts Section 9(1) (B) of the ESA, states that it is unlawful to "take any such species within the United States". Section 3 (19) states "The term 'take' means to harass, harm, pursue, hunt, shoot, wound, trap, capture, collect, or attempt to engage in any such conduct." Because fish stocking in the Sierra Nevada has been linked to declines in SNYLF populations the CDFG's aerial stocking program could potentially constitute "harm" and thus be considered "unlawful" under the provisions of the ESA.

However, Section 6 of the ESA "Cooperation with the States" provides for Management Agreements and Cooperative Agreements whereby the states can provide the federal government with a plan "which establishes and maintains an adequate and active program for the conservation of endangered species and threatened species". In anticipation of the federal listing of SNYLF, CDFG temporarily suspended aerial fish stocking in Sierra Nevada lakes and implemented an informal Sierra Nevada fish stocking policy within the historic range of SNYLF and the mountain yellow-legged frog, *Rana muscosa* (MYLF) which states that:

- Fish will not be stocked in lakes with known populations of SNYLF or MYLF, nor in lakes which have not yet been surveyed for frog presence;
- Waters will be stocked only with a fisheries management justification;
- The number of stocked lakes will be reduced over time; and
- Water bodies within the same basin and 2 kilometers (1.24 miles) from a known population of SNYF or MYLF will not be stocked without a management plan that considers all aquatic resources in the basin, or unless there is heavy angler use and no opportunity to improve habitat for native amphibians.

The CDFG concurrently implemented the HML project which is designed to determine the status and distribution of SNYLF and MYLF populations, introduced fish species, and other amphibian species in applicable water bodies in the Sierra Nevada. This continuing program is closing the gap in baseline data necessary to develop biologically sound long term aquatic biodiversity management plans specific to hydrologic basins of the Sierra Nevada. The CDFG anticipates that development and implementation of these plans will help stabilize and reverse negative effects of non-native fish introductions on native

frog populations while maintaining viable recreational angling as a historic use pattern in a manner consistent with both the mission of the CDFG and the guidelines set forth in the federal ESA.

2) FACTORS AFFECTING THE SIERRA NEVADA YELLOW-LEGGED FROG AND THE MOUNTAIN YELLOW-LEGGED FROG

The following factors have been identified as negatively affecting SNYLF and MYLF populations in the Sierra Nevada (USFWS 2007)

- Non-native fish introduction,
- Batrachochytrium dendrobatidis (Bd)
- Pollution,
- Livestock grazing,
- Recreation,
- Dams, reservoirs, and water diversions,
- Timber management, and
- Road construction and maintenance

Although there are many factors that have played a role in the decline of amphibian populations, the body of scientific literature identifies the introduction of non-native fish to historically fishless waters as one of the leading causes of population declines (Bradford 1989, Bahls 1992, Bradford et al. 1993, Drake and Naiman 2000, Knapp and Mathews 2000, Knapp et al. 2001, Pilliod and Petersen 2001, Dunham et al. 2004, Vredenburg 2004, Knapp 2005, Knapp et al. 2007).

SNYLF and MYLF have a life history unique among amphibians in the Sierra Nevada, in that they spend virtually all their lives in or very near a water source. This life history trait requires that larval, sub-adult, and adult life stages over-winter in lakes that do not completely freeze. Larvae, in particular, over-winter for up to four years before metamorphosing to the sub-adult life stage (Stebbins 2003). Due to this unique trait, SNYLF and MYLF require the same deep water habitats which are able to support fish. Furthermore, fish have been introduced to the vast majority of the large interconnected lakes that also provided high quality frog habitat. Once fish have been introduced into a lake, SNYLF and MYLF must contend with a non-native predator and are, over time, relegated to portions of the lakes that do not contain fish habitat or to ponds adjacent to the lake. These are often isolated habitats of marginal size and quality which are capable of supporting small tenuous frog populations, vulnerable to localized extinctions.

In addition to predation by non-native fish, SNYLF and MYLF declines have been heavily driven by the introduction of an infectious disease to the waters of California. *Batrachochytrium dendrobatidis* (Bd) is a fungus that infects amphibian species causing the disease chytridiomycosis (Berger et al. 1998, Longcore et al. 1999). This disease is often fatal for amphibians and has been associated with amphibian declines throughout the world (Ouellet et al. 2005, Skerratt et al. 2007). In the case of SNYLF and MYLF, Bd has been identified as a principal mechanism for localized extinction of isolated populations (Fellers et al. 2001, Rachowicz and Vredenburg 2004, Rachowicz et al. 2006, Fellers et al. 2007, Rachowicz and Briggs 2007). Therefore, factors such as Bd distribution, presence or absence, and infection level must be taken into consideration when developing recovery strategies for SNYLF or MYLF populations.

While the CDFG recognizes that all the aforementioned factors negatively affect native frog populations, the CDFG has primary authority over fish stocking programs in the Sierra Nevada and limited ability or authority to control the other factors leading to the decline of the species.

3) MANAGEMENT PLAN OBJECTIVES

In California, rigorous evaluation of fish stocking strategies has often been lacking, thus the long term effects of these practices are not fully understood (Bahls 1992). In light of the negative effect fish introduction has had on native amphibian populations, re-evaluation of all Sierra Nevada stocking allotments is necessary. In 1999, the CDFG finalized and began implementing an aquatic biodiversity management plan for the Big Pine Creek Wilderness Basin of the Sierra Nevada. That management plan addressed both CDFG's public trust responsibilities toward the management and protection of native aquatic species and CDFG's historic and future management of fishery resources in the basin. Management actions identified in the plan were based upon recent site-specific data on fish and amphibian populations and public resource use. Implementation of the plan has resulted in improvements to several important fisheries, including increases in fish size and the establishment of a trophy golden trout fishery. Where non-native fish populations were removed, large increases of native aquatic invertebrate and amphibian populations have been documented and a robust food web benefiting both aquatic and terrestrial native fauna has been reestablished.

Following the management plan model of Big Pine Creek, the following objectives were used to develop the Desolation Wilderness Aquatic Biodiversity Management Plan:

Objective 1: Manage high mountain lakes and streams in a manner which maintains or restores native biodiversity and habitat quality, supports viable populations of native species, and provides for recreational opportunities considering historical and future use patterns. In some areas, most or all of the waters may be managed as natural reserves with little or no angling available. Likewise, in areas of high recreational demand, most or all of the lakes may be managed for recreational angling.

Objective 2: Trout stocking allotment changes will be based on site-specific data collected within the last 5 years.

Objective 3: For each lake, the species, frequency, and number of trout stocked will be guided by the following provisions:

- Lakes with existing populations of SNYLF or MYLF should not be stocked with fish. Where a population exists within two kilometers (1.24 miles) of an established high mountain lake fishery, an assessment of fishing use and the feasibility of trout removal should be made to determine if the water could be converted to a fishless condition. Wilderness fisheries management should incorporate objectives of the USFWS Conservation Strategy, when available.

- Stocking waters in areas with other amphibians that are CA Species of Concern, such as the Yosemite toad, *Bufo canorus,* will be reviewed on a case-by-case basis.

- After achieving the aquatic native biodiversity objectives above, high mountain lakes could be managed to optimize angling opportunities within a given basin. For example, some lakes might be managed for trophy-sized fish, some for fast-action on smaller-sized fish, and others for angling species diversity.

- California native trout species will be given priority over other trout species, especially within their native watersheds, and stocked into waters following the guidelines of the CDFG Strategic Plan for Trout Management and/or Fish and Game Commission Policies as appropriate.

- Trout should not be stocked into waters with existing self-sustaining trout populations unless necessary to meet broader management goals for angling diversity, trophy fishing, fast-action fishing, or research.

4) RESOURCE ASSESSMENT METHODS

Resource assessments were conducted for all lentic waters within the management unit. These waters were located on public land and identified on USGS 7.5 minute series maps. Each mapped water body was assigned a unique identification number (Lake ID). Unmapped waters found in the field by survey crews were assigned a unique two-decimal suffix added to the Lake ID of the nearest mapped water body.

Fish and amphibian surveys were conducted following protocols originally designed by Fellers and Freel (1995) and modified by Knapp (pers. comm.). The CDFG further revised these protocols to meet program needs. Data used in this management plan were collected from 2003 to 2008 by CDFG with additional data from Eldorado National Forest and Lake Tahoe Basin Management Unit (LTBMU). Fish population surveys were conducted using experimental variable mesh monofilament gill nets deployed near the outlet(s) of the lake. Gill nets were set in waters that contained fish or where fish presence could not be discounted. Amphibian populations were surveyed using the visual encounter survey protocol (VES) from Fellers and Freel (1995). Physical habitat features (e.g., stream and lake spawning substrate, littoral substrate, stream widths and depths, maximum lake depths, and the presence of fish barriers) were recorded on data sheets or electronic personal digital assistants.

Survey protocols targeted SNYLF and MYLF and were not designed to document the presence of certain amphibian and reptile species that are primarily terrestrial or nocturnal. Assessment of these non-target species would require additional survey methodologies and protocols to inventory. All species observed were recorded although non-target species are considered incidental sightings because protocol level surveys were not conducted for these species.

5) FISHERIES MANAGEMENT TECHNIQUES

High mountain lake fisheries can be grouped into two types: self-sustaining fisheries and stocked fisheries. Self-sustaining fisheries have enough suitable spawning habitat for natural reproduction to maintain the fishery without additional stocking. For most trout species the habitat requirement for natural

reproduction is access to oxygenated stream gravel. However, brook trout and non-game species such as golden shiners and bullhead are capable of reproducing where stream spawning habitat is not accessible.

A stocked fishery is often more complicated as it may or may not be self-sustaining. Stocked fisheries can be loosely divided into two groups: put-and-grow fisheries and stocking supplemented fisheries. Put-and-grow fisheries must be maintained through continued fish stocking because natural reproduction is either nonexistent or occurs too infrequently to sustain a population. Stocking supplemented fisheries are self-sustaining and would persist without additional stocking but are stocked to meet fisheries management goals. Examples of these management objectives include but are not limited to increasing catch rate, increasing species diversity, or controlling undesirable self-sustaining species.

Certain management objectives may call for a reduction in the numbers or densities of fish in a population. If, for instance, the management goal is to increase the average fish size, reduce the catch rate or control an undesirable species, it may be necessary to reduce the numbers of fish or fish densities. Densities of stocked fish species in a put-and-grow fishery can be easily reduced by reducing the number of fish stocked or the frequency of stocking events. However, reducing fish density is often difficult in populations with natural reproduction. In the case of high mountain fisheries with natural reproduction, there are typically only two methods available. One option is to stock the lake with an aggressive piscivorous species which will predate upon the target species. Otherwise, the target species can be actively suppressed using traps, gill nets and/or electrofishing. Both techniques are experimental in nature and have not been widely implemented.

6) AMPHIBIAN MANAGEMENT TECHNIQUES

Most amphibian species found in the Sierra Nevada do not directly compete with non-native fish for available habitat and resources. Thus water bodies managed for fisheries and for amphibians can occur in close proximity to each other without conflict. The vast majority of water bodies that contain amphibians but do not have fish are managed as an amphibian resource. An amphibian resource is defined as an aquatic habitat that has evidence of amphibian breeding and is not a fishery. Most commonly this management designation is assigned to small, ephemeral ponds that provide rearing habitat for Pacific tree frog larvae, *Pseudacris regilla* (*Hyla regilla;* HYRE). Also included in this category are fishless perennial lakes with breeding SNYLF or MYLF populations and small ponds and lakes with evidence of long-toed salamander (*Ambystoma macrodactylum*, AMMA) breeding.

Where there are conflicts between SNYLF or MYLF populations and non-native fish, more aggressive management techniques are often necessary. Under current CDFG policy, certain native amphibians (e.g., CA Species of Concern, or State or Federal listed threatened or endangered species) may be given management priority over introduced fishes. If restoration of appropriate aquatic habitats to a fishless condition is feasible and beneficial to native amphibians, CDFG has a responsibility to restore those habitats. While recovery is never guaranteed it is important to note that CDFG has witnessed fish removal projects leading to dramatic recovery of extirpation-trending SNYLF populations. Although, recovery of certain amphibian species is a strong focus of fish-population-removal projects, other native species are also expected to benefit (Sarnelle and Knapp 2004, Finlay and Vredenburg 2007, Knapp and Sarnelle 2008, Pope 2008, Herbst et al. 2009).

Fish Removal Techniques

CDFG has grouped fish removal into three broad categories:

- Category 1 fish removal is a project that CDFG has deemed feasible and will not negatively affect public use and/or recreational angling opportunities.
- Category 2 fish removal is feasible but presents conflicts with current public use patterns and/or will negatively affect angling opportunities within the basin.
- Category 3 fish removal projects may or may not have public use concerns, but are not feasible without the use of chemical treatments.

There are a variety of techniques for fish removal, however many traditional methods cannot be implemented in high mountain locations accessible only by trail. The simplest method is passive fish removal. This entails discontinuing stocking at a fishery that is not self-sustaining and allowing the lake to revert to a fishless condition. However, by using this method it could take many years for fish to die and decades for the lake to revert to a fishless condition (Knapp et al. 2001). If a fishless condition is desired in a shorter timeframe or the fishery is self-sustaining, an active technique must be employed. Mechanical fish removal is the most common method currently implemented by CDFG in the Sierra Nevada. Large numbers of gill nets are used to capture adult fish and break the reproductive cycle. Electrofishers are used to remove fish from tributaries and shallow lake fringes. Additionally, gill nets may be set under ice and fish throughout the winter months. However, mechanical removal requires extensive effort over several years and is only effective in smaller lakes that have limited stream spawning habitat. These smaller lakes comprise approximately 15 to 20 percent of Sierra Nevada aquatic habitats (Knapp and Mathews 1998). Large lakes or lakes with complicated tributaries can be reverted to a fishless condition through the use of a piscicide such as rotenone. Although chemical treatments were commonly utilized in the past, they are currently controversial and costly

endeavors. To date, CDFG has not implemented any chemical treatment projects for the singular purpose of amphibian restoration.

Translocation Techniques

When habitat is not available for a threatened amphibian population or if fish removal is not feasible in adjacent lakes, translocation may be necessary to stabilize and expand the population. Translocations must be implemented carefully, with thorough consideration of local genetics and pathology. Animals should not be moved between Bd positive and Bd negative waters. The source population(s) and destination water(s) must all be Bd negative or Bd positive. Whenever possible the destination water should be within the same basin as the source population. If more than one source population is available, animals from all available populations may be translocated to increase genetic diversity within the destination population. CDFG has found that larval life stages are the easiest to collect and transport using an oxygenated water filled bag kept at a low temperature. Seeding should occur multiple times per season over the course of several years to inoculate the destination water with multiple cohorts of animals.

7) MONITORING

A continuous monitoring program is necessary to assess resource changes, measure the effects of past management, and evaluate the effectiveness of new management decisions. The following monitoring guidelines are proposed in this plan:

- Monitoring surveys are conducted using the current standard CDFG HML survey protocol or pertinent portion of the protocol. For example, if a fish population is monitored, the complete fish survey protocol is conducted. This will ensure data collected in different years by different crew members are comparable.

- Long term monitoring of amphibian populations should occur at the same time of year, whenever possible, to minimize variance from temporal behavior patterns.

- Extra effort can be applied when monitoring fish or amphibian populations with extremely low densities. For example, a gill net may be set longer than the maximum of twelve hours stated in the protocol if it is known that few or no fish are present in the lake.

- If monitoring for a species not expressly targeted by the HML protocol, the standard CDFG protocol for that species will be used. If no CDFG protocol exists, a USFWS, US Forest Service (USFS) or other accepted protocol will be used.

SECTION II

MANAGEMENT SETTING AND RESOURCES



1) ENVIRONMENTAL SETTING

The Desolation Wilderness is located in the Sierra Nevada mountain range in northern California, immediately west of Lake Tahoe. The wilderness boundary straddles the crest of the Sierra Nevada and the watersheds to the west of the divide drain to the American River while those on east side of the divide drain into Lake Tahoe. Two national forests manage the wilderness area, the Eldorado National Forest on the west slope and the LTBMU on the east slope.

The wilderness encompasses approximately 25,900 hectares (64,000 acres) of montane and sub-alpine habitats ranging from 1,890 m elevation (6,200 feet) to the summit of Pyramid Peak at 3,043 m (9,983 feet). Approximately 500 lakes and ponds have been mapped within the wilderness boundary.

The CDFG, in keeping with the Strategic Plan for Trout Management (Hopelain 2003), has adopted a watershed scale approach to management planning. Therefore, the Desolation Wilderness management unit, as defined by CDFG, includes habitats outside of the Desolation Wilderness boundary but within watersheds that originate in the wilderness. Seventeen CalWater 2.2 planning watersheds (PWS) are wholly or partially contained by the boundary of the Desolation Wilderness and make up the CDFG Desolation Wilderness management unit (Fig. 1). As a result, the Desolation Wilderness management unit is over twice as large as the wilderness area itself covering approximately 54,390 hectares (134,400 acres) and over 600 water bodies.

The wilderness has high visitor use especially along Wrights Lake Road, Highway 50 and Highway 89 access points. The northern side of the wilderness is accessed by lengthy 4WD routes and receives significantly less visitation (Fig. 2). The Pacific Crest Trail runs north-south along the length of the wilderness and is a convenient corridor for wilderness users (Muskopf 2009 pers. comm.).

2) HERPETOFAUNA RESOURCES

Numerous native amphibian species are found within the Desolation Wilderness including SNYLF. The foremost SNYLF population in the Desolation Wilderness is located in Desolation Valley within the Pyramid Creek PWS. There are 19 known perennial breeding locations and approximately 40 additional water bodies which form complexes of diverse, networked foraging habitat. Absolute numbers of individuals are difficult to determine, but the population likely consists of hundreds of adult and sub-adult frogs and thousands of larvae. This

population is one of the most robust known to exist within CDFG North Central Region (NCR).

There are five lesser SNYLF populations located throughout Desolation Wilderness Planning unit. They are located in the Twin Lakes basin, Clyde Lake, Pyramid Peak Lake, Highland Lake, Leland Lakes and Zitella Lake. These locations have small breeding populations and/or restricted access to habitat networks by fish-bearing waters. Populations such as these can often experience dramatic recovery if additional habitat is reclaimed via fish removal projects. Additionally, two other breeding locations have been documented at Cagwin Lake and Gertrude Lake. Monitoring data at these locations are indicative of an extinction trajectory and these populations may become extirpated despite fish removal efforts.

Bd samples were collected by CDFG at every SNYLF population within the Desolation Wilderness management unit in 2008. Individuals tested positive for Bd at every population except Pyramid Peak Lake and Zitella Lake.

The Desolation Wilderness is host to a number of additional amphibian and reptile species which have been less negatively affected by the introduction of non-native fish and Bd. Among these species are the widely distributed Pacific tree frog (*Hyla regilla* or *Pseudacris regilla*, HYRE) and western toad (*Bufo boreas*, BUBO). The long-toed salamander (*Ambystoma macrodactylum*, AMMA), a California Species of Concern, has been found in numerous small ponds and lakes. Another California Species of Concern, the Mount Lyell salamander (*Hydromantes platycephalus*) Lastly, three species of garter snakes; the common garter (*Thamnophis sirtalis*, THSI), the mountain garter snake (*Thamnophis elegans elegans*, THEL), and Sierra garter snake (*Thamnophis couchii*, THCO) frequent aquatic habitats in order to forage on adult frogs, toads, salamanders, and their larvae, as well as on fish and aquatic insects.

3) FISHERIES RESOURCES

In the waters of the Sierra Nevada mountain range above 1400 m (4,600 feet) only 20 lakes historically contained fish and all other headwaters ecosystems were naturally fishless due to impassable barriers to upstream fish passage (Moyle et al. 1996). Golden trout (*Oncorhynchus aquabonita*) and the Kern River rainbow trout (*Oncorhynchus mykiss*) of the upper Kern River Basin and the Sacramento sucker (*Catostomus occidentalis)* in the Kern River were the only native fishes to the higher elevations of the Sacramento-San Joaquin River drainage. The Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*) and Paiute cutthroat trout (*Oncorhynchus clarkii seleneris*) were the only native trout

species in the Lahontan Basin, which includes the Carson River, Susan River, Truckee River, Walker River, and Lake Tahoe drainages (Moyle et al. 1996, Moyle 2002). Non-trout species native to the Lahontan Basin include the Lahontan redside (*Richardsonius egregius*), Tahoe sucker (*Catostomus tahoensis*), mountain sucker (*Catostomus platyrhynchus*), Tui chub (*Gila bicolor*), Paiute sculpin (*Cottus beldingi*), and mountain whitefish (*Prosopium williamsoni*). Natural lakes in these watersheds, including Donner Lake, Eagle Lake, Fallen Leaf Lake, Cascade Lake, Independence Lake, Webber Lake, Upper and Lower Echo Lakes and Lake Tahoe, also contained these native fish species.

Beginning in the 1800s non-native fish were introduced to virtually every headwater ecosystem in the Sierra Nevada, including the Desolation Wilderness, by a wide variety of groups. The stocking records from this period are either poor or non-existent; some historical accounts are documented in personal journals and historical documents (Dill and Cordone 1997). Currently, CDFG has jurisdiction over fish stocking programs in the Sierra Nevada and has maintained reliable fish stocking records since the early- to mid-1900s. Brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), golden trout, Lahontan cutthroat, and rainbow trout, are the most commonly introduced fish species. Other less common species introduced to the Sierra Nevada include artic grayling (*Thymallus arcticus*), bullhead (*Ictalurus sp.*), carp (*Cyprinus carpio*), goldfish (*Carassius auratus*), hitch (*Lavinia exilicauda*), golden shiner (*Notemigonus crysoleucas*), king salmon (*Oncorhynchus tshawytscha*), kokanee salmon (*Oncorhynchus nerka*), lake trout (*Salvelinus naymaycush*), speckled dace (*Rhinichthys osculus*), sunfish (*Lepomis sp.*), and Tui chub (*Gila bicolor*).

Many of these species have been introduced to the Desolation Wilderness with varying success. Currently, brown trout, brook trout, golden trout and rainbow trout are the most common species encountered. Lake trout are found in at least two lakes and a small number of lakes have introduced forage species such as Lahontan redsides and golden shiners.

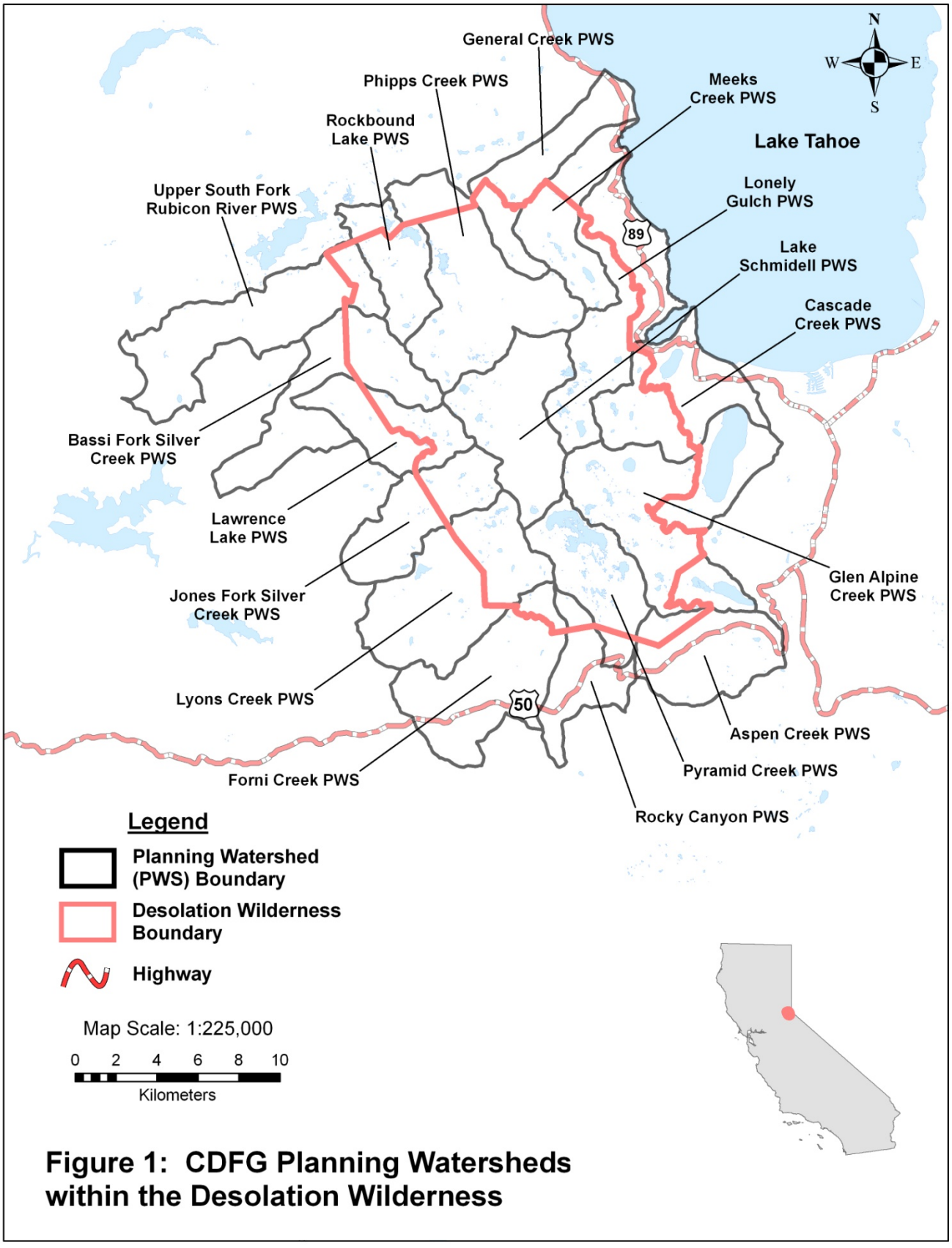

Figure 1: CDFG Planning Watersheds within the Desolation Wilderness

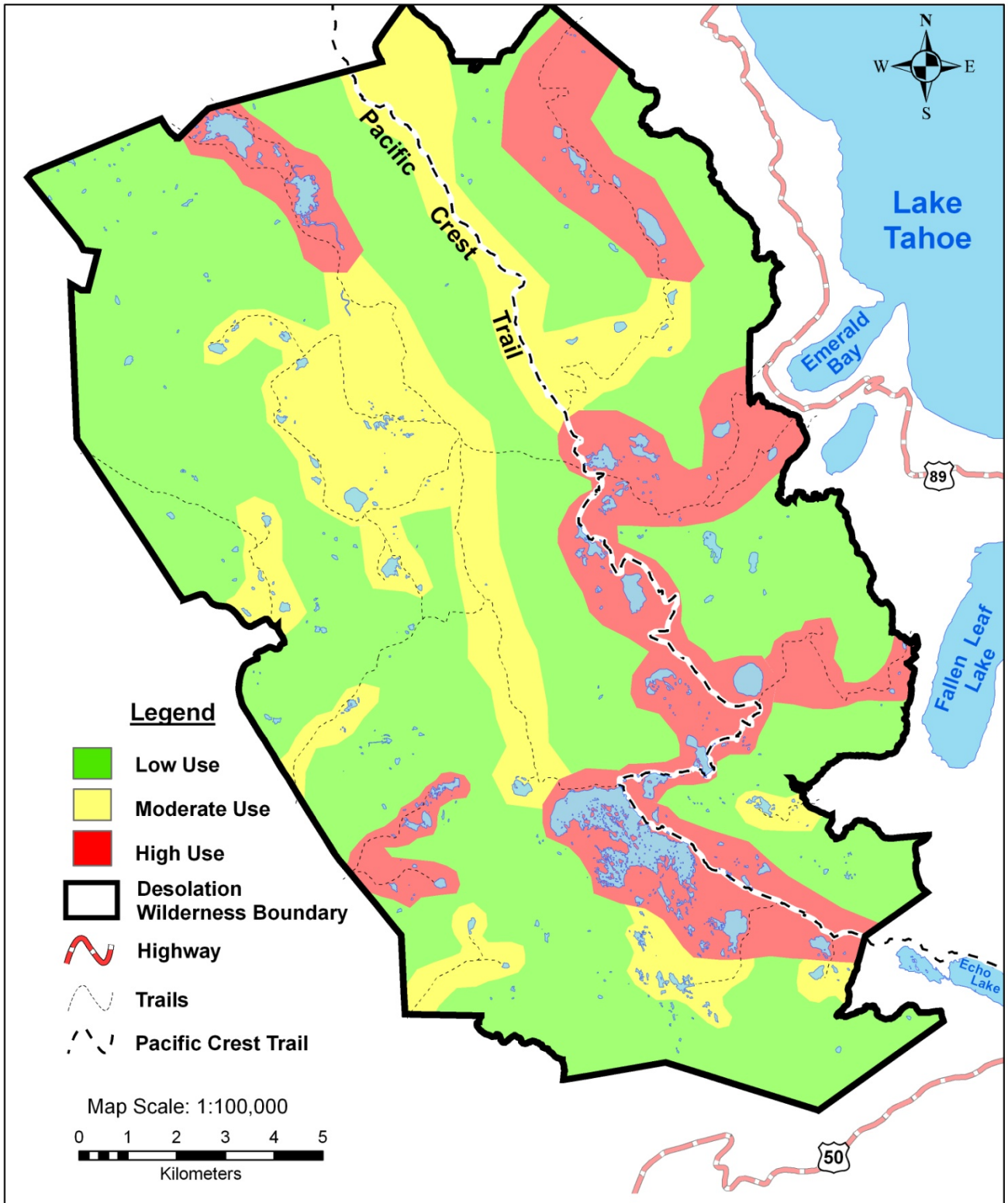

Figure 2: Public Use within the Desolation Wilderness (Muskopf 2009 pers. comm.)

SECTION III

MANAGEMENT DIRECTION



1) ASPEN CREEK PLANNING WATERSHED MANAGEMENT DIRECTION

Aspen Creek PWS is located near Echo Summit and drains into and is bisected by the South Fork American River as well as Highway 50. Two named lakes and 13 unnamed waters are located within the watershed. Most of the waters are accessible from Highway 50 or access roads off of Highway 50. Cup Lake is a popular day use destination for anglers and can be accessed from Highway 50 or the Echo Lake area.

Table 1 provides summary data for amphibian resources and management in the Aspen Creek PWS. Table 2 provides a summary of fish population data for the Aspen Creek PWS. Table 3 provides a summary of fisheries management for the Aspen Creek PWS. Figure 3 provides herpetofauna species distribution for the Aspen Creek PWS. Figure 4 provides the management direction for the Aspen Creek PWS. Figure 5 provides fish species distribution for the Aspen Creek PWS.

Herpetofauna Resources and Management

SNYLF were observed in the vicinity of Cup Lake in 1945 (California Natural Diversity Database; CNDDB). However, CDFG HML survey crews did not detect SNYLF during 2003, 2004, and 2005 surveys in the PWS. AMMA larvae were observed at an unnamed lake (Lake ID 14422.00) in 2005 and this water will be managed as an amphibian resource.

Fisheries Resources and Management

Cup Lake (Photo 1) is a well-known golden trout fishery that can be accessed by a relatively short, but steep hike from the Echo Lake area. Anecdotal reports suggest the lake is popular amongst Echo Lake cabin owners and with anglers who desire a day hike destination in a wilderness setting.

Photo 1: Cup Lake (2008 John Hanson, CDFG)

Brook trout were stocked in Cup Lake from 1951 until 1964 and currently are self-sustaining. In 1964 the allotment was shifted to golden trout which were stocked regularly until 1999. Stocking of golden trout fingerlings resumed in 2007 once baseline fishery and amphibian data were collected and analyzed. However, recent angler reports, validated by CDFG, indicate that Lahontan cutthroat trout (Photo 2) have been introduced into the fishery from an unknown source. CDFG intends to manage the lake as a golden trout fishery and further sampling will be conducted to develop a management strategy and course of action. The additional monitoring and assessment may lead to management or stocking allotment changes.

Photo 2: 7 inch Lahontan cutthroat trout from Cup Lake (2008 John Hanson, CDFG)

Audrian Lake was stocked with rainbow trout from 1969 to 2000. However the lake is shallow, contains poor trout habitat, and is reported to winter kill in some years. Adult HYRE were the only animals detected during an HML survey. Based on the absence of breeding amphibians and lack of suitable trout habitat, the lake will no longer be actively managed by CDFG.

Table 1. Summary of herpetofauna survey data and management for Aspen Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
Audrian Lake	14404.00	13-Sep-04	HYRE	3	0	0	0	0	Not actively managed
Cup Lake	14398.00	18-Jul-03	None						TBA
	14422.00	3-Aug-05	HYRE	0	0	0	1550	0	Amphibian resource
			AMMA	0	0	0	7	0	

Table 2. Summary of fish population data for Aspen Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Audrian Lake	14404.00	13-Sep-04	None					
Cup Lake	14398.00	18-Jul-03 26-Oct-08	BK CT-L	yes unknown	21	281	213	0.934

Table 3. Summary of fisheries management information for Aspen Creek PWS.

Lake Name	Lake ID	First Recorded Stocking	Last Recorded Stocking	Pre-Survey Allotments	Current Proposed Allotment	Management Direction
Audrian Lake	14404.00	1930 - BK 1969 - RT	1968 - BK 2000 - RT	1500 RT ANN	DNP	Not actively managed
Cup Lake	14398.00	1951 - BK 1932 - GT	1964 - BK 2008 - GT	500 GT ANN	500 GT ANN	Stocked Lake

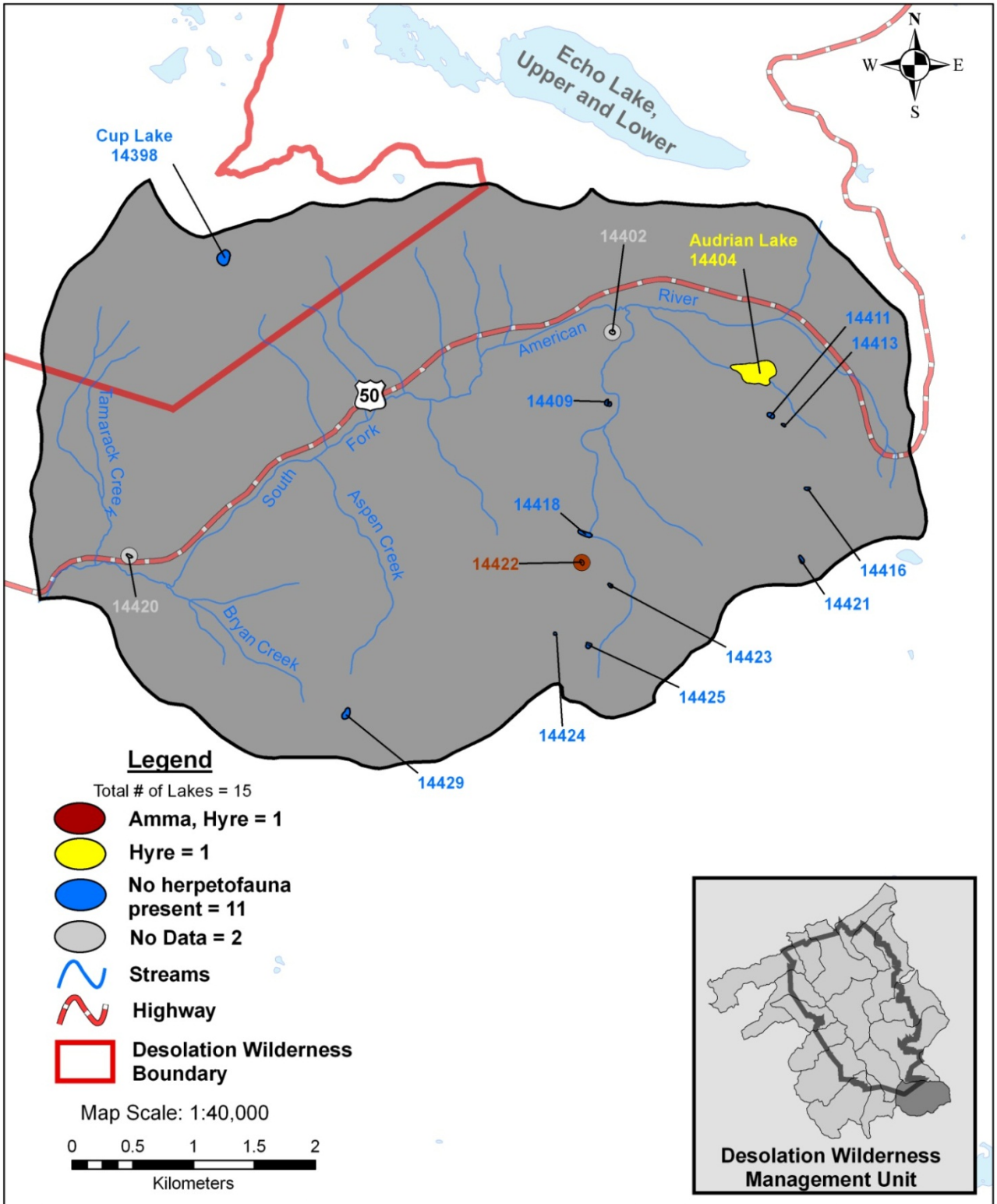

Figure 3: Herpetofauna species distibution in Aspen Creek Planning Watershed during 2003, 2004 and 2005 surveys.

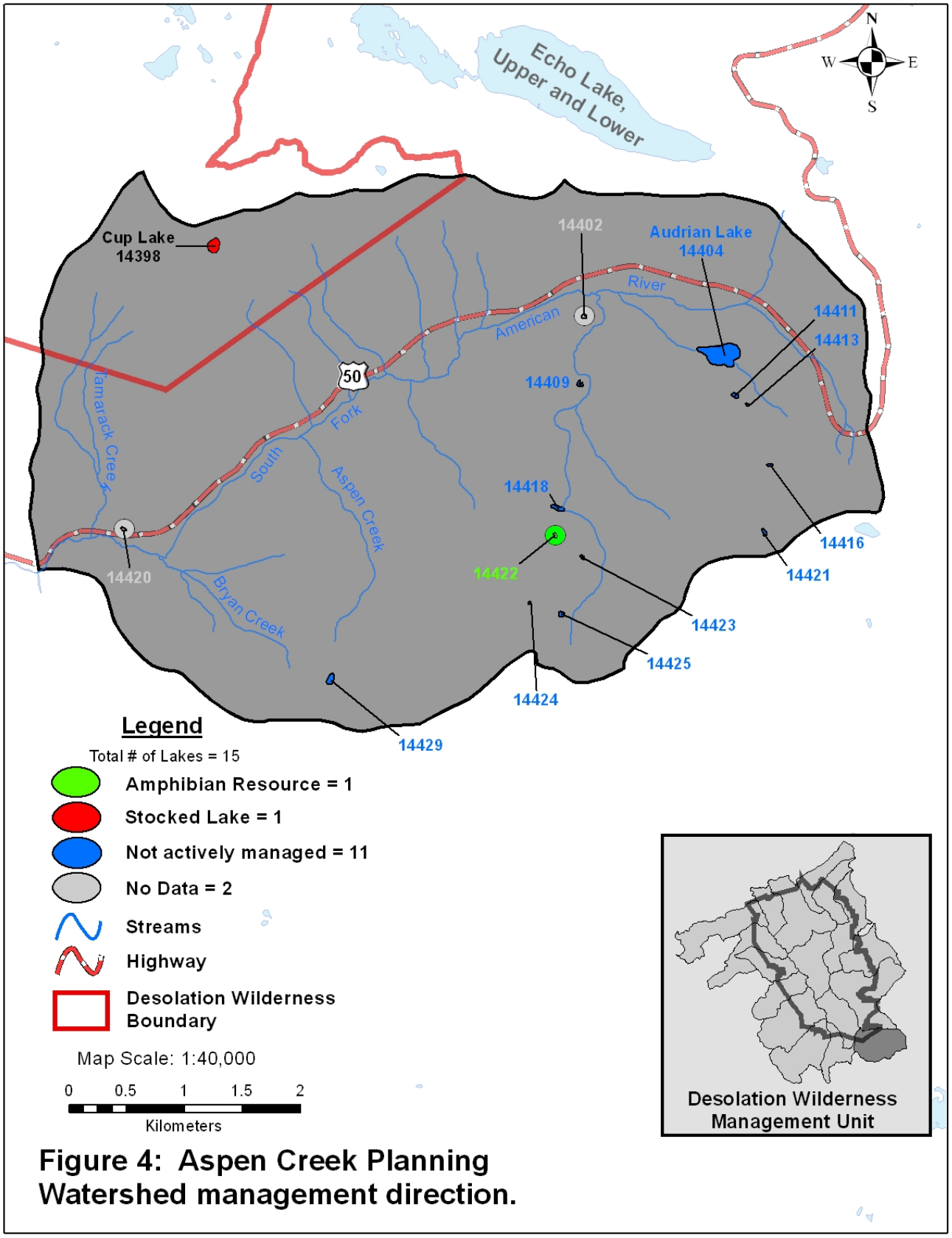

Figure 4: Aspen Creek Planning Watershed management direction.

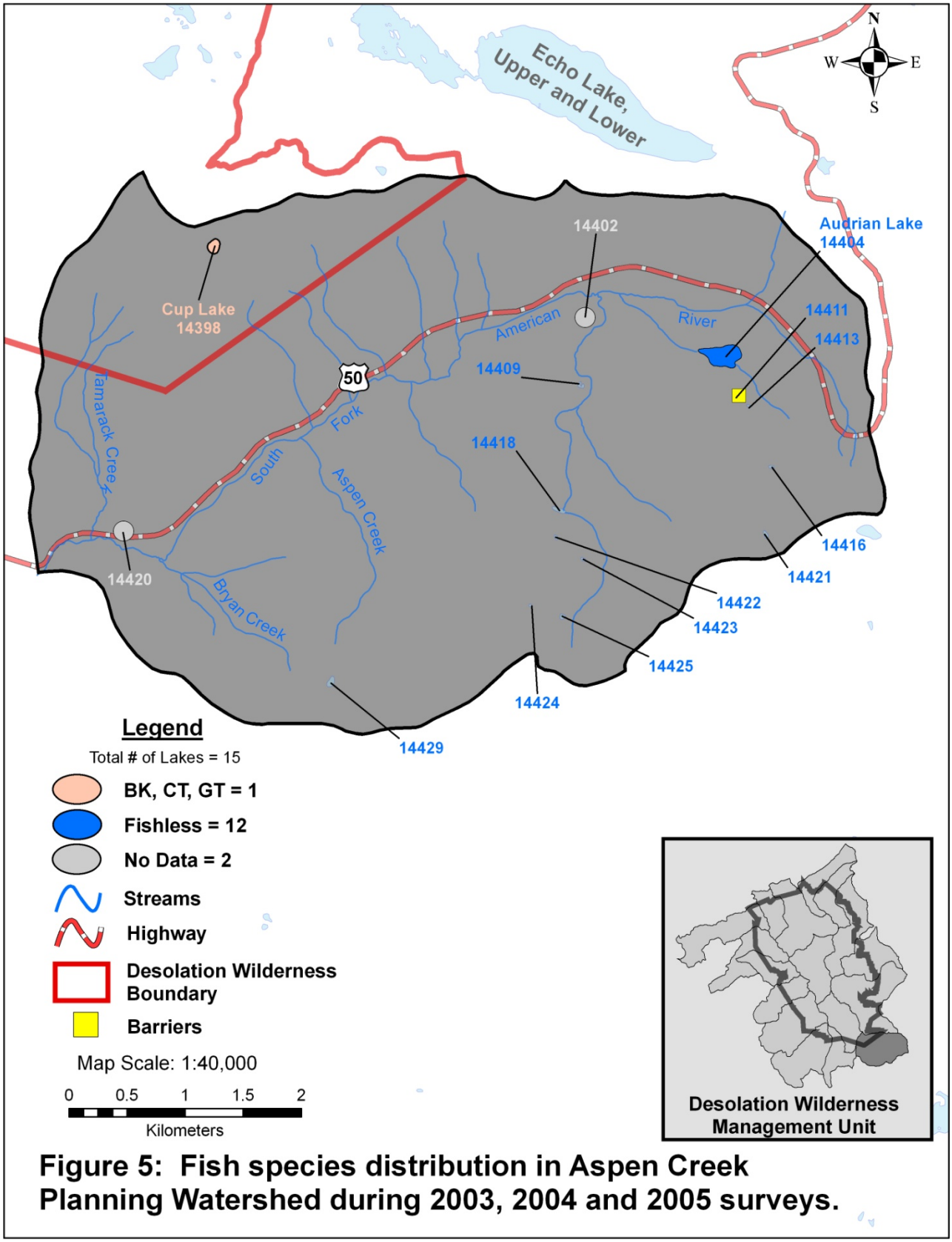

Figure 5: Fish species distribution in Aspen Creek Planning Watershed during 2003, 2004 and 2005 surveys.

2) BASSI FORK SILVER CREEK PLANNING WATERSHED MANAGEMENT DIRECTION

Bassi Fork Silver Creek PWS is part of the South Fork American River watershed and drains into Silver Creek upstream of Union Valley Reservoir. Two named lakes and 10 unnamed waters are found within the watershed boundaries. The area is accessed via dirt roads and jeep trails from Loon Lake and Wrights Lake. Bassi Fork Silver Creek PWS receives less use than other portions of Desolation Wilderness that are easily accessible from paved roads (Fig. 2).

Table 4 provides summary data for amphibian resources and management in the Bassi Fork Silver Creek PWS. Table 5 provides a summary of fish population data for the Bassi Fork Silver Creek PWS. Table 6 provides a summary of fisheries management for the Bassi Fork Silver Creek PWS. Figure 6 provides herpetofauna species distribution for the Bassi Fork Silver Creek PWS. Figure 7 provides the management direction for the Bassi Fork Silver Creek PWS. Figure 8 provides fish species distribution for the Bassi Fork Silver Creek PWS.

Herpetofauna Resources and Management

SNYLF were not observed within Bassi Fork Silver Creek PWS by CDFG during 2002 surveys. However, they were detected along Bassi Fork Silver Creek downstream of Lake ID 14040 in 1992 by Eldorado N.F. and CDFG biologists (CNDDB). No other herpetofauna special-status species have been detected within Bassi Fork Silver Creek PWS.

Fisheries Resources and Management

Number 3 Lake was initially stocked with horse-packed brook trout fingerlings in the 1930s and remained a brook trout fishery for many decades. Brook trout disappeared from the fishery in the late 1950s or early 1960s although the reason why is not well understood. In 1968 CDFG shifted the allotment to golden trout and Number 3 Lake has been successfully managed as a self-sustaining golden trout fishery, supplemented with annual stocking of golden trout fingerlings. CDFG will continue to manage Number 3 Lake as a stocked golden trout fishery.

Forni Lake has a self-sustaining brook trout population established in the 1950s by aerial stocking of fingerlings. Golden trout were stocked in 1968 in an attempt to provide angling diversity but they have not done well in the lake. As a result, Forni Lake will no longer be stocked and it will be managed as a self-sustaining brook trout fishery.

Table 4. Summary of herpetofauna survey data and management for Bassi Fork Silver Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
Forni Lake	13906.00	26-Sep-02	None						Self-sustaining fishery
Number 3 Lake	13987.00	31-Aug-02	HYRE	1	0	0	0	0	Stocked lake
	13897.00	27-Sep-02	HYRE	2	0	0	0	0	Not actively managed
			THEL	1	0	0	0	0	
	13984.00	31-Aug-02	HYRE	0	0	0	2	0	Amphibian resource
			HYRE	0	1	0	0	0	

Table 5. Summary of fish population data for Bassi Fork Silver Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Forni Lake	13906.00	26-Sep-02	BK	yes	19	268	210	0.953
Number 3 Lake	13987.00	31-Aug-02	GT	unknown	12	215	110	1.034

Table 6. Summary of fisheries management information for Bassi Fork Silver Creek PWS.

Lake Name	Lake ID	First Recorded Stocking	Last Recorded Stocking	Pre-Survey Allotments	Current Proposed Allotment	Management Direction
Forni Lake	13906.00	1951 - BK 1968 - GT	1965 - BK 2000 - GT	1000 GT ANN	DNP	Self-sustaining fishery
Number 3 Lake	13987.00	1934 - BK 1968 - GT	1952 - BK 2008 - GT	1000 GT ANN	1000 GT ANN	Stocked lake

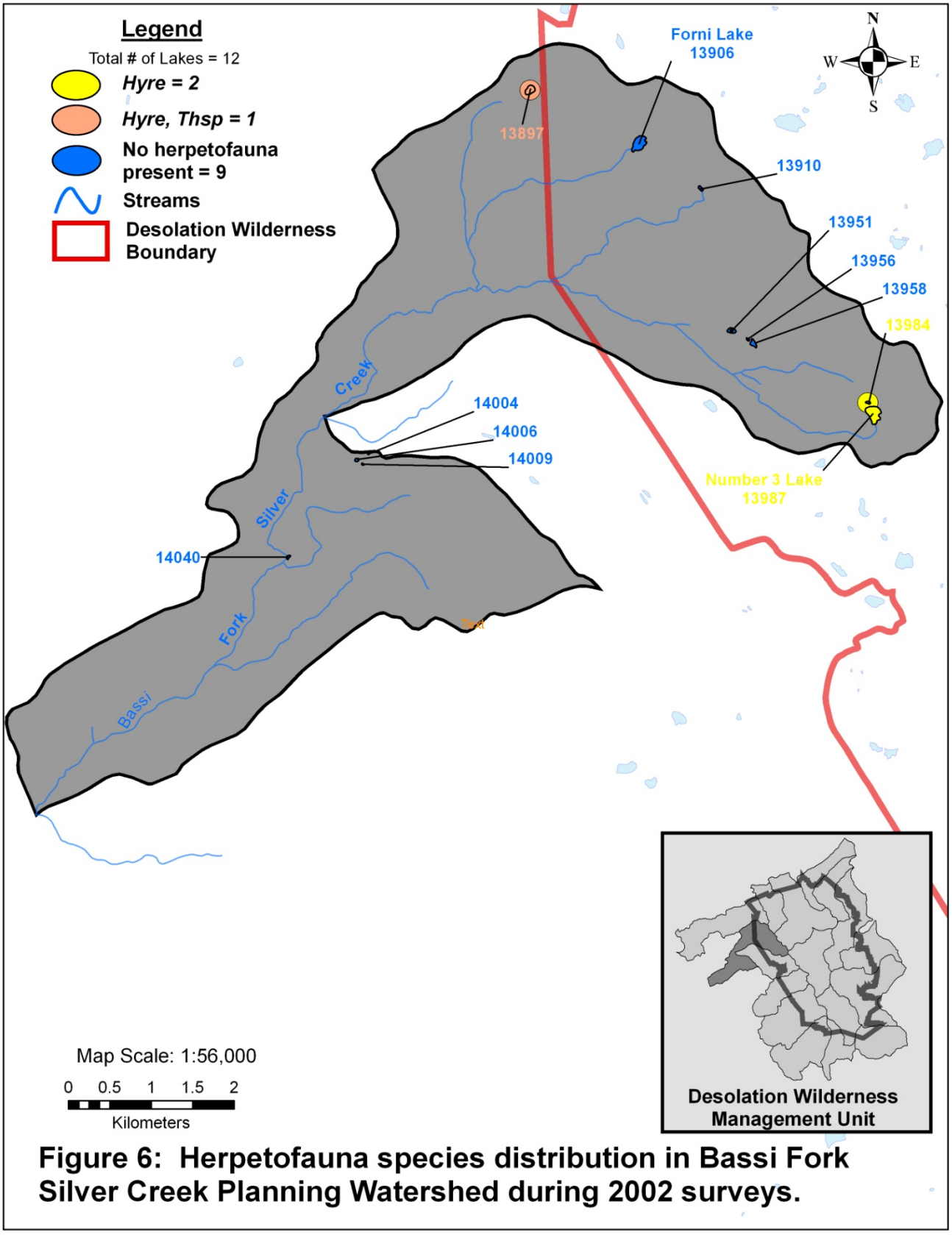

Figure 6: Herpetofauna species distribution in Bassi Fork Silver Creek Planning Watershed during 2002 surveys.

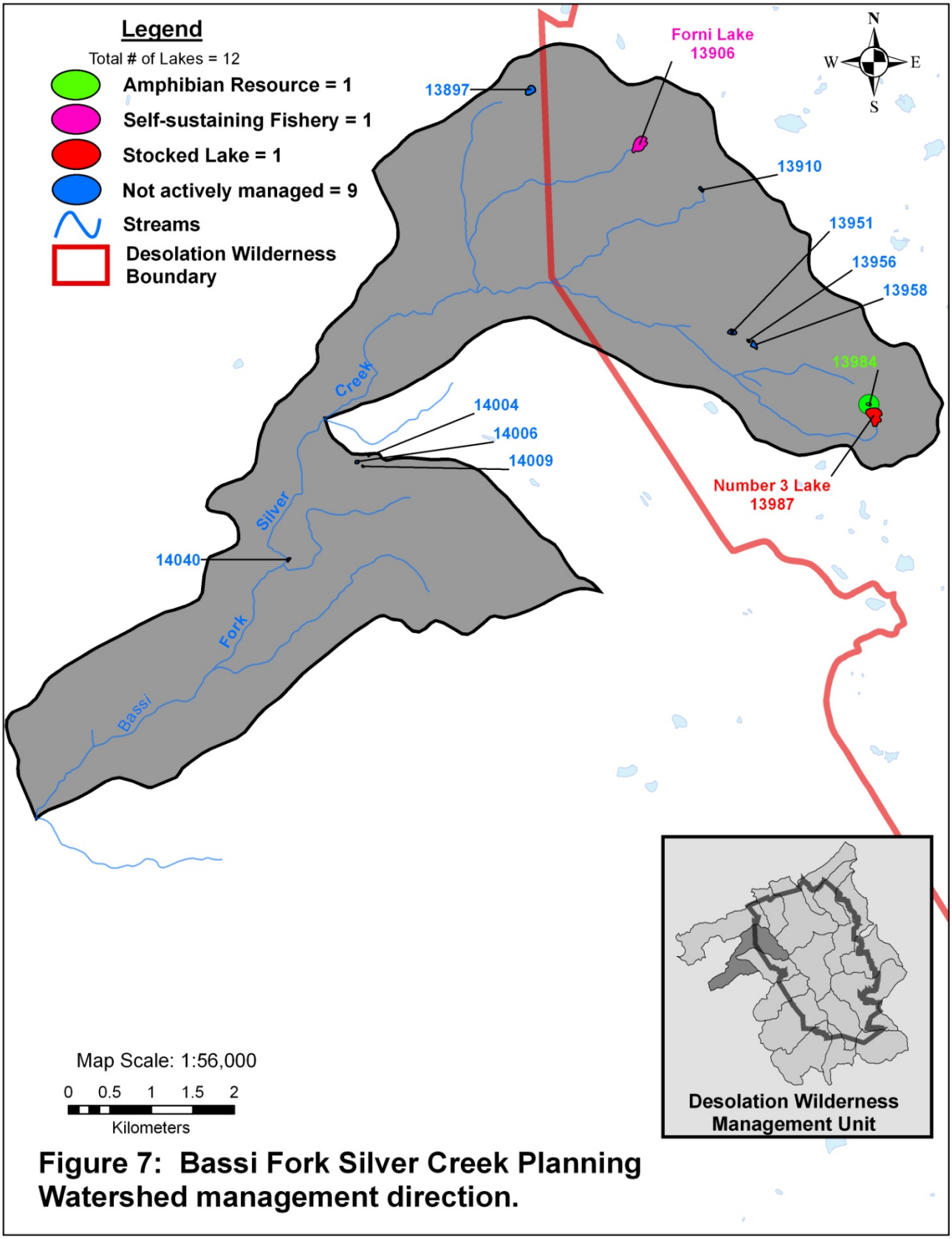

Figure 7: Bassi Fork Silver Creek Planning Watershed management direction.

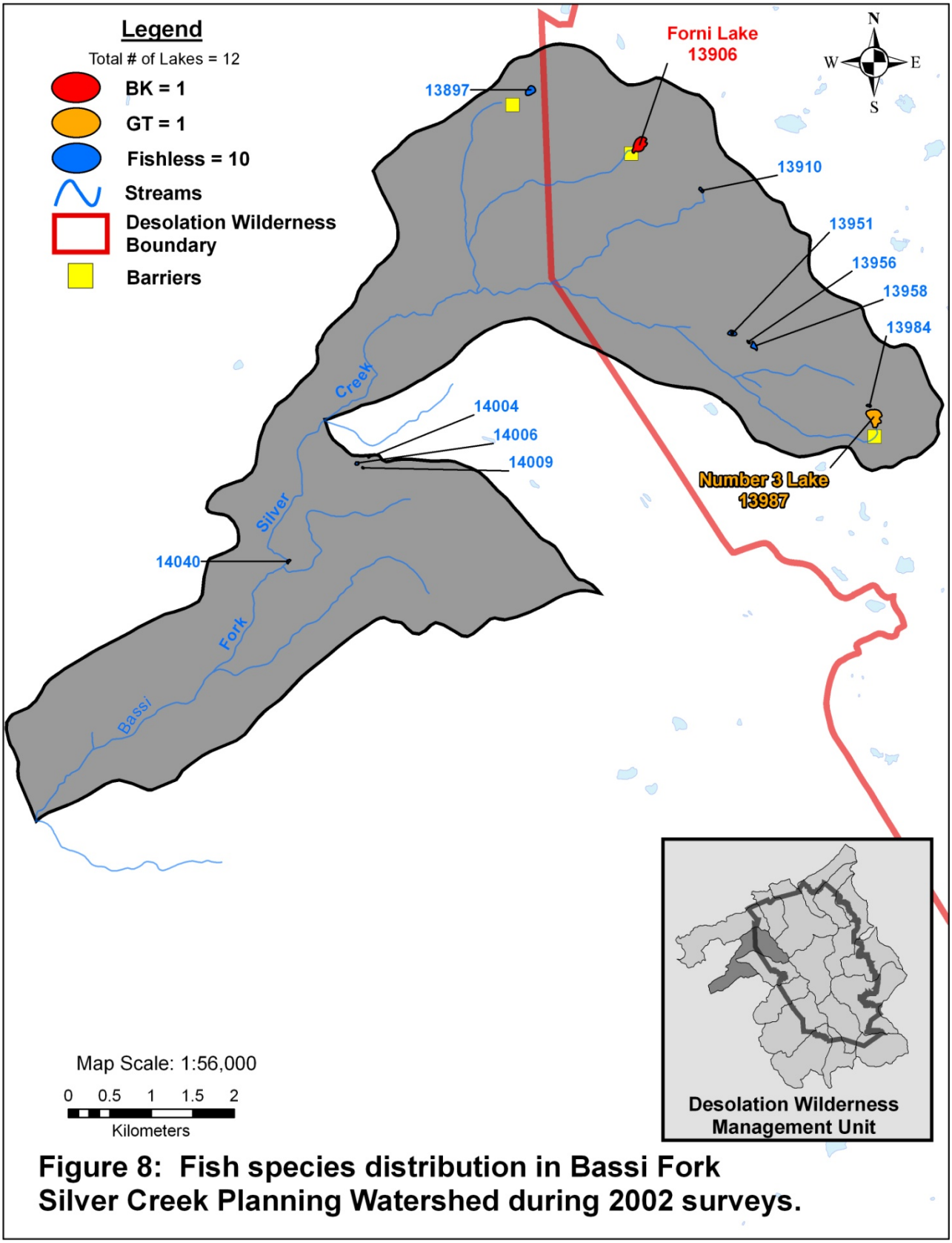

Figure 8: Fish species distribution in Bassi Fork Silver Creek Planning Watershed during 2002 surveys.

3) CASCADE CREEK PLANNING WATERSHED MANAGEMENT DIRECTION

Cascade Creek PWS includes Cascade Creek, Tallac Creek and Taylor Creek below Fallen Leaf Lake, all of which drain to the Lake Tahoe basin. Seven named lakes and 13 unnamed waters are found within the PWS. Cascade Lake is one of the seven named lakes, but it is not managed by the HML project and therefore not addressed in this plan. Taylor Creek is a CDFG brood stock source for Kokanee salmon, and the creek is not managed by the HML project.

The lakes within this PWS are accessed by steep trails from Highway 89 near Emerald Bay. Although Granite Lake is the only water directly accessible by trail, most of the waters in the PWS are day hike accessible by utilizing a combination of trails and cross country routes. The lakes nearest the Pacific Crest Trail and the Eagle Lake trail receive heavy day use by hikers and anglers.

Table 7 provides summary data for amphibian resources and management in the Cascade Creek PWS. Table 8 provides a summary of fish population data for the Cascade Creek PWS. Table 9 provides a summary of fisheries management for the Cascade Creek PWS. Figure 9 provides herpetofauna species distribution for the Cascade Creek PWS. Figure 10 provides the management direction for the Cascade Creek PWS. Figure 11 provides fish species distribution for the Cascade Creek PWS.

Herpetofauna Resources and Management

SNYLF were not detected during CDFG surveys in 2003 and 2005 and there are no known historic observations within this PWS (CNDDB). AMMA larvae were detected at Lake ID's 13976, 13986, and 13996.04. All three sites where AMMA were detected will be managed as amphibian resources.

Fisheries Resources and Management

Azure Lake (Photo 3) was stocked with brook trout for many decades. Stocking was ceased in 1979 but the brook trout population is self-sustaining and was still present when sampled by CDFG in 2003. Similarly, stocking of brook trout at Snow Lake ceased in 1994 but fishery data indicates that brook trout and brown trout persist in the lake. Azure and Snow lakes will continue to be managed as self-sustaining fisheries.

Photo 3: Azure Lake looking north (2003 CDFG)

Floating Island Lake was stocked with brook trout from 1932 to 2000 and grows large fish that forage on the populations of speckled dace and Lahontan redside. This successful fishery will continue to be stocked with a small supplemental allotment of Lahontan cutthroat trout. A single adult golden trout was found during a 2003 gill net survey. It is unknown whether this is an anomalous finding or an indication of persistent golden trout presence within the fishery. Fish barriers are present in the outlet stream approximately 50 m (160 feet) downstream from the lake preventing upstream movement into the lake. The presence of barriers indicates that the single golden trout was probably the result of an unknown stocking event.

Granite Lake has been stocked with brook trout since the 1930s and was last stocked in 2000. However, CDFG caught only a single brook trout during sampling efforts in 2003. Due to limited spawning habitat, the brook trout have likely disappeared in the absence of stocking. Additional monitoring efforts are necessary to determine if the lake is fishless. The lake could serve as a put-and-grow trophy trout fishery. However, due to USFS wilderness management objectives, CDFG will no longer actively manage Granite Lake and the lake will remain fishless.

Kalmia Lake and Tallac Lake are both small, remote lakes that have been stocked with golden trout since the 1960s. Angler reports and CDFG gill net data show that the lakes produce healthy golden trout. The lakes are most likely dependent upon regular stocking to sustain functional fisheries and will continue to be stocked; however stocking will be changed to Lahontan cutthroat trout in order to meet CDFG and USFS wilderness management objectives.

Table 7. Summary of herpetofauna survey data and management for Cascade Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
Azure Lake	13996.00	13-Aug-03	None						Self-sustaining fishery
Floating Island Lake	14055.00	31-Jul-03	THEL	3	0	0	0	0	Stocked lake
Granite Lake	13943.00	31-Jul-03	None						Not actively managed
Kalmia Lake	14035.00	13-Aug-03	None						Stocked lake
Snow Lake	14011.00	13-Aug-03	None						Self-sustaining fishery
Tallac Lake	14032.00	13-Aug-03	HYRE	0	0	0	500	0	Stocked lake
	13975.00	14-Aug-03	THEL	0	1	0	0	0	Not actively managed
	13975.01	14-Aug-03	HYRE	0	7	0	0	0	Not actively managed
			THEL	2	0	0	0	0	
	13975.02	14-Aug-03	THEL	2	1	0	0	0	Not actively managed
	13976.00	14-Aug-03	AMMA	0	0	0	320	0	Amphibian resource
			HYRE	0	0	800	200	0	
	13986.00	14-Aug-03	AMMA	0	0	0	40	0	Amphibian resource
			HYRE	0	0	35	40	0	
	13996.02	1-Aug-03	HYRE	0	0	0	18	0	Amphibian resource
	13996.03	1-Aug-03	HYRE	0	0	0	17	0	Amphibian resource
	13996.04	1-Aug-03	HYRE	0	0	0	530	0	Amphibian resource
			AMMA	0	0	0	130	0	
	13996.05	1-Aug-03	HYRE	0	0	0	1300	0	Amphibian resource
	14002.00	14-Aug-03	HYRE	0	4	1	0	0	Not actively managed
	14045.00	31-Jul-03	HYRE	0	225	8	2	0	Amphibian resource
			THEL	3	0	0	0	0	

Table 8. Summary of fish population data for Cascade Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Azure Lake	13996.00	13-Aug-03	BK	yes	26	242	164	1.063
Floating Island Lake	14055.00	31-Jul-03	BK	yes	2	289	295	1.198
			DC	yes	20	97	9	0.915
			GT	yes	1	267	200	1.051
			LRS	yes	22	120	16	0.876
Granite Lake	13943.00	31-Jul-03	BK	no	1	295	390	1.519
			DC	yes	20	89	7	0.977

Table 8, Con't. Summary of fish population data for Cascade Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Kalmia Lake	14035.00	13-Aug-03	GT	unknown	6	196	185	0.841
Snow Lake	14011.00	13-Aug-03	BK	yes	10	222	108	0.918
			BN	yes	15	122	21	1.102
Tallac Lake	14032.00	13-Aug-03	GT	unknown	10	226	132	1.021

Table 9. Summary of fisheries management information for Cascade Creek PWS.

Lake Name	Lake ID	First Recorded Stocking	Last Recorded Stocking	Pre-Survey Allotments	Current Proposed Allotment	Management Direction
Azure Lake	13996.00	1935 - BK	1979 - BK	DNP	DNP	Self-sustaining fishery
Floating Island Lake	14055.00	1932 - BK	2000 - BK	250 BK ANN	250 CT-L ANN	Stocked lake
Granite Lake	13943.00	1934 - BK	2000 - BK	1000 BK ANN	DNP	Not actively managed
Kalmia Lake	14035.00	1935 - BK 1965 - GT	1949 - BK 2004 - GT	500 GT ANN	500 CTL ANN	Stocked lake
Snow Lake	14011.00	1935 - BK	1994 - BK	DNP	DNP	Self-sustaining fishery
Tallac Lake	14032.00	1968 - GT	2000 - GT	250 GT ANN	250 CTL ANN	Stocked lake

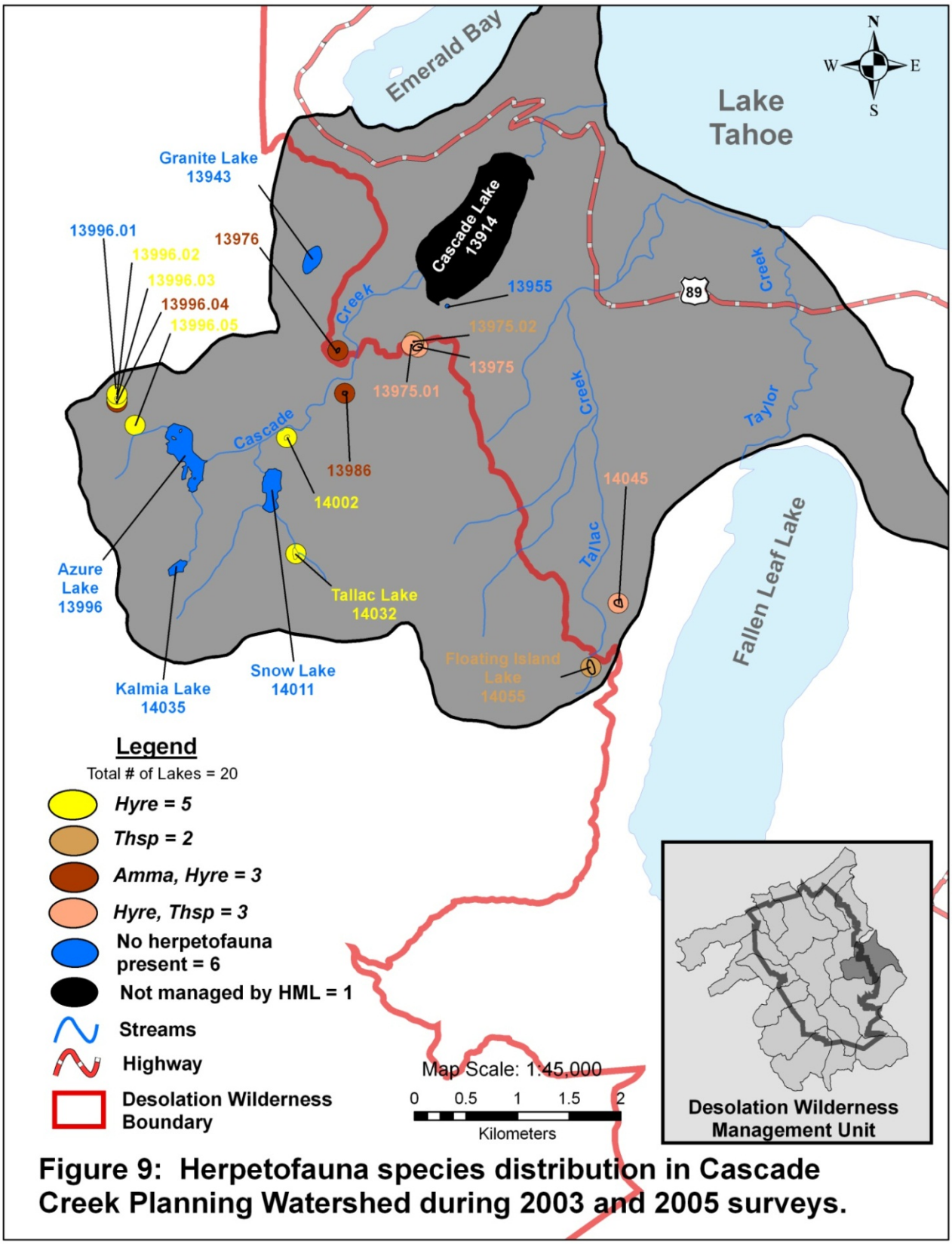

Figure 9: Herpetofauna species distribution in Cascade Creek Planning Watershed during 2003 and 2005 surveys.

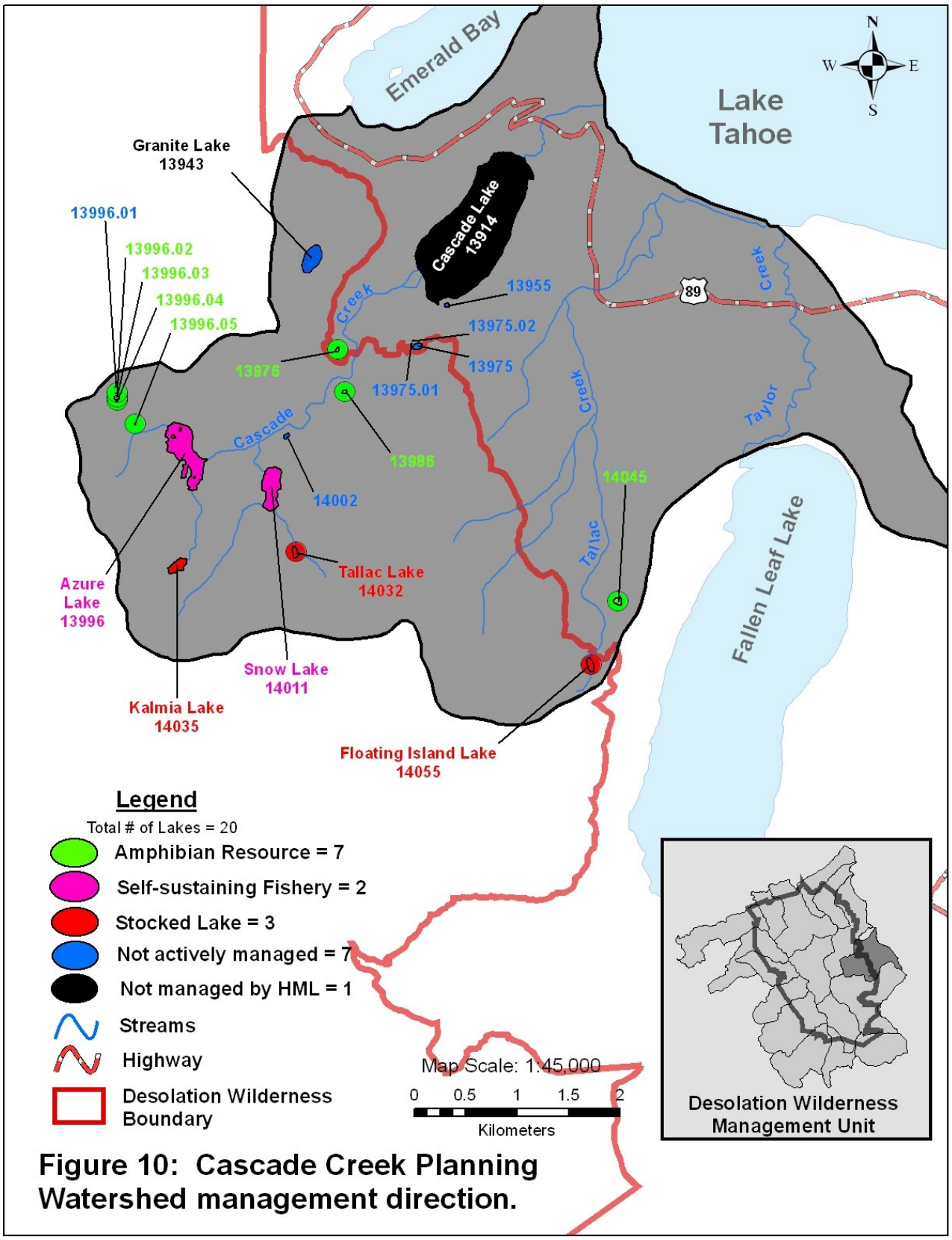

Figure 10: Cascade Creek Planning Watershed management direction.

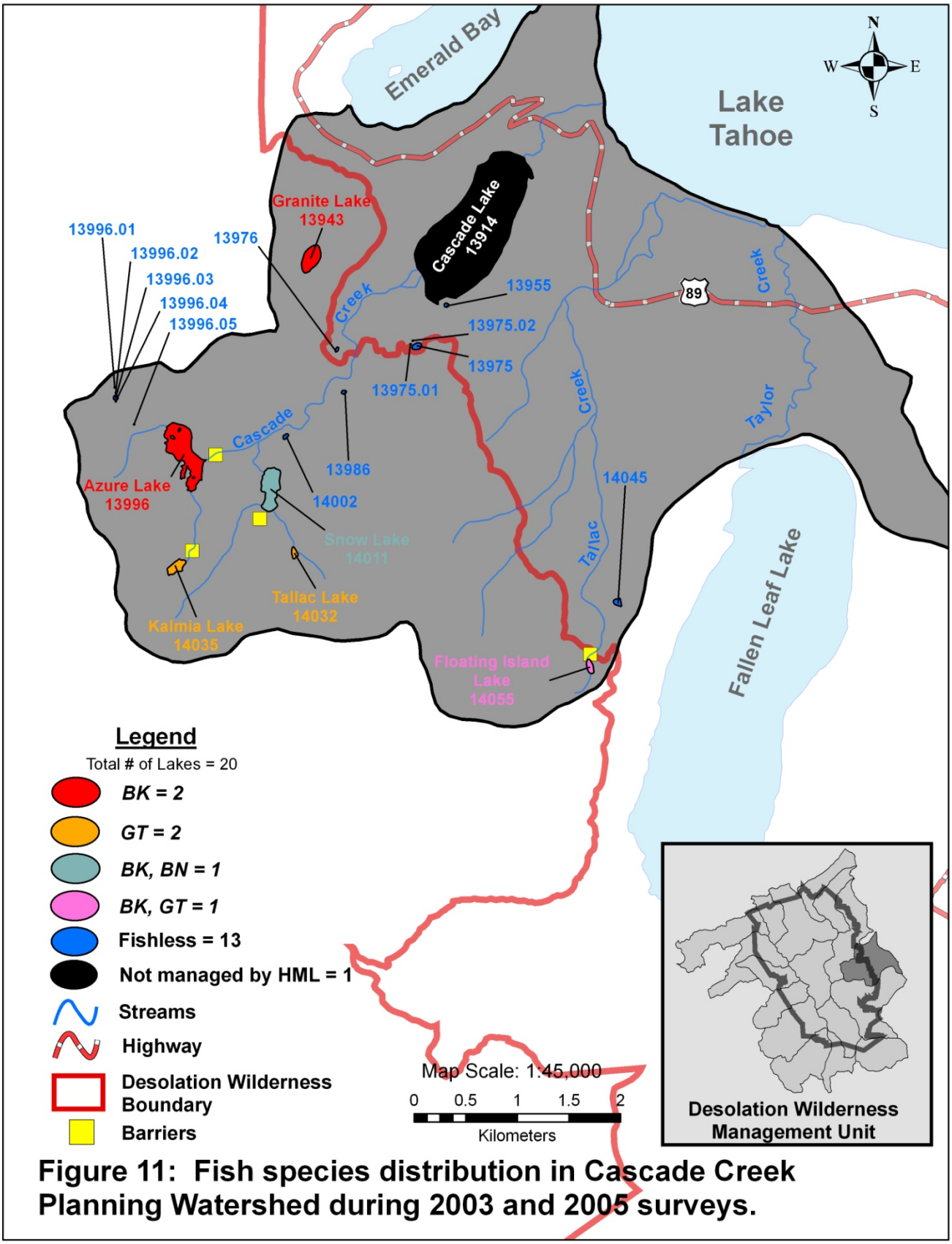

Figure 11: Fish species distribution in Cascade Creek Planning Watershed during 2003 and 2005 surveys.

4) FORNI CREEK PLANNING WATERSHED MANAGEMENT DIRECTION

Forni Creek PWS consists of three small creek systems that drain into the South Fork American River. One named lake and six unnamed waters are located within the PWS.

Table 10 provides summary data for amphibian resources and management in the Forni Creek PWS. Table 11 provides a summary of fish population data for the Forni Creek PWS. Table 12 provides a summary of fisheries management for the Forni Creek PWS. Figure 12 provides herpetofauna species distribution for the Forni Creek PWS. Figure 13 provides the management direction for the Forni Creek PWS. Figure 14 provides fish species distribution for the Forni Creek PWS.

Herpetofauna Resources and Management

A CDFG biologist surveyed Forni Lake in 1951 and reported “frogs and tadpoles were seen and were quite common” but the species was not identified. CNDDB lists a SNYLF observation at Forni Lake in 1994. CDFG detected small numbers of SNYLF during surveys in 2004 and 2005, but monitoring surveys in 2008 found only HYRE. The status of the population is currently unknown but the lake will continue to be monitored to determine if SNYLF have been extirpated. Forni Lake is a HYRE breeding location and will be managed as an amphibian resource.

Fisheries Resources and Management

There are no fisheries resources managed by the HML project within the Forni Creek PWS. Forni Lake is likely too shallow to support fish and CDFG has no record of it ever being stocked. Based on the management of Forni Lake as an amphibian resource it will not be stocked in the future.

Table 10. Summary of herpetofauna survey data and management for Forni Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
Forni Lake	14414.00	10-Sep-04	THEL	1	0	0	0	0	Amphibian resource
		7-Sep-05	SNYLF	1	0	0	0	0	
		19-Jul-08	HYRE	0	0	1	31	0	
		19-Jul-08	THSI	1	1	0	0	0	
	14349.00	27-Aug-04	HYRE	1	0	0	0	0	Not actively managed
	14393.00	28-Aug-04	HYRE	0	0	2	0	0	Not actively managed

Table 11. Summary of fish population data for Forni Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Forni Lake	14414.00	10-Sep-04	None					

Table 12. Summary of fisheries management information for Forni Creek PWS.

Lake Name	Lake ID	First Recorded Stocking	Last Recorded Stocking	Pre-Survey Allotments	Current Proposed Allotment	Management Direction
Forni Lake	14414.00			DNP	DNP	Amphibian resource

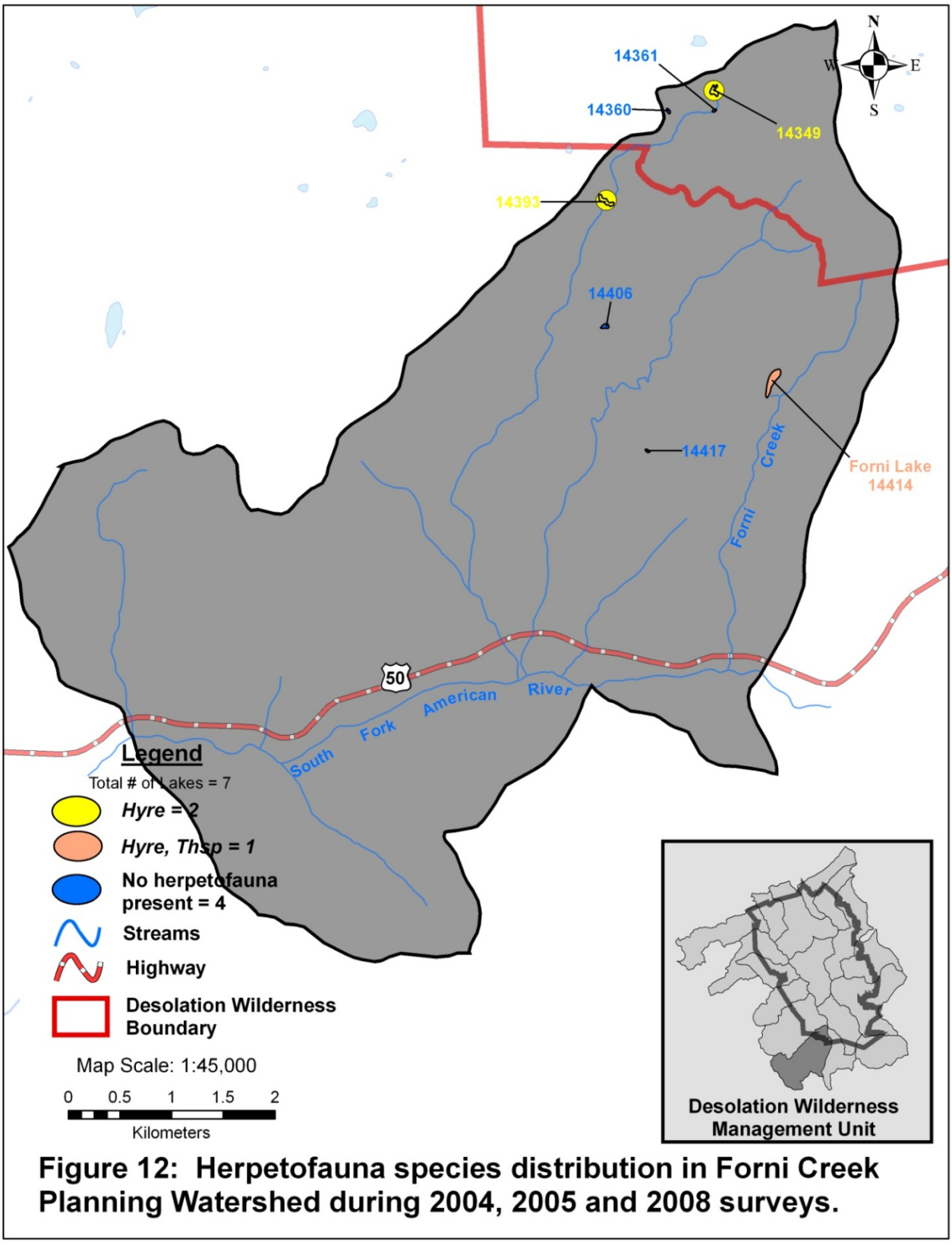

Figure 12: Herpetofauna species distribution in Forni Creek Planning Watershed during 2004, 2005 and 2008 surveys.

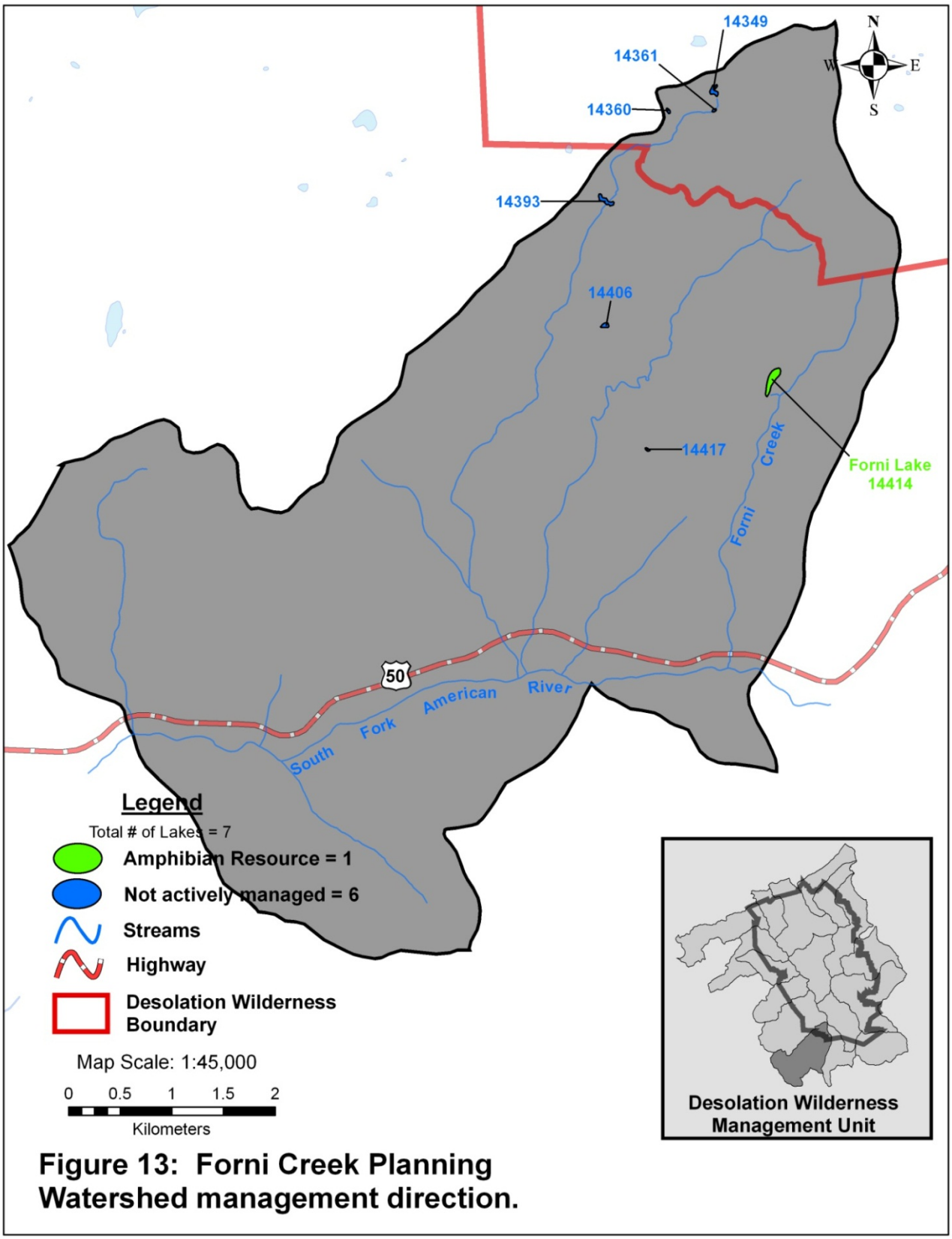

Figure 13: Forni Creek Planning Watershed management direction.

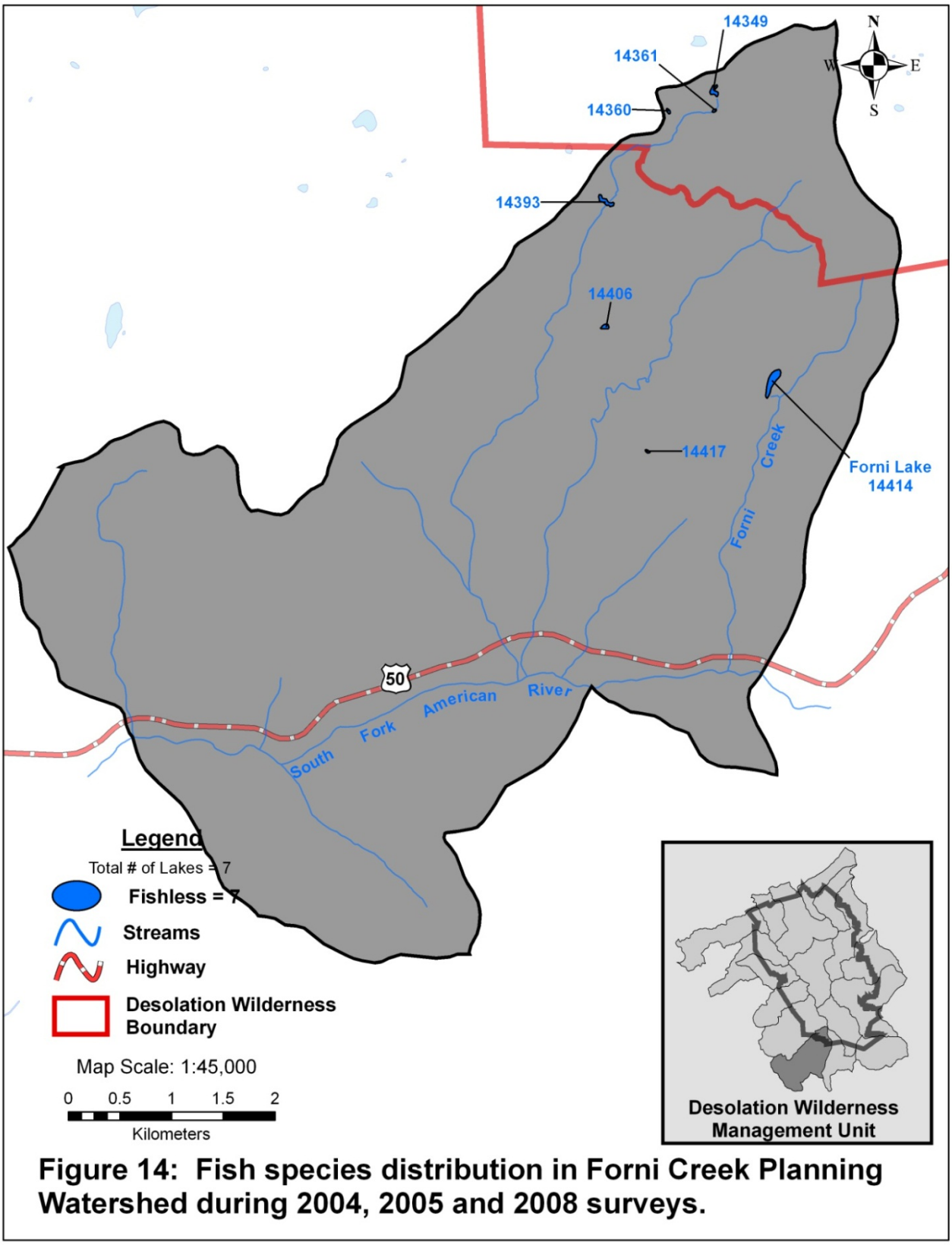

Figure 14: Fish species distribution in Forni Creek Planning Watershed during 2004, 2005 and 2008 surveys.

5) GENERAL CREEK PLANNING WATERSHED MANAGEMENT DIRECTION

General Creek PWS encompasses the entire watershed of General Creek which drains to Lake Tahoe north of Meeks Bay. Two named lakes and five unnamed waters are located within the PWS.

Table 13 provides summary data for amphibian resources and management in the General Creek PWS. Table 14 provides a summary of fish population data for the General Creek PWS. Table 15 provides a summary of fisheries management for the General Creek PWS. Figure 15 provides herpetofauna species distribution for the General Creek PWS. Figure 16 provides the management direction for the General Creek PWS. Figure 17 provides fish species distribution for the General Creek PWS.

Herpetofauna Resources and Management

SNYLF were not detected by CDFG during 2003 surveys and there are no known historic occurrences within the PWS. A single BUBO sub-adult was observed at Lake ID 13746 but other sources suggest the species is widely distributed throughout the watershed (Davidson 1998). AMMA were detected at Lake ID 13720 (Davidson 1998) but the species was not observed by CDFG crews during 2003 surveys. Both lakes will be managed as amphibian resources.

Duck Lake is shallow, fishless and supports a burgeoning population of HYRE. Although not detected during CDFG surveys it is likely that the lake is utilized by AMMA that are known to exist within the watershed. As a result Duck Lake will be managed as an amphibian resource.

Fisheries Resources and Management

Lost Lake has been stocked with several species of trout (brook trout, rainbow trout, and golden trout) over the course of its 60 year stocking history. Most recently Lost Lake was managed as a put-and-grow rainbow trout fishery that produced large, robust fish. The lake is not self-sustaining and due to cessation of stocking in 2000 it is likely fishless. Additional monitoring is necessary to determine if the lake is fishless. Due to USFS wilderness management objectives, CDFG will no longer actively manage Lost Lake and it will remain fishless.

Duck Lake is very shallow and is not suitable as trout habitat. CDFG has no record of it ever being stocked. Based upon the lake management described above it will be designated for amphibian resources and it will not be stocked in the future.

Table 13. Summary of herpetofauna survey data and management for General Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
Duck Lake	13763.00	3-Aug-03	HYRE	0	0	65	2	0	Amphibian resource
			THEL	2	0	0	0	0	
			THSI	4	0	0	0	0	
Lost Lake	13753.00	2-Aug-03	None						Not actively managed
	13720.00	3-Aug-03	HYRE	0	0	330	28	0	Amphibian resource
			THEL	7	0	0	0	0	
	13746.00	3-Aug-03	BUBO	0	1	0	0	0	Amphibian resource
			HYRE	0	0	410	0	0	
			THEL	1	0	0	0	0	
	13758.00	3-Aug-03	HYRE	0	0	52	268	0	Amphibian resource
	13829.00	19-Jul-03	HYRE	0	0	0	67	0	Amphibian resource
	13834.00	19-Jul-03	HYRE	0	0	0	120	0	Amphibian resource
			THEL	0	2	0	0	0	
			THSI	0	1	0	0	0	

Table 14. Summary of fish population data for General Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Duck Lake	13763.00	3-Aug-03	None					
Lost Lake	13753.00	2-Aug-03	RT	no	5	355	400	0.889

Table 15. Summary of fisheries management information for General Creek PWS.

Lake Name	Lake ID	First Recorded Stocking	Last Recorded Stocking	Pre-Survey Allotments	Current Proposed Allotment	Management Direction
Duck Lake	13763.00			DNP	DNP	Amphibian resource
Lost Lake	13753.00	1941 - BK 1967 - RT	1995 - BK 2000 - RT	2000 RT ANN	DNP	Not actively managed

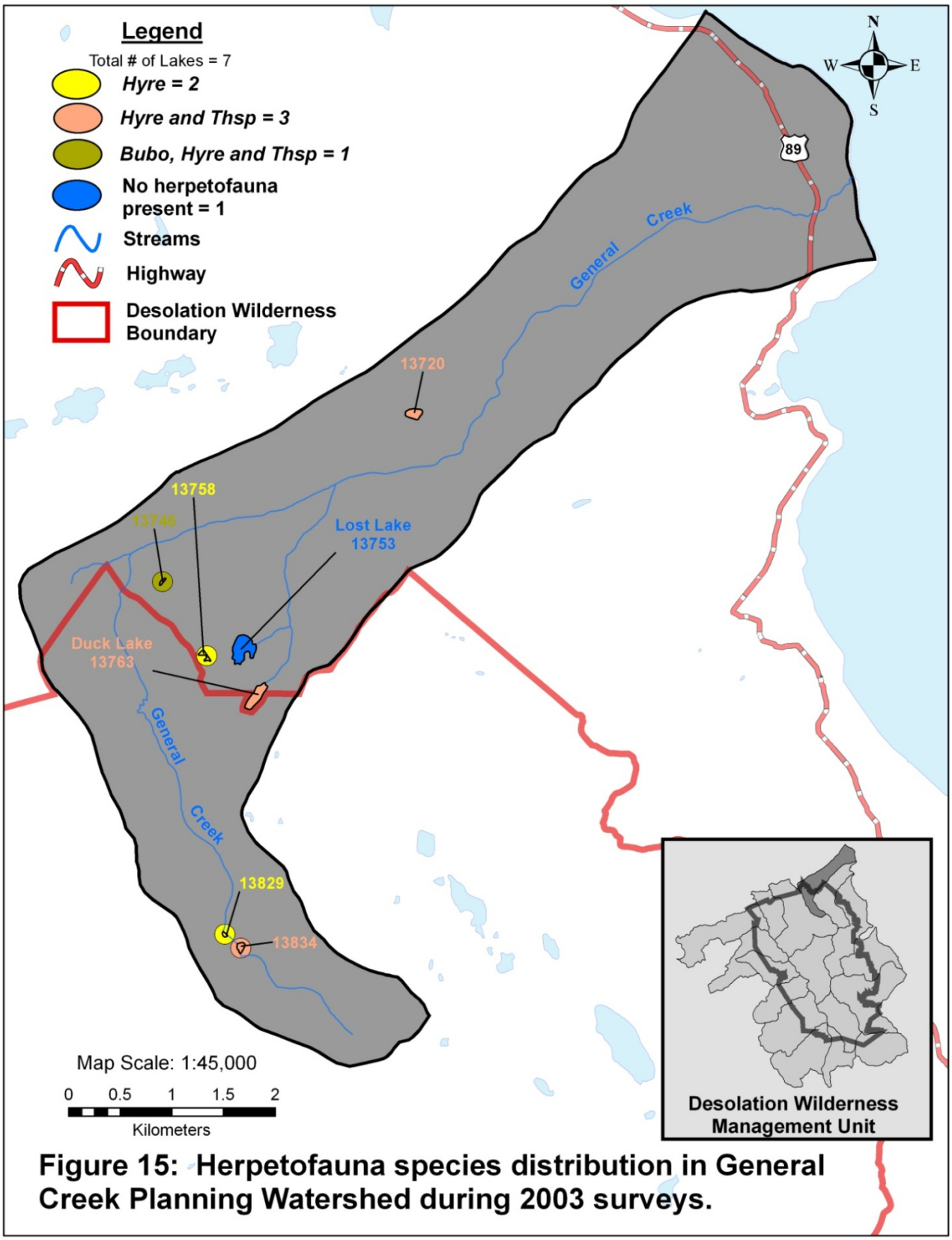

Figure 15: Herpetofauna species distribution in General Creek Planning Watershed during 2003 surveys.

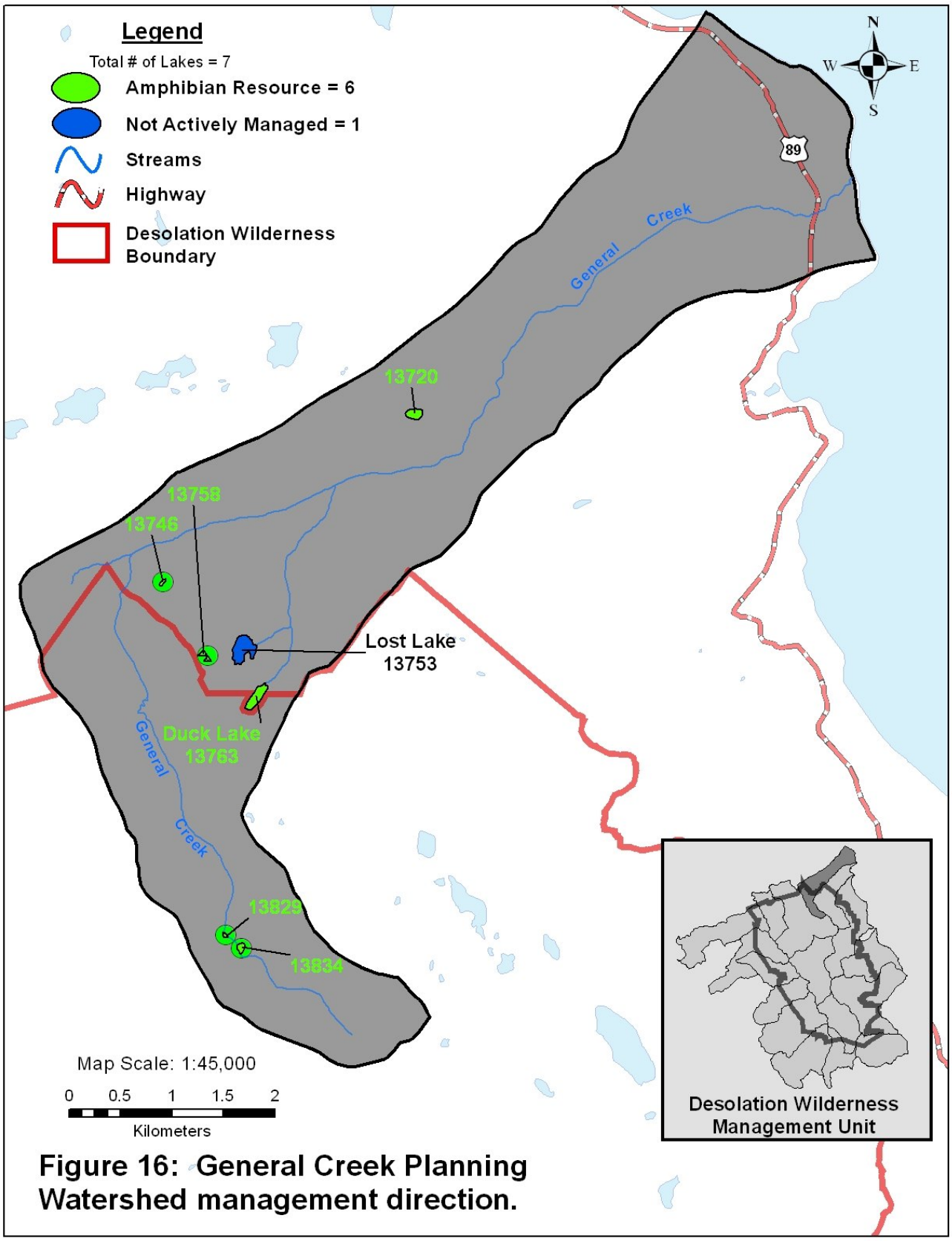

Figure 16: General Creek Planning Watershed management direction.

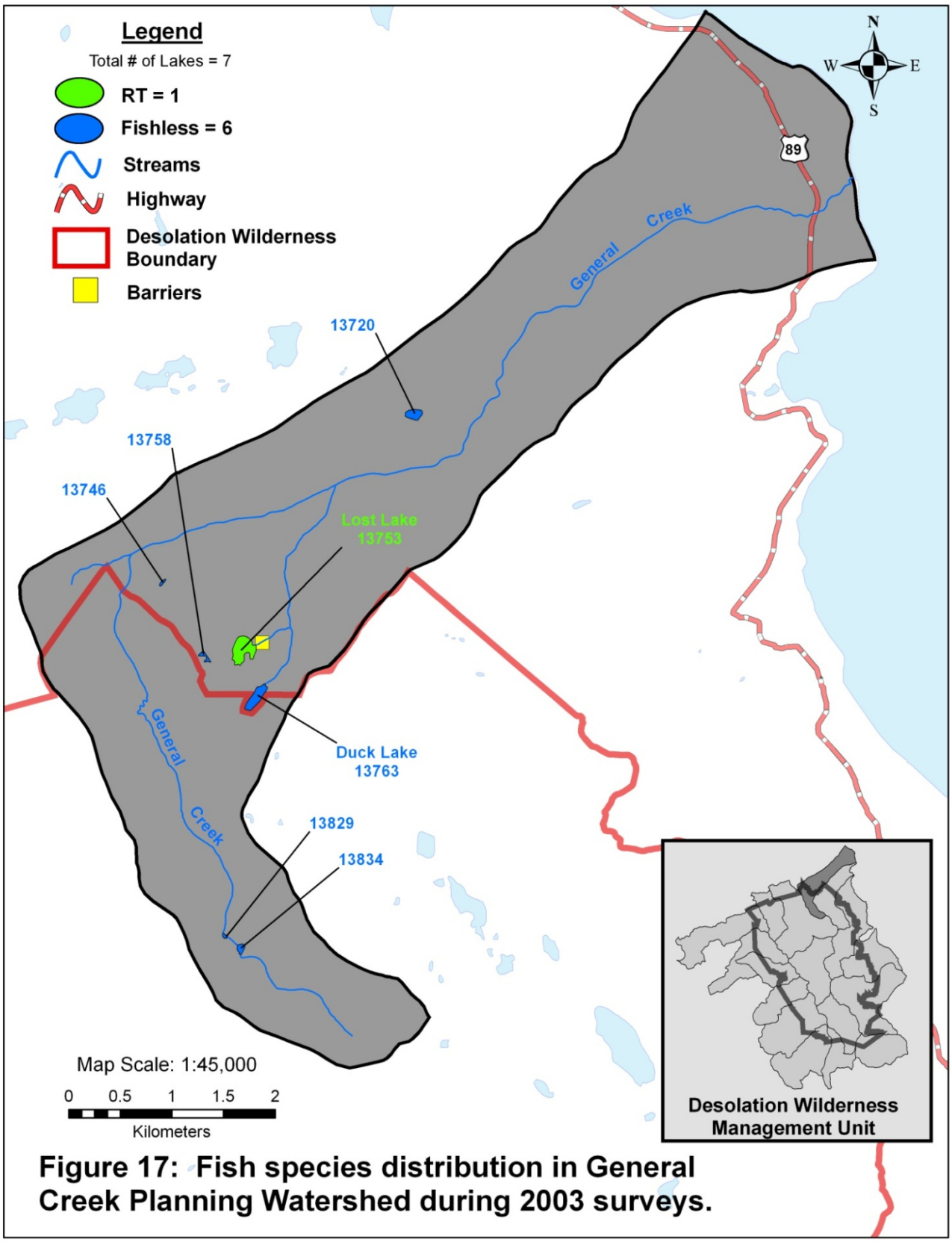

Figure 17: Fish species distribution in General Creek Planning Watershed during 2003 surveys.

6) GLEN ALPINE CREEK PLANNING WATERSHED MANAGEMENT DIRECTION

Functionally, Glen Alpine Creek PWS is divided into two watersheds. The Glen Alpine Creek watershed drains into Lake Tahoe via Fallen Leaf Lake and it is accessed via the Glen Alpine Trail. The Echo Lake watershed flows into the upper Truckee River and is accessed via the Pacific Crest Trail and the Echo Chalet water taxi.

El Dorado Irrigation District (EID) operates a diversion at the Echo lakes dam which delivers water out of the watershed to the South Fork American River near Echo Summit. The diversion of water from Echo lakes is operated under a Federal Energy Regulatory Commission (FERC) license for project number 184 and is governed by the conditions of the license.

Twenty-one named lakes and 105 unnamed waters are located within the PWS. Fallen Leaf Lake, Echo Lakes and Lily Lake are not managed by the HML project and are not addressed in this plan. Similarly, Lake ID's 14118 and 14074 are only accessible through private property and are not managed by CDFG.

Table 16 provides summary data for amphibian resources and management in the Glen Alpine Creek PWS. Table 17 provides a summary of fish population data for the Glen Alpine Creek PWS. Table 18 provides a summary of fisheries management for the Glen Alpine Creek PWS. Figures 18 and 19 provide herpetofauna species distribution for the Glen Alpine Creek PWS. Figures 20 and 21 provide the management direction for the Glen Alpine Creek PWS. Figures 22 and 23 provide fish species distribution for the Glen Alpine Creek PWS.

Herpetofauna Resources and Management

SNYLF have been detected within the Glen Alpine PWS by CDFG and USFS biologists at Cagwin Lake (Photo 4), Lake ID 14334 and the intervening stream reach. Lake ID 14334 is the only known SNYLF breeding location east of the pacific crest within Desolation Wilderness. Anecdotal reports from the 1930s and 1940s (USDA Forest Service 2008) and museum specimens collected from Fallen Leaf Lake in 1925 suggest the larger water bodies within the sub-basin may have supported a large population of SNYLF.

Photo 4: Cagwin Lake looking east (2008 Anthony Oldofredi, CDFG)

Due to the importance of breeding at Lake ID 14334, the sub-basin of networked lakes, including Cagwin, Ralston and Tamarack lakes, is identified as a native species reserve. The three named lakes have a long stocking history and, although stocking was halted in 2000, non-native trout remain in the system. The lakes therefore are subsequently identified as category 2 fish removal sites, indicating fish removal is physically feasible but CDFG acknowledges public use conflicts. Mechanical fish removal efforts began in 2008 by LTBMU biologists. CDFG and LTBMU will monitor SNYLF populations during implementation and after completion of the mechanical fish removal. SNYLF population monitoring during and post fish removal efforts will track the response of the population to fish removal. SNYLF reintroductions may be necessary to increase the colonization rate of the restored habitat and minimize potential genetic bottlenecking.

CDFG recognizes that removing fish from Cagwin, Ralston, and Tamarack (Photo 5) lakes is expected to have the greatest negative effect upon recreational angling of any management direction proposed in this plan. These three lakes are readily accessible fishing destinations that are popular for day hiking anglers in Desolation Wilderness. Ralston and Tamarack lakes, in particular, have a long history of wilderness angling that is closely tied to the local community. Ralston and Tamarack lakes have been stocked by different organizations and agencies for over 80 years.

Photo 5: Tamarack Lake looking west (1948 J.C. Fraser, CDFG)

Jabu Lake, Le Conte Lake, Lucille Lake, Margery Lake and Lake ID 14226 have been identified by CDFG, in coordination with LTBMU biologists, as a native species reserve. CDFG fishery data indicate that Jabu Lake is fishless. However, the remainder of the lakes currently support non-native fish and are identified by CDFG as category 1 fish removal sites (Photo 6). SNYLF have not been observed at these sites. Once mechanical removal efforts are completed the lakes may provide an opportunity to expand the range of SNYLF in the Lake Tahoe basin with reintroductions from populations in surrounding watersheds.

The lakes within this native species reserve are near popular angling destinations (Fig. 2) but are not known to be significant destinations for wilderness anglers. CDFG anticipates little to no negative effect upon recreational angling by removing fish from these lakes.

Photo 6: Rainbow trout sample from an eight hour gill net set in Le Conte Lake (2003, CDFG)

CDFG observed AMMA larvae at Lake ID 14245. This lake will be managed as an amphibian resource. A historic sighting cited in Stebbins (2003) of a BUCA observation at Grass Lake, separated from the nearest known population by 16 miles, has since been corrected. The animal was misidentified in the field and was actually BUBO (Jennings and Hayes 1994).

Fisheries Resources and Management

Of the 17 PWS's in the Desolation Wilderness, Glen Alpine PWS presents the most opportunities for the wilderness angler. Much of the PWS is accessible from short trails and has high day and overnight use (Fig. 2).

Alta Morris Lake was last stocked in 1984 and supports a healthy self-sustaining brook trout fishery. The lake will continue to be managed as a self-sustaining fishery and will not be stocked.

Cathedral Lake is easily accessible and is known as a difficult but rewarding golden trout fishery. It is small with no tributaries and has little to no spawning habitat for golden trout. It has been stocked with golden trout since 1967, however, it is shallow and freezes solid most winters. CDFG will no longer stock Cathedral Lake with golden trout, although it may be planted with Lahontan cutthroat trout in the future.

Over its long stocking history Gilmore Lake has been stocked by CDFG with brown trout, brook trout and rainbow trout. Lahontan redsides, tui chub and suckers have been introduced as forage species but the source of these introductions is unknown. Lake trout are the most recent introduction with the earliest known stocking by CDFG occurring in the 1970s. Gilmore Lake is a popular angling destination and is known to grow very large trout. The large fish are primarily lake trout and brown trout that capitalize on the abundance of forage species present in the lake. Brook trout are the most abundant self-sustaining sport fish in the lake. In recent years, Gilmore Lake has been stocked with large allotments of rainbow trout fingerlings with supplemental lake trout stocking every few years. Fishery data indicate that rainbow trout fingerlings seem to do poorly in the lake and they will no longer be stocked. Instead, the lake will be managed as a self-sustaining fishery and monitored closely until such time that different management is warranted.

Recent fishery surveys in Grass Lake have identified brown trout, brook trout, rainbow trout and Lahontan redsides. The trout have access to a barrier free inlet and outlet system that provides plenty of spawning habitat. Although the lake was most recently stocked with rainbow trout fingerlings, it will be managed as a self-sustaining fishery and will no longer be stocked.

Half Moon Lake currently supports a low density, self-sustaining brook trout population. The lake has been managed as a self-sustaining fishery since 1985 when rainbow trout stocking ceased. The lake presents an opportunity to begin

Lahontan cutthroat trout stocking to add angling diversity within the PWS and to increase the distribution of Lahontan cutthroat trout within the Lake Tahoe basin.

Heather Lake was last stocked in 1968 and has since been managed as a self-sustaining fishery for brook trout and brown trout. Speckled dace and Lahontan redsides are present in the lake and likely contribute a majority of the forage for the trout population. Heather Lake will continue to be managed as a self-sustaining fishery.

Lost Lake was stocked with golden trout fingerlings on top of a self-sustaining brook trout population. The golden trout do not do well and are poorly represented in fishery surveys, both in gill net data and angler reports. Furthermore, the lake is difficult to access and it receives low angling pressure. Therefore due to these factors, it will be managed as a self-sustaining brook trout fishery and will no longer be stocked.

Saucer Lake was stocked with brook trout until 1965 but was switched to golden trout in 1968. The brook trout are self-sustaining but the golden trout are not and thus require stocking to be expressed in the fishery. When stocking resumes Lahontan cutthroat trout will be planted in order to meet objectives of planting more native fish. The lake will be managed as a Lahontan cutthroat trout fishery and stocking will resume with allotments similar to those in the late 1990s.

Susie Lake has been managed as a self-sustaining brook trout fishery since rainbow trout stocking ceased in 1978. Speckled dace and Lahontan redsides are also present and provide abundant forage. Stocking is planned to resume using Lahontan cutthroat trout and CDFG will implement gill net suppression of existing fish populations, if necessary, to establish a Lahontan cutthroat trout fishery.

Triangle Lake was historically stocked with rainbow trout. However, current survey data indicate the lake is not self-sustaining and has gone fishless with the cessation of stocking. Based on the presence of native amphibians nearby, Triangle Lake will no longer be stocked and CDFG will not actively manage the lake.

Lake ID’s 14189 and 14192 are connected to Glen Alpine Creek and are part of the creek’s self-sustaining fishery.

Table 16. Summary of herpetofauna survey data and management for Glen Alpine Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
Alta Morris Lake	14075.00	3-Jul-03	THEL	1	0	0	0	0	Self-sustaining fishery
Cagwin Lake	14332.00	1-Aug-08	None						Native species restoration - Category 2
Cathedral Lake	14079.00	31-Jul-03	None						Not actively managed
Gilmore Lake	14058.00	5-Jul-03	None						Self-sustaining fishery
Grass Lake	14172.00	8-Jul-03	THCO	4	0	0	0	0	Self-sustaining fishery
Half Moon Lake	14060.00	3-Jul-03	THEL	6	0	0	0	0	Stocked lake
Heather Lake	14138.00	4-Jul-03	THEL	7	0	0	0	0	Self-sustaining fishery
Jabu Lake	14218.00	19-Jul-03	None						Native species restoration - Category 1
Le Conte Lake	14191.00	3-Jul-03	None						Native species restoration - Category 1
Lost Lake	14244.00	20-Jul-03	None						Self-sustaining fishery
Lucille Lake	14235.00	20-Jul-03	None						Native species restoration - Category 1
Margery Lake	14255.00	20-Jul-03	None						Native species restoration - Category 1
Ralston Lake	14333.00	1-Aug-08	None						Native species restoration - Category 2
Saucer Lake	14382.00	18-Jul-03	None						Stocked lake
Susie Lake	14119.00	7-Jul-03	THEL	4	0	0	0	0	Stocked lake
Tamarack Lake	14313.00	17-Jul-03	THEL	2	0	0	0	0	Native species restoration - Category 2
		1-Aug-08	HYRE	0	0	0	1	0	
		1-Aug-08	THSI	1	0	0	0	0	
Triangle Lake	14248.00	19-Jul-03	None						Not actively managed
	14062.00	30-Jul-03	HYRE	0	1	875	13	0	Amphibian resource
			THEL	4	0	0	0	0	
	14064.00	6-Jul-03	THEL	1	0	0	0	0	Not actively managed

Table 16, Con't. Summary of herpetofauna survey data and management for Glen Alpine Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
	14068.00	6-Jul-03	HYRE	0	0	0	52	4	Amphibian resource
			THEL	3	0	0	0	0	
	14087.00	4-Jul-03	HYRE	0	0	0	47	0	Amphibian resource
			THEL	1	0	0	0	0	
	14089.00	30-Jul-03	HYRE	0	0	0	50	0	Amphibian resource
			THEL	1	0	0	0	0	
	14091.00	4-Jul-03	HYRE	2	0	0	0	0	Not actively managed
			THEL	1	0	0	0	0	
	14091.01	6-Jul-03	HYRE	0	0	0	0	17	Amphibian resource
	14096.00	4-Jul-03	HYRE	1	0	0	0	0	Not actively managed
	14098.00	4-Jul-03	HYRE	0	0	0	0	18	Amphibian resource
	14106.01	6-Jul-03	HYRE	0	0	0	300	0	Amphibian resource
	14127.00	5-Jul-03	HYRE	0	0	0	735	0	Amphibian resource
	14128.00	5-Jul-03	THEL	1	0	0	0	0	Not actively managed
	14138.01	7-Jul-03	HYRE	0	0	0	200	0	Amphibian resource
	14138.02	7-Jul-03	HYRE	0	0	0	11	0	Amphibian resource
	14138.03	7-Jul-03	HYRE	0	0	0	175	0	Amphibian resource
	14146.01	3-Jul-03	HYRE	0	0	0	0	53	Amphibian resource
	14156.00	7-Jul-03	HYRE	0	0	0	54	0	Amphibian resource
	14167.00	7-Jul-03	HYRE	0	0	0	97	0	Amphibian resource
	14176.00	8-Jul-03	HYRE	0	0	0	4000	0	Amphibian resource
			THCO	1	0	0	0	0	
	14179.00	7-Jul-03	HYRE	0	0	0	22	0	Amphibian resource
	14186.00	4-Jul-03	HYRE	0	0	0	0	2	Amphibian resource
	14186.01	6-Jul-03	HYRE	0	0	0	0	18	Amphibian resource
	14192.00	8-Jul-03	THCO	1	0	0	0	0	Self-sustaining fishery
	14193.00	7-Jul-03	THEL	2	0	0	0	0	Not actively managed
	14195.00	8-Jul-03	HYRE	0	0	0	900	0	Amphibian resource
	14206.00	8-Jul-03	HYRE	0	0	0	2500	0	Amphibian resource
	14206.01	8-Jul-03	HYRE	0	0	0	2000	0	Amphibian resource

Table 16, Con't. Summary of herpetofauna survey data and management for Glen Alpine Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
	14222.00	19-Jul-03	HYRE	0	0	0	600	0	Amphibian resource
			THEL	2	0	0	0	0	
	14224.01	19-Jul-03	HYRE	0	0	0	200	0	Amphibian resource
	14224.02	19-Jul-03	HYRE	0	0	0	200	0	Amphibian resource
	14226.00	19-Jul-03	HYRE	0	0	0	200	0	Native species restoration - Category 1
	14228.00	20-Jul-03	HYRE	0	0	0	40	0	Amphibian resource
	14230.00	19-Jul-03	HYRE	0	0	0	6	0	Amphibian resource
	14232.00	19-Jul-03	HYRE	0	0	0	200	0	Amphibian resource
	14234.00	19-Jul-03	HYRE	0	0	0	5	0	Amphibian resource
	14237.00	19-Jul-03	HYRE	0	0	0	100	0	Amphibian resource
	14241.00	20-Jul-03	HYRE	0	0	0	90	0	Amphibian resource
	14242.01	19-Jul-03	HYRE	0	0	0	90	0	Amphibian resource
	14245.00	12-Aug-04	AMMA	0	0	0	4	0	Amphibian resource
		3-Jul-08	HYRE	0	0	0	890	1	
	14248.02	19-Jul-03	HYRE	0	0	0	220	0	Amphibian resource
			THEL	1	0	0	0	0	
	14250.00	21-Jul-03	HYRE	0	0	0	37	0	Amphibian resource
	14253.00	20-Jul-03	HYRE	0	0	0	7	0	Amphibian resource
	14323.00	1-Aug-08	HYRE	0	0	0	296	0	Amphibian resource
			THSI	2	0	0	0	0	
	14325.00	1-Aug-08	HYRE	0	0	0	64	0	Amphibian resource
	14326.00	1-Aug-08	HYRE	0	0	0	32	0	Amphibian resource
			THSI	1	0	0	0	0	
	14327.00	19-Jul-03	HYRE	0	0	0	600	0	Amphibian resource
			THEL	4	0	0	0	0	
	14329.00	1-Aug-08	HYRE	0	0	0	73	0	Amphibian resource
			THSI	3	0	0	0	0	
	14330.00	21-Jul-03	HYRE	0	0	0	400	0	Amphibian resource
		17-Jul-03	THEL	1	0	0	0	0	Native species restoration - Category 2
		1-Aug-08	HYRE	0	0	2	245	0	
			THSI	3	0	0	0	0	
	14347.00	1-Aug-08	HYRE	0	0	0	414	0	Amphibian resource
			THSI	1	0	0	0	0	

Table 17. Summary of fish population data for Glen Alpine Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Alta Morris Lake	14075.00	3-Jul-03	BK	yes	20	221	108	0.868
Cagwin Lake	14332.00	1-Aug-08	None					
Cathedral Lake	14079.00	31-Jul-03	None					
Gilmore Lake	14058.00	5-Jul-03	BK	yes	2	388	430	0.737
Grass Lake	14172.00	8-Jul-03	BK	yes	7	304	269	0.888
			BN	yes	9	383	475	0.824
			LRS	yes	24	95	8	0.838
			RT	yes	1	334	360	0.966
Half Moon Lake	14060.00	3-Jul-03	BK	yes	3	391	670	1.117
Heather Lake	14138.00	4-Jul-03	BK	yes	13	293	267	0.942
			BN	yes	3	466	710	0.702
			DC	yes	10	91	8	0.984
			LRS	yes	25	100	9	0.847
Jabu Lake	14218.00	19-Jul-03	None					
Le Conte Lake	14191.00	3-Jul-03	RT	no	2	295	213	0.825
Lost Lake	14244.00	20-Jul-03	BK	yes	23	215	97	0.935
Lucille Lake	14235.00	20-Jul-03	BK	yes	11	236	129	0.991
Margery Lake	14255.00	20-Jul-03	BK	unknown	6	355	580	1.285
Ralston Lake	14333.00	1-Aug-08	None					
Saucer Lake	14382.00	18-Jul-03	BK	yes	31	181	59	0.871
Susie Lake	14119.00	7-Jul-03	BK	yes	11	295	227	0.814
			DC	yes	18	98	7	0.744
			LRS	yes	3			
Tamarack Lake	14313.00	1-Aug-08	None					
Triangle Lake	14248.00	19-Jul-03	RT	unknown	9	280	203	0.921
	14065.00	6-Jul-03	BK	yes	12	257	159	0.871
	14189.00	8-Jul-03	BK	yes	4	252	155	0.954
			BN	yes	6	299	261	0.915
			DC	yes	2	76	4	0.911
			LRS	yes	1	90	7	0.960
	14192.00	8-Jul-03	BK	yes	2	290	298	1.050
			DC	yes	2			
			LRS	yes	1			
	14226.00	19-Jul-03	BK	yes	3	320	383	1.151

Table 18. Summary of fisheries management information for Glen Alpine Creek PWS.

Lake Name	Lake ID	First Recorded Stocking	Last Recorded Stocking	Pre-Survey Allotments	Current Proposed Allotment	Management Direction
Alta Morris Lake	14075.00	1934 - BK 1966 - RT	1984 - BK 1981 - RT	DNP	DNP	Self-sustaining fishery
Cagwin Lake	14332.00	1934 - RT 1935 - BK	1942 - BK 1999 - RT	500 RT ANN	DNP	Native species restoration - Category 2
Cathedral Lake	14079.00	1940 - BK	2000 - BK	500 GT ANN	DNP	Not actively managed
Gilmore Lake	14058.00	1930 - BK 1934 - BN 1978 - LT 1930 - RT	1937 - BK 1942 - BN 1996 - LT 2002 - RT	12000 RT ANN	DNP	Self-sustaining fishery
Grass Lake	14172.00	1930 - BK 1931 - BN 1930 - RT	1993 - BK 1931 - BN 2000 - RT	1000 RT ANN	DNP	Self-sustaining fishery
Half Moon Lake	14060.00	1930 - BK 1930 - RT	1976 - BK 1985 - RT	DNP	1000 CT-L ANN	Stocked lake
Heather Lake	14138.00	1930 - BN 1941 - RT	1968 - BN 1965 - RT	DNP	DNP	Self-sustaining fishery
Jabu Lake	14218.00	1966 - GT	2000 - GT	250 GT ANN	DNP	Native species restoration - Category 1
Le Conte Lake	14191.00	1969 - BK 1932 - RT	1998 - BK 1999 - RT	1000 RT BNO	DNP	Native species restoration - Category 1
Lost Lake	14244.00	1942 - BK 1968 - GT	1953 - BK 1999 - GT	500 GT ANN	DNP	Self-sustaining fishery
Lucille Lake	14235.00	1930 - BK	1974 - BK	DNP	DNP	Native species restoration - Category 1
Margery Lake	14255.00	1930 - BK 1968 - RT	2000 - BK 1972 - RT	1000 BK ANN	DNP	Native species restoration - Category 1
Ralston Lake	14333.00	1932 - BK 1932 - RT	1996 - BK 2000 - RT	1500 RT ANN	DNP	Native species restoration - Category 2
Saucer Lake	14382.00	1951 - BK 1932 - GT 1933 - RT	1965 - BK 1999 - GT 1934 - RT	500 GT ANN	500 CT-L ANN	Stocked lake
Susie Lake	14119.00	1930 - BK 1955 - RT	1954 - BK 1978 - RT	DNP	2000 CT-L ANN	Stocked lake

Table 18, Con't. Summary of fisheries management information for Glen Alpine Creek PWS.

Lake Name	Lake ID	First Recorded Stocking	Last Recorded Stocking	Pre-Survey Allotments	Current Proposed Allotment	Management Direction
Tamarack Lake	14313.00	1950 - BK 1924 - CT-L 1925 - RT 1931 - SH	2000 - BK 1927 - CT-L 1939 - RT 1933 - SH	BK ANN	DNP	Native species restoration - Category 2
Triangle Lake	14248.00	1935 - BK 1968 - RT	1969 - BK 2000 - RT	250 RT ANN	DNP	Not actively managed
	14065.00			DNP	DNP	Self-sustaining fishery
	14189.00			DNP	DNP	Self-sustaining fishery
	14192.00			DNP	DNP	Self-sustaining fishery
	14226.00			DNP	DNP	Native species restoration - Category 1

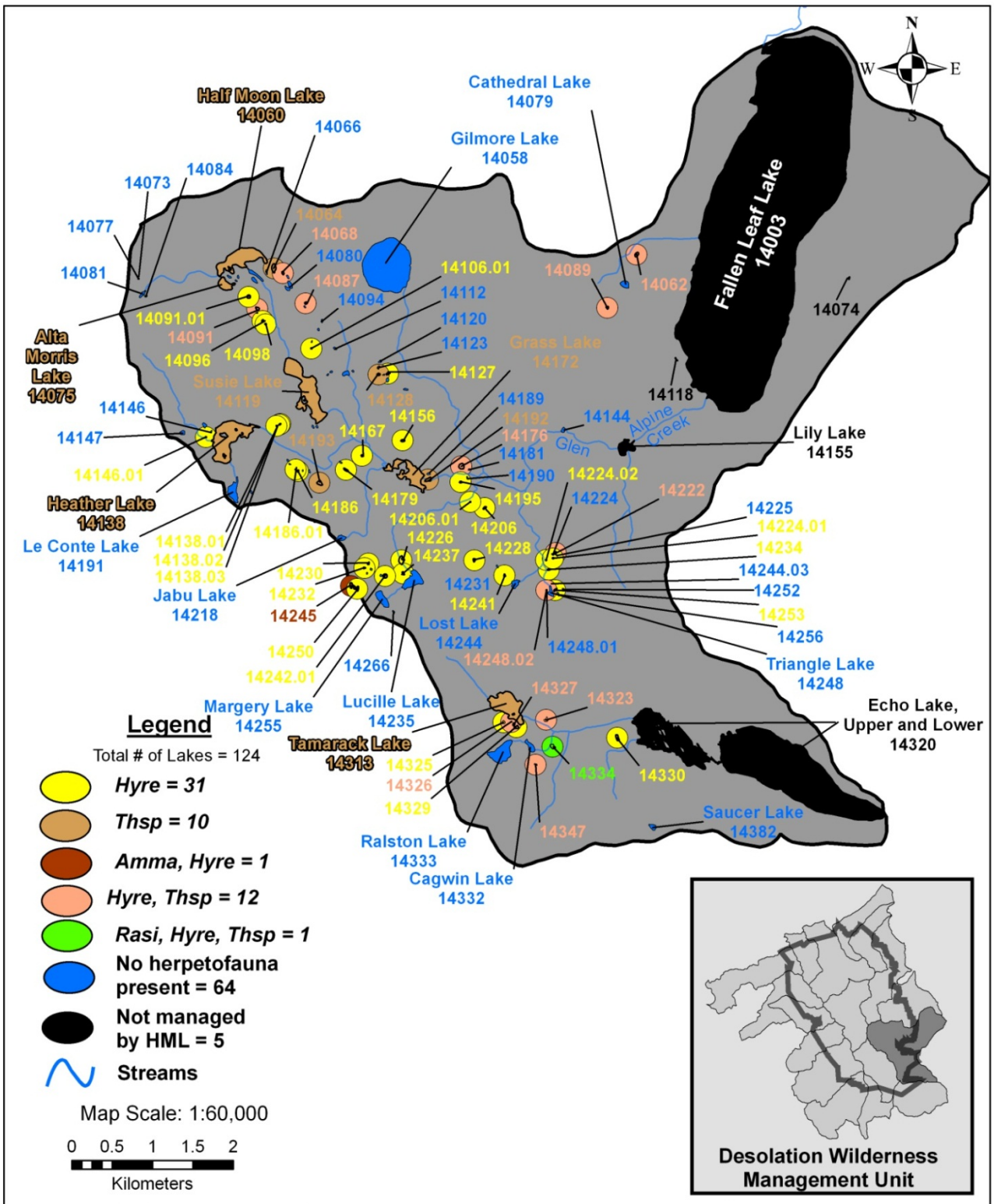

Figure 18: Herpetofauna species distribution in Glen Alpine Creek Planning Watershed during 2003 and 2004 surveys. (1 of 2)

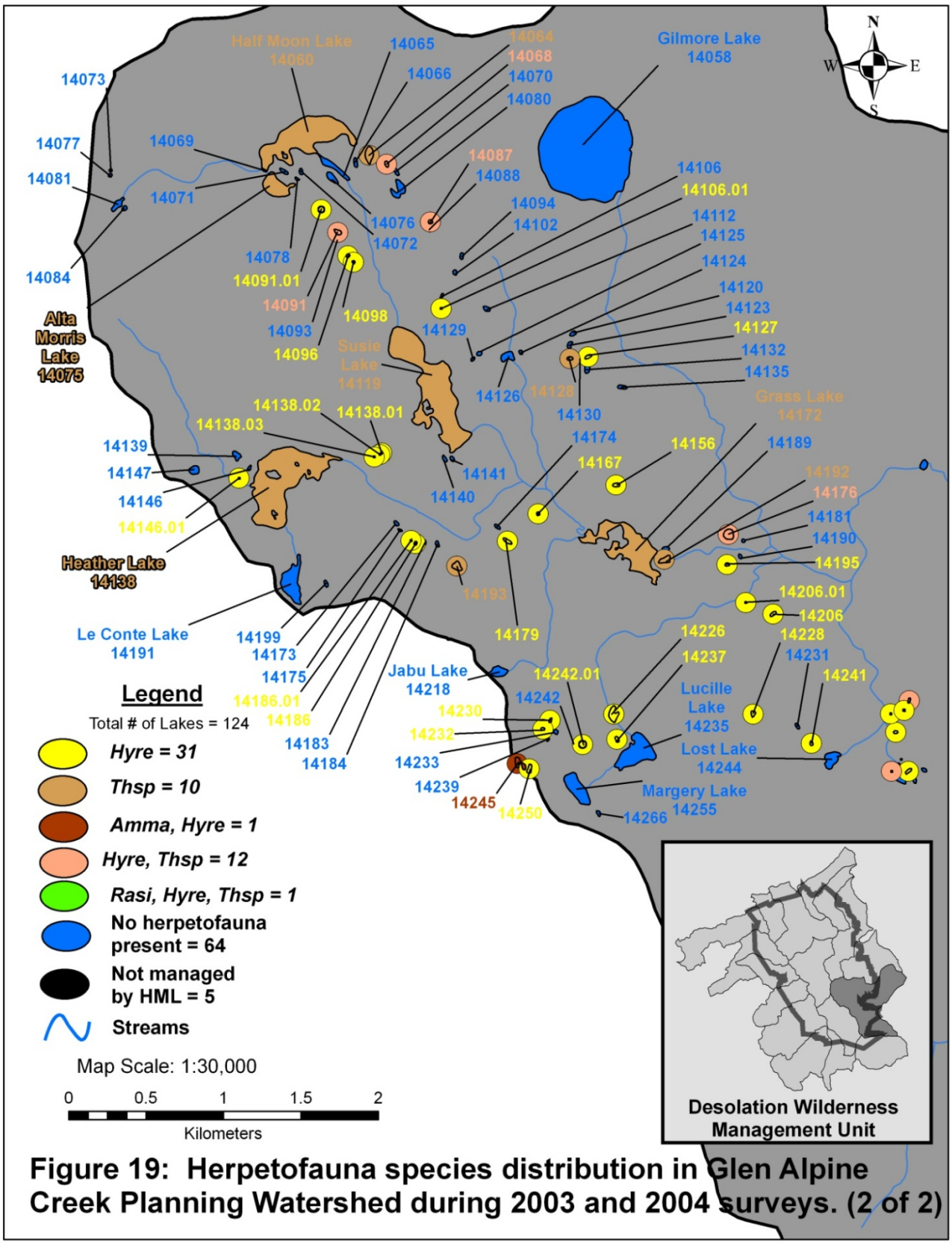

Figure 19: Herpetofauna species distribution in Glen Alpine Creek Planning Watershed during 2003 and 2004 surveys. (2 of 2)

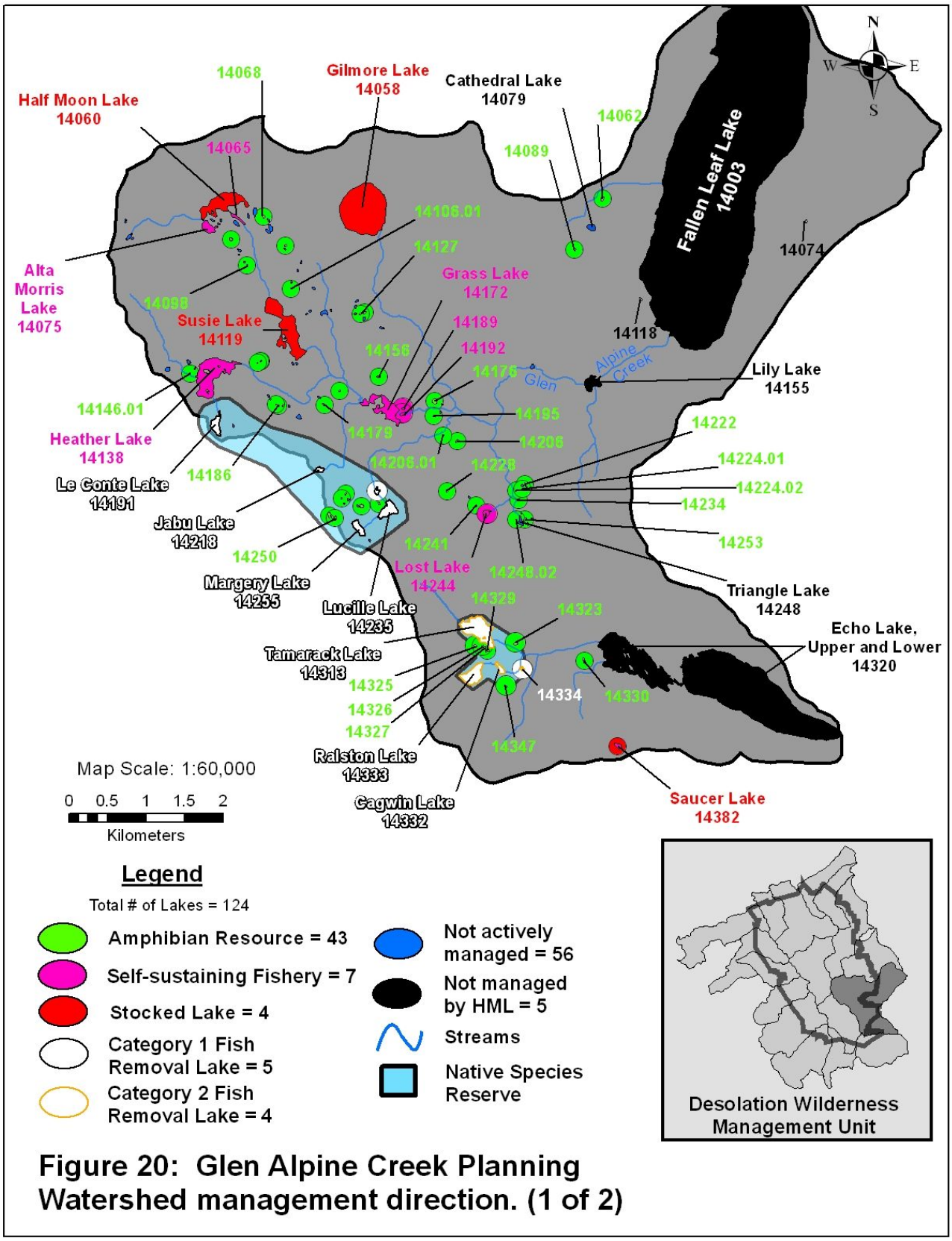

Figure 20: Glen Alpine Creek Planning Watershed management direction. (1 of 2)

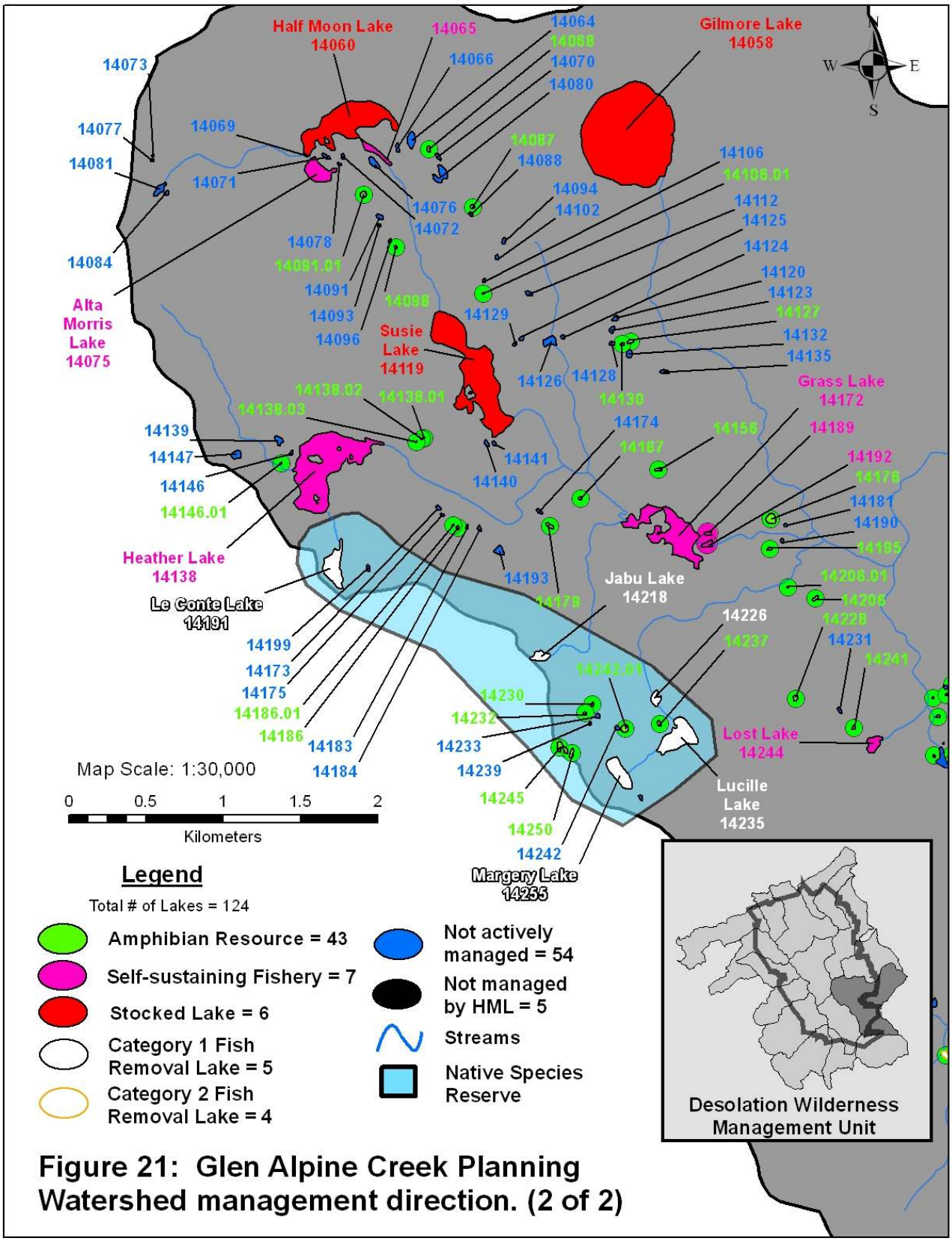

Figure 21: Glen Alpine Creek Planning Watershed management direction. (2 of 2)

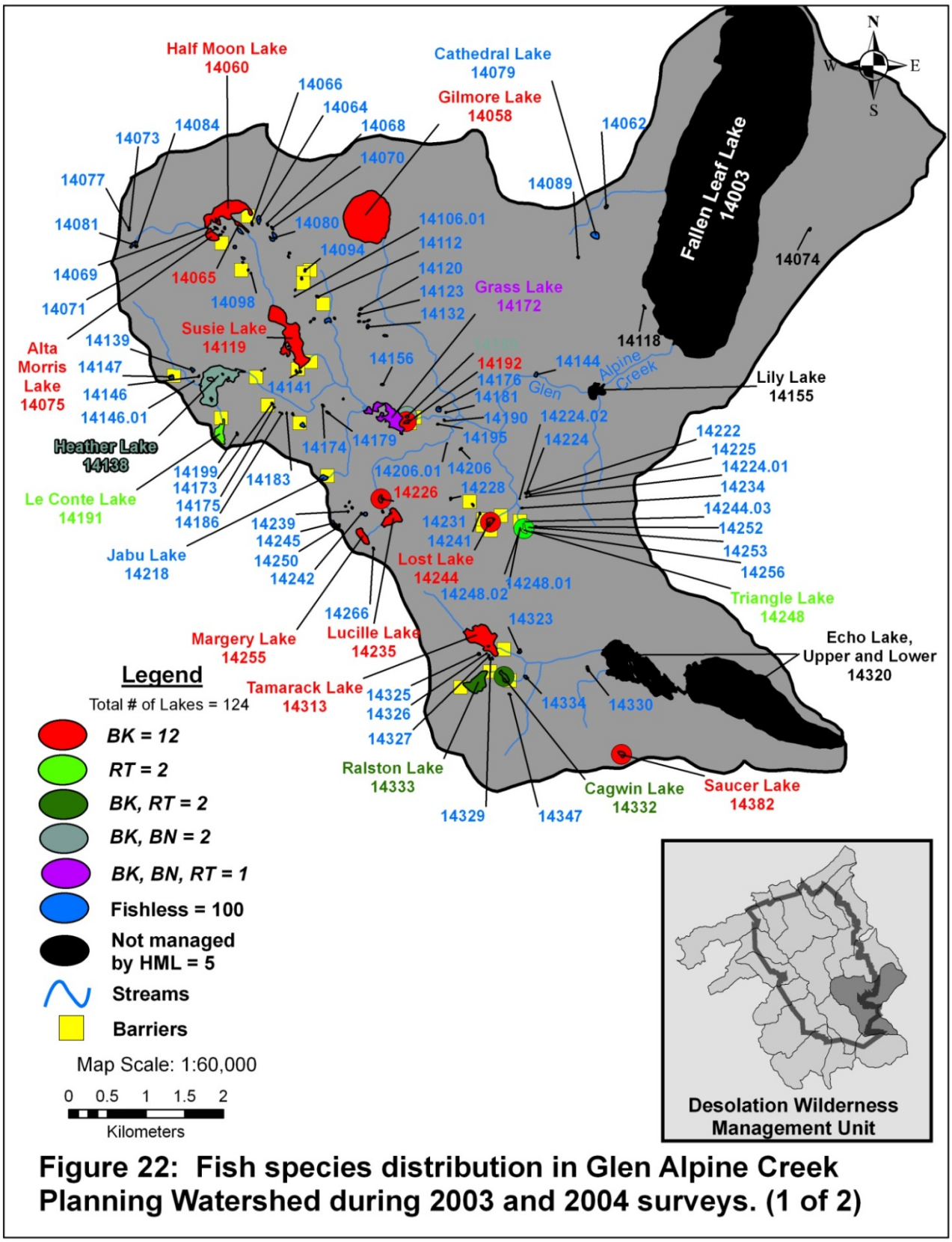

Figure 22: Fish species distribution in Glen Alpine Creek Planning Watershed during 2003 and 2004 surveys. (1 of 2)

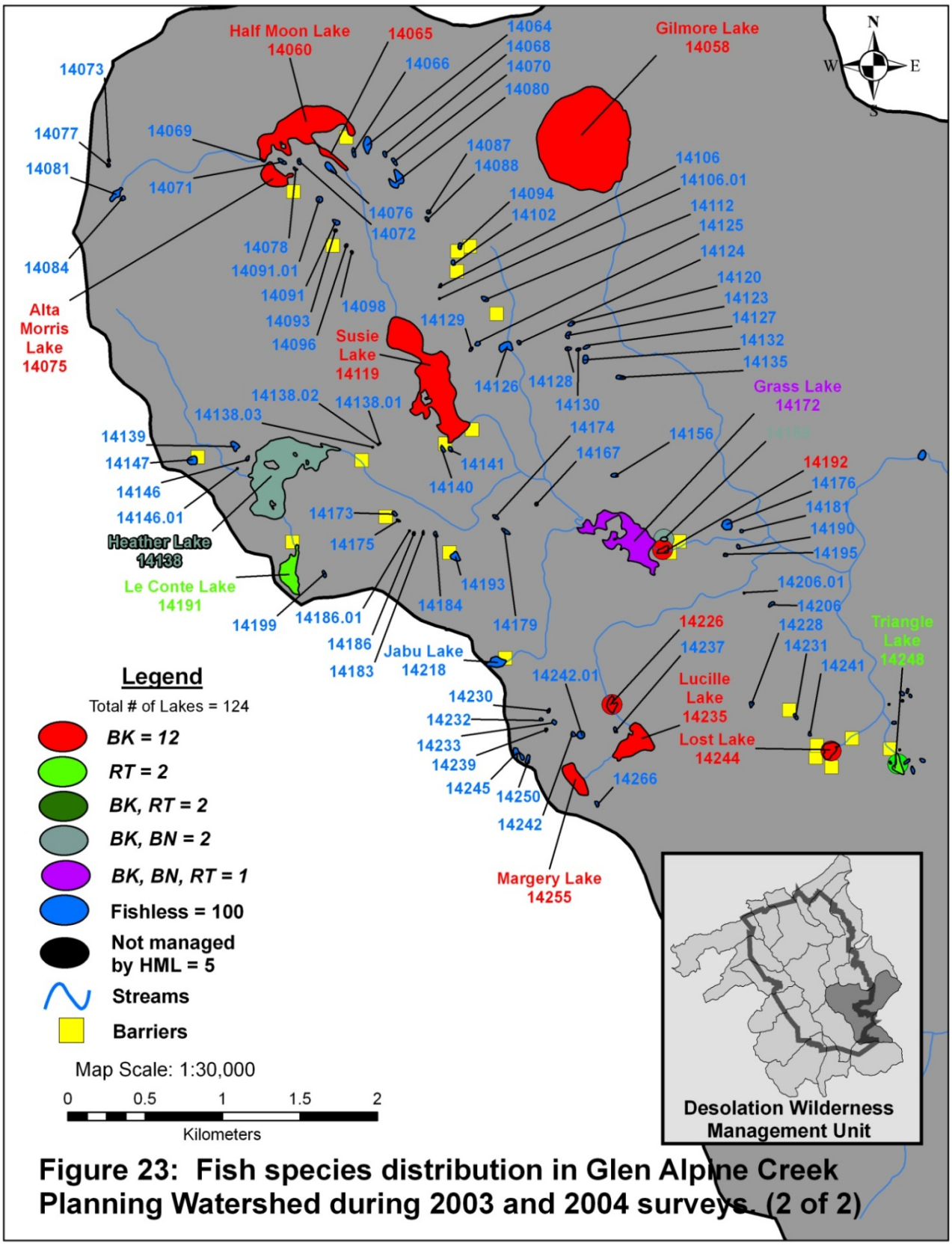

Figure 23: Fish species distribution in Glen Alpine Creek Planning Watershed during 2003 and 2004 surveys. (2 of 2)

7) JONES FORK SILVER CREEK PLANNING WATERSHED MANAGEMENT DIRECTION

Jones Fork Silver Creek PWS drains to Union Valley Reservoir and is part of the South Fork American River watershed. It is accessed from Wrights Lake via the Tyler Trail and the Rockbound Trail, both of which are popular day use trails. There are four named lakes and 37 unnamed water bodies within the PWS boundary. Dark Lake, one of the four named lakes, is a road-accessible water body and is not addressed in this plan.

Table 19 provides summary data for amphibian resources and management in the Jones Fork Silver Creek PWS. Table 20 provides a summary of fish population data for the Jones Fork Silver Creek PWS. Table 21 provides a summary of fisheries management for the Jones Fork Silver Creek PWS. Figure 24 provides herpetofauna species distribution for the Jones Fork Silver Creek PWS. Figure 25 provides the management direction for the Jones Fork Silver Creek PWS. Figure 26 provides fish species distribution for the Jones Fork Silver Creek.

Herpetofauna Resources and Management

SNYLF were detected by CDFG field crews within Jones Fork Silver Creek PWS at Gertrude Lake and Lake ID's 14116 and 14121.01. Gertrude Lake is the only water body deep enough for over-wintering SNYLF. CDFG surveys found both SNYLF larvae and non-native trout present in the lake. As a result, the upper Gertrude Lake sub-basin was identified as a native species reserve and golden trout stocking was halted in 2000.

Photo 7: CDFG personnel working gill nets in Gertrude Lake (2002 Stafford Lehr, CDFG)

Due to lack of natural reproduction, the brook trout population in Gertrude Lake dwindled without supplemental fingerling stocking. The remaining brook trout and golden trout were removed using monofilament gill nets in 2002 and 2004 (Photos 7 and 8). Gill net monitoring in 2008 yielded no trout, indicating the lake is fishless.

Photo 8: Large brook trout netted from Gertrude Lake (2002 Stafford Lehr, CDFG)

Brook trout were also found in two tarns upstream of Gertrude Lake, Lake ID's 14109 and 14115. In 2001, the Eldorado National Forest and CDFG unsuccessfully attempted to siphon water from the tarns to lower the water level sufficiently to winter kill the trout population. This operation failed and subsequently intensive gill netting was selected to achieve the goal of removing the brook trout from the tarns. Gill nets were set during the winter from 2002 to 2006. Gill net surveys in 2010 caught no fish, indicating the fish removal effort was successful.

The SNYLF population located in the Gertrude Lake sub-basin is very small and is suspected to be positive for Bd. Surveys as early as 1995 documented low numbers of breeding individuals and 2008 monitoring surveys detected a single adult. It is unclear at this time whether the population will recover despite the removal of non-native trout. SNYLF reintroductions may be necessary to increase the colonization rate of restored habitat and to minimize a potential genetic bottleneck.

Removing fish from Gertrude Lake has negatively affected recreational angling opportunities by eliminating a day-hike-accessible golden trout fishery. Lake ID's

14109 and 14115 receive very little visitation and removing fish from these tarns had little to no negative effect upon angling opportunities.

Tyler Lake (Photo 9) was stocked historically with brook trout until 2000. The lake has little to no spawning habitat and the lake went fishless in the absence of stocking. As per “California Department of Fish & Game Gertrude and Tyler Lakes Basin Management Strategy” (CDFG 2004), Tyler Lake was to be managed as a put-and-grow golden trout fishery to help offset the loss of angling opportunity at Gertrude Lake. Golden trout stocking began in 2007 and subsequent monitoring indicated the fishery was healthy. However, due to changes in USFS wilderness management objectives, the entire Gertrude Lake sub-basin, including Tyler Lake, will be managed as a native species reserve. Tyler Lake will no longer be stocked. CDFG anticipates the lake will return to a fishless condition without further action, however additional monitoring will be necessary to ensure the golden trout are not naturally reproducing and the fishery is declining without additional action. The SNYLF population at Gertrude Lake is exceedingly small and is not expected to expand into Tyler Lake. Furthermore, there is no perennial connection between the Tyler Lake outlet and the Gertrude Lake outlet further decreasing the likelihood that SNYLF will naturally expand to the lake. SNYLF reintroductions may be necessary to establish SNYLF at Tyler Lake.

Photo 9: Tyler Lake looking north (2008 Anthony Oldofredi, CDFG)

CDFG field crews found AMMA at six water bodies within the Jones Fork Silver Creek PWS. Lake ID’s 14122, 14137, 14154, 14168, 14249 and 14272 are all small unnamed ponds. Due to detections of AMMA breeding, these ponds will be managed as amphibian resources.

Fisheries Resources and Management

Tyler Lake was stocked historically with brook trout for over five decades. Stocking was ceased in 2000 due to the presence of SNYLF at nearby Gertrude Lake until such time a management plan could be developed. Without stocking the lake went fishless due to a lack of spawning habitat. CDFG intended to manage the lake as a put-and-grow golden trout fishery to offset the loss of recreational angling at Gertrude Lake. However, due to shifting USFS wilderness management objectives, the lake will no longer be stocked and will be managed as a native species reserve to benefit the SNYLF population at Gertrude Lake.

Maud Lake is a popular overnight destination accessed via the well-used Rockbound Pass Trail. It was stocked by CDFG with rainbow trout until 2000. CDFG gill net samples in 2002 and 2010 indicate rainbow trout and brown trout are present in the lake and self-sustaining. As a result, the lake will be managed as a self-sustaining fishery.

Trout were observed at Lake ID 14131 in 2002 however the site is a small pool along an ephemeral stream and was dry during a subsequent survey in 2008. This site does not provide suitable trout habitat and the 2002 observation is considered to be anomalous. Therefore, the site will not be actively managed by CDFG.

Table 19. Summary of herpetofauna survey data and management for Jones Fork Silver Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
Gertrude Lake	14121.00	18-Jul-08	HYRE	0	0	0	36	17	Native species restoration - Category 1
			SNYLF	1	0	0	0	0	
			THCO	1	0	0	0	0	
Maud Lake	14086.00	28-Aug-02	HYRE	6	3	0	16	0	Self-sustaining fishery
			THCO	1	0	0	0	0	
			THEL	1	0	0	0	0	
Tyler Lake	14136.00	18-Jul-08	None						Native species restoration - Category 1
	14097.00	28-Aug-02	HYRE	1	0	0	81	0	Amphibian resource
			THEL	1	2	0	0	0	
	14103.00	28-Aug-02	HYRE	5	6	0	12	0	Amphibian resource
	14108.00	29-Aug-02	HYRE	18	0	0	0	0	Not actively managed
	14110.00	28-Aug-02	HYRE	0	0	0	31	0	Amphibian resource
	14114.00	28-Aug-02	HYRE	3	22	0	603	0	Amphibian resource
			THEL	4	0	0	0	0	
	14116.00	13-Jul-04	SNYLF	0	0	0	3	0	Amphibian resource
		18-Jul-08	HYRE	0	0	0	34	0	
		18-Jul-08	THEL	1	0	0	0	0	
	14116.02	14-Jul-04	HYRE	0	0	0	35	0	Amphibian resource
	14121.01	18-Jul-08	HYRE	0	0	0	89	0	Not actively managed
			THEL	0	1	0	0	0	
			SNYLF	1	0	0	0	0	
	14122.00	2-Aug-05	SNYLF	0	0	0	810	0	Amphibian resource
		10-Aug-08	HYRE	0	1	0	83	0	
	14122.00	10-Aug-08	AMMA	0	0	0	3	0	Amphibian resource
			THEL	1	0	0	0	0	
	14133.01	29-Aug-02	HYRE	0	0	0	5	0	Amphibian resource
	14134.00	18-Jul-08	HYRE	0	0	0	695	0	Amphibian resource
		2-Aug-05	THCO	1	0	0	0	0	
	14137.00	18-Jul-08	AMMA	1	0	0	0	0	Amphibian resource
		2-Aug-05	THEL	1	0	0	0	0	
	14154.00	28-Aug-02	AMMA	0	0	0	5	0	Amphibian resource
			HYRE	1	0	0	0	0	
			THEL	1	1	0	0	0	
	14160.00	28-Aug-02	HYRE	11	5	0	8	0	Amphibian resource
			THEL	1	0	0	0	0	
	14165.00	28-Aug-02	HYRE	2	1	0	3	0	Amphibian resource
	14168.00	28-Aug-02	AMMA	0	0	0	1	0	Amphibian resource
	14249.00	28-Aug-02	HYRE	24	2	0	9	0	Amphibian resource
			AMMA	0	0	0	1	0	

Table 20. Summary of fish population data for Jones Fork Silver Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Gertrude Lake	14121.00	18-Jul-08	None					
Maud Lake	14086.00	28-Aug-02	BN	yes	2	306	281	0.950
		18-Aug-10	BN	yes	38	254	222	0.874
			RT	yes	2	211	92	0.882
Tyler Lake	14136.00	17-Jul-08	GT	unknown	54	122	19	1.014
	14095.00	28-Aug-02	RT	yes				
	14109.00	4-Oct-01	BK	yes	20	172	49	0.870
			GT	yes	2	177	47	0.848
	14115.00	4-Oct-01	BK	yes	16	203	77	0.900
	14131.00	29-Aug-02	BK	yes				

Table 21. Summary of fisheries management information for Jones Fork Silver Creek PWS.

Lake Name	Lake ID	First Recorded Stocking	Last Recorded Stocking	Pre-Survey Allotments	Current Proposed Allotment	Management Direction
Gertrude Lake	14121.00	1945 - BK 1968 - GT	1965 - BK 2000 - GT	500 GT ANN	DNP	Native species restoration - Category 1
Maud Lake	14086.00	1931 - RT	2000 - RT	1000 RT ANN	DNP	Self-sustaining fishery
Tyler Lake	14136.00	1942 - BK 2007 - GT	1953 - BK 2007 - GT	500 BK BNE	DNP	Native species restoration – Category 1
	14095.00			DNP	DNP	Self-sustaining fishery
	14109.00			DNP	DNP	Native species restoration - Category 1
	14115.00			DNP	DNP	Native species restoration - Category 1
	14131.00			DNP	DNP	Not actively managed

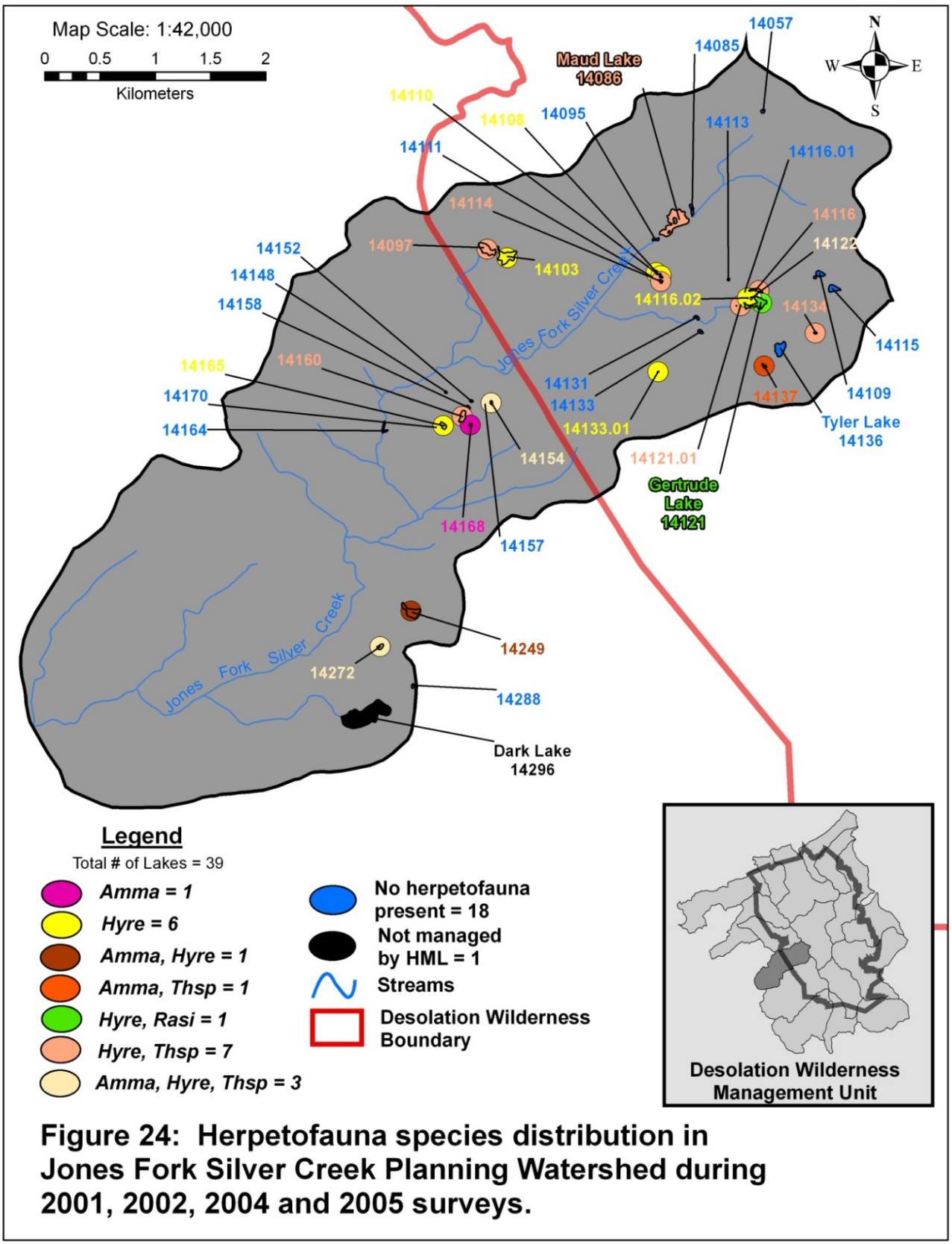

Figure 24: Herpetofauna species distribution in Jones Fork Silver Creek Planning Watershed during 2001, 2002, 2004 and 2005 surveys.

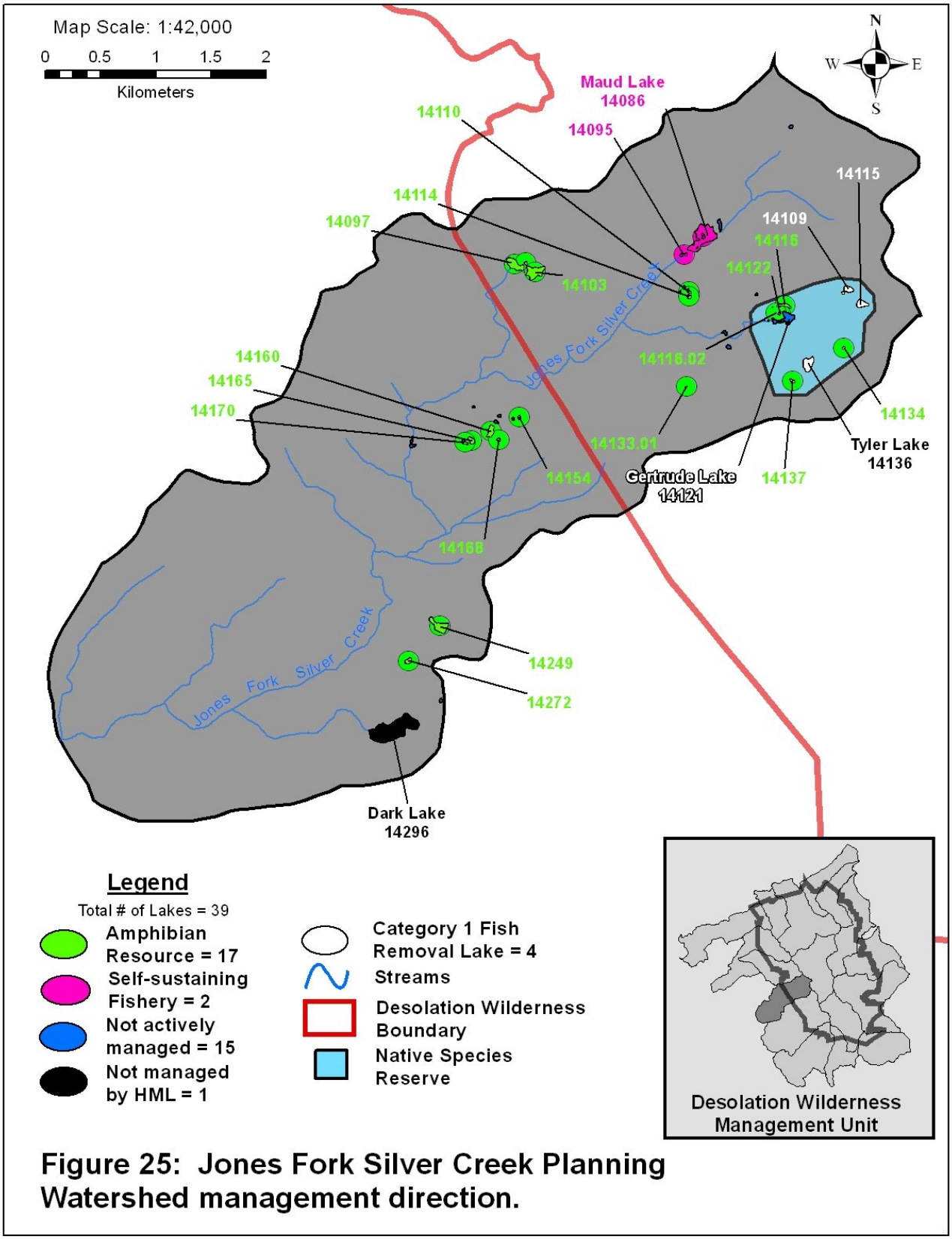

Figure 25: Jones Fork Silver Creek Planning Watershed management direction.

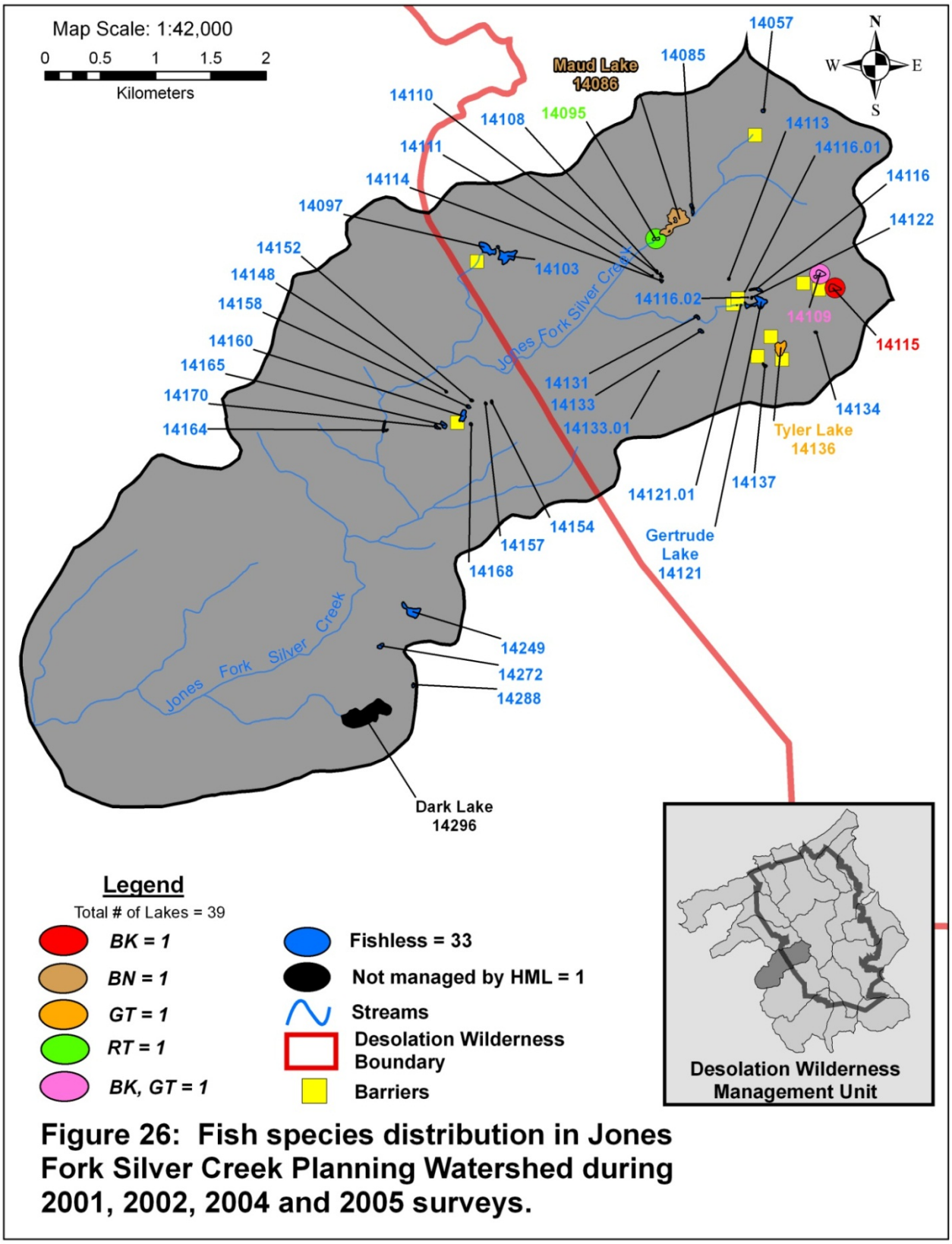

Figure 26: Fish species distribution in Jones Fork Silver Creek Planning Watershed during 2001, 2002, 2004 and 2005 surveys.

8) LAKE SCHMIDELL PLANNING WATERSHED MANAGEMENT DIRECTION

Lake Schmidell PWS forms the headwaters of the Rubicon River and drains north from Desolation Wilderness to Hell Hole Reservoir and ultimately to the Middle Fork American River. Five named lakes and 26 unnamed waters are found within the watershed boundaries. The area is most easily accessed via the Pacific Crest Trail trailhead at Echo lakes, Rockbound Trail near Wrights Lake or the Bayside Trail near Emerald Bay.

Table 22 provides summary data for amphibian resources and management in the Lake Schmidell PWS. Table 23 provides a summary of fish population data for the Lake Schmidell PWS. Table 24 provides a summary of fisheries management for the Lake Schmidell PWS. Figure 27 provides herpetofauna species distribution for the Lake Schmidell PWS. Figure 28 provides the management direction for the Lake Schmidell PWS. Figure 29 provides fish species distribution for the Lake Schmidell PWS.

Herpetofauna Resources and Management

Recent surveys found SNYLF within Lake Schmidell PWS at Clyde Lake and Lake ID's 14142 and 14143. In addition to SNYLF, AMMA adults have been observed at Clyde Lake.

Eldorado National Forest and CDFG surveys conducted in the 1990s found SNYLF breeding locations at Lake ID 14048.01 and in the outlet of Lower Doris Lake (Davidson 1998). In addition, two adult SNYLF were observed on multiple occasions in the outlet of Lois Lake. However, subsequent surveys by Eldorado National Forest and CDFG indicate SNYLF are no longer present at any of these sites.

Due to a breeding population of SNYLF in Clyde Lake and the adjacent ponds, the area has been designated as a native species reserve and stocking has been halted indefinitely. Clyde Lake has a long stocking history dating back to 1932 but has been stocked solely with golden trout since 1962. It was last stocked in 2000 and gill net surveys in 2008 and 2010 confirm the golden trout population has subsequently died out. Lake ID 14143 is also fishless and SNYLF larvae have been observed by CDFG during multiple surveys. Fish are present in the outlet of Clyde Lake and presumably Lake ID 14142 as well. The fish are excluded from Clyde Lake by a manmade check dam. CDFG identifies the need to remove fish from the outlet stream to a suitable fish barrier further downstream from Clyde Lake to buffer between fish occupied water and SNYLF breeding waters. However, a suitable barrier has not yet been identified nor has the potential project been assessed for feasibility.

Fisheries Resources and Management

Lake Schmidell PWS sits near the center of Desolation Wilderness and provides opportunities for an authentic wilderness angling experience. Principal among those opportunities is the Rubicon River. Although no fisheries data have been collected for the Rubicon River by the HML project, it is known to support self-sustaining populations of multiple trout species in a classic mountain stream setting.

The Doris lakes (Photo 10) were originally stocked with brook trout up to the 1960s when the allotment shifted to golden trout. The lakes were last stocked with golden trout in 2000. Brook trout are self-sustaining in both lakes and 2001 gill net data indicate the species is abundant with an even distribution of size classes. Golden trout are less abundant but may also be self-sustaining. The lakes will continue to be stocked with golden trout at historic levels to help maintain the golden trout population and to provide angling diversity within the Desolation Wilderness.

Photo 10: Lower Doris Lake looking southwest (1949 J.C. Fraser, CDFG)

Gill net data collected in 2003 indicate Lois Lake supports a self-sustaining brook trout population. The lake was originally stocked with brook trout in the 1940s and was last stocked in 1964. The brook trout population has persisted and remains healthy; therefore the lake will not be stocked and will continue to be managed as a self-sustaining fishery.

Similar to Lois Lake, Schmidell Lake was stocked with brook trout from the 1930s until 1964. Management has remained unchanged for the past 40 years. Gill net samples in 2005 indicate a self-sustaining brook trout population. The lake will be managed as a self-sustaining fishery in accord with its historic management.

Middle Velma Lake is a well-known trophy rainbow trout fishery and has earned a distinguished reputation amongst Desolation Wilderness anglers. It has been stocked with rainbow trout since the 1940s without any variation in species. HML gill net data collected in 2003 demonstrate the rainbow trout population is not self-sustaining and has dwindled in the absence of stocking. Rainbow trout stocking will resume in numbers and frequency similar to historic management to reestablish this trophy fishery.

Table 22. Summary of herpetofauna survey data and management for Lake Schmidell PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
Clyde Lake	14149.00	4-Aug-03	AMMA	2	0	0	0	0	Amphibian resource
		4-Aug-03	THCO	3	0	0	0	0	
		29-Jul-05	HYRE	0	0	0	20	0	
		31-Jul-08	SNYLF	11	1	0	75	0	
Doris Lake, Lower	14048.00	12-Aug-05	None						Stocked lake
Doris Lake, Upper	14051.00	12-Aug-05	None						Stocked lake
Lake Schmidell	13968.00	3-Aug-03	None						Self-sustaining fishery
Lois Lake	14014.00	2-Aug-03	None						Self-sustaining fishery
Velma Lake, Middle	13942.00	6-Jul-03	None						Stocked lake
	13949.00	10-Jul-01	HYRE	0	0	0	20	0	Amphibian resource
	13950.00	6-Jul-03	HYRE	0	0	0	600	0	Amphibian resource
	13952.00	10-Jul-01	HYRE	0	16	0	0	0	Not actively managed
	13961.00	1-Aug-03	HYRE	0	0	0	1	0	Amphibian resource
	13964.00	1-Aug-03	HYRE	0	0	0	13	0	Amphibian resource
			THCO	1	0	0	0	0	
	13968.01	9-Jul-01	HYRE	0	0	0	80	0	Amphibian resource
	13969.00	9-Jul-01	HYRE	0	0	0	15	0	Amphibian resource
	13970.00	1-Aug-03	HYRE	0	0	0	36	0	Amphibian resource
	13979.00	9-Jul-01	BUBO	0	0	0	100	0	Amphibian resource
			HYRE	0	0	0	10	0	
			THEL	1	0	0	0	0	
	13991.00	3-Aug-03	HYRE	0	0	0	450	0	Amphibian resource
	13992.00	3-Aug-03	HYRE	0	0	0	35	0	Amphibian resource
	14000.00	3-Aug-03	HYRE	0	0	0	26	0	Amphibian resource
	14000.01	3-Aug-03	HYRE	0	0	0	45	0	Amphibian resource
	14023.00	12-Jul-01	HYRE	0	0	0	100	0	Amphibian resource
			THEL	1	0	0	0	0	
	14024.00	5-Aug-03	HYRE	0	0	0	1140	0	Amphibian resource
	14028.00	3-Aug-03	HYRE	0	10	0	900	0	Amphibian resource
	14029.00	12-Jul-01	HYRE	0	0	0	100	0	Amphibian resource
			THEL	2	0	0	0	0	

Table 22, Con't. Summary of herpetofauna survey data and management for Lake Schmidell PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
	14142.00	31-Jul-08	SNYLF	1	1	0	0	0	Not actively managed
	14143.00	31-Jul-08	HYRE	0	0	0	85	0	Amphibian resource
			SNYLF	2	4	0	9	0	
			THSI	4	0	0	0	0	
		4-Aug-03	THEL	2	0	0	0	0	

Table 23. Summary of fish population data for Lake Schmidell PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Clyde Lake	14149.00	31-Jul-08	None					
Doris Lake, Lower	14048.00	11-Jul-01	BK	yes	14	257	194	1.106
			GT	unknown	9	229	140	1.052
Doris Lake, Upper	14051.00	15-Jul-02	BK	yes	36	185	69	0.970
			GT	no	1	105	10	0.864
Lake Schmidell	13968.00	13-Aug-05	BK	yes	38	174	64	1.061
Lois Lake	14014.00	2-Aug-03	BK	yes	37	208	87	0.905
Velma Lake, Middle	13942.00	6-Jul-03	RT	no	9	342	330	0.825

Table 24. Summary of fisheries management information for Lake Schmidell PWS.

Lake Name	Lake ID	First Recorded Stocking	Last Recorded Stocking	Pre-Survey Allotments	Current Proposed Allotment	Management Direction
Clyde Lake	14149.00	1932 - GT 1933 - RT	2000 - GT 1960 - RT	5000 GT ANN	DNP	Amphibian resource
Doris Lake, Lower	14048.00	1937 - BK 1967 - GT	1942 - BK 2000 - GT	500 GT ANN	500 GT ANN	Stocked lake
Doris Lake, Upper	14051.00	1937 - BK 1967 - GT	1942 - BK 2000 - GT	200 GT ANN	200 GT ANN	Stocked lake
Lake Schmidell	13968.00	1935 - BK	1964 - BK	DNP	DNP	Self-sustaining fishery
Lois Lake	14014.00	1937 - BK	1964 - BK	DNP	DNP	Self-sustaining fishery
Velma Lake, Middle	13942.00	1946 - RT	2007 - RT	6000 RT ANN	2000 RT ANN	Stocked lake

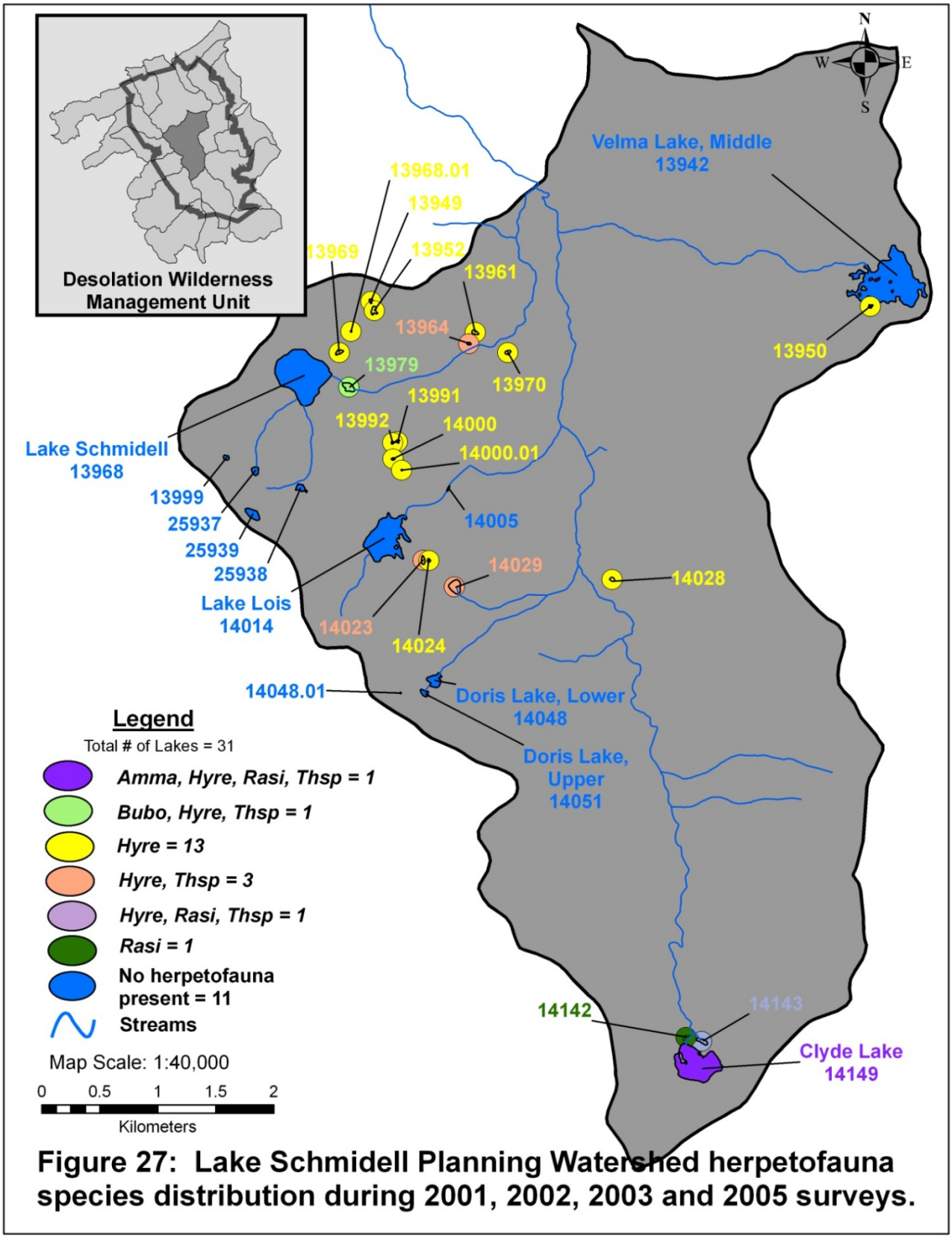

Figure 27: Lake Schmidell Planning Watershed herpetofauna species distribution during 2001, 2002, 2003 and 2005 surveys.

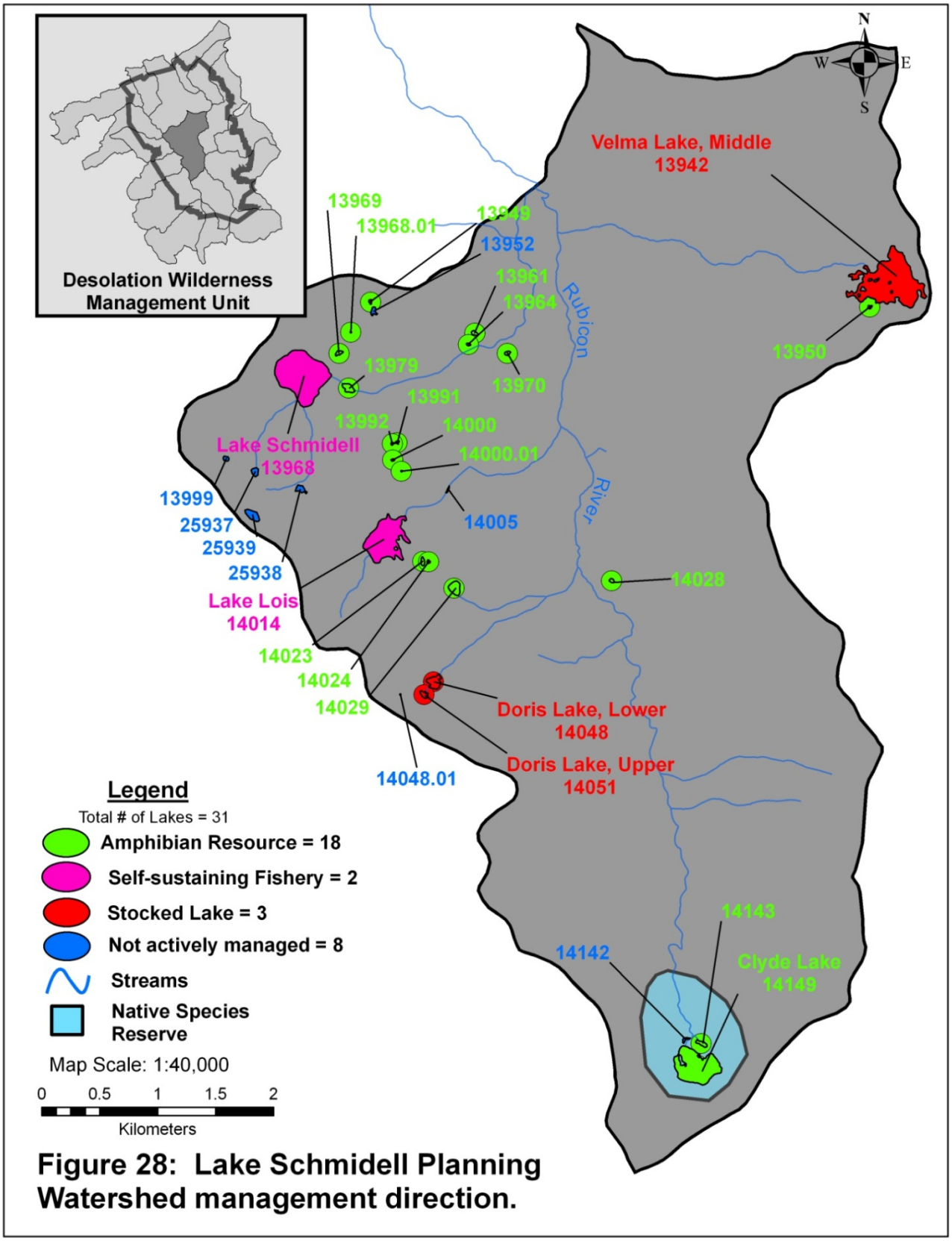

Figure 28: Lake Schmidell Planning Watershed management direction.

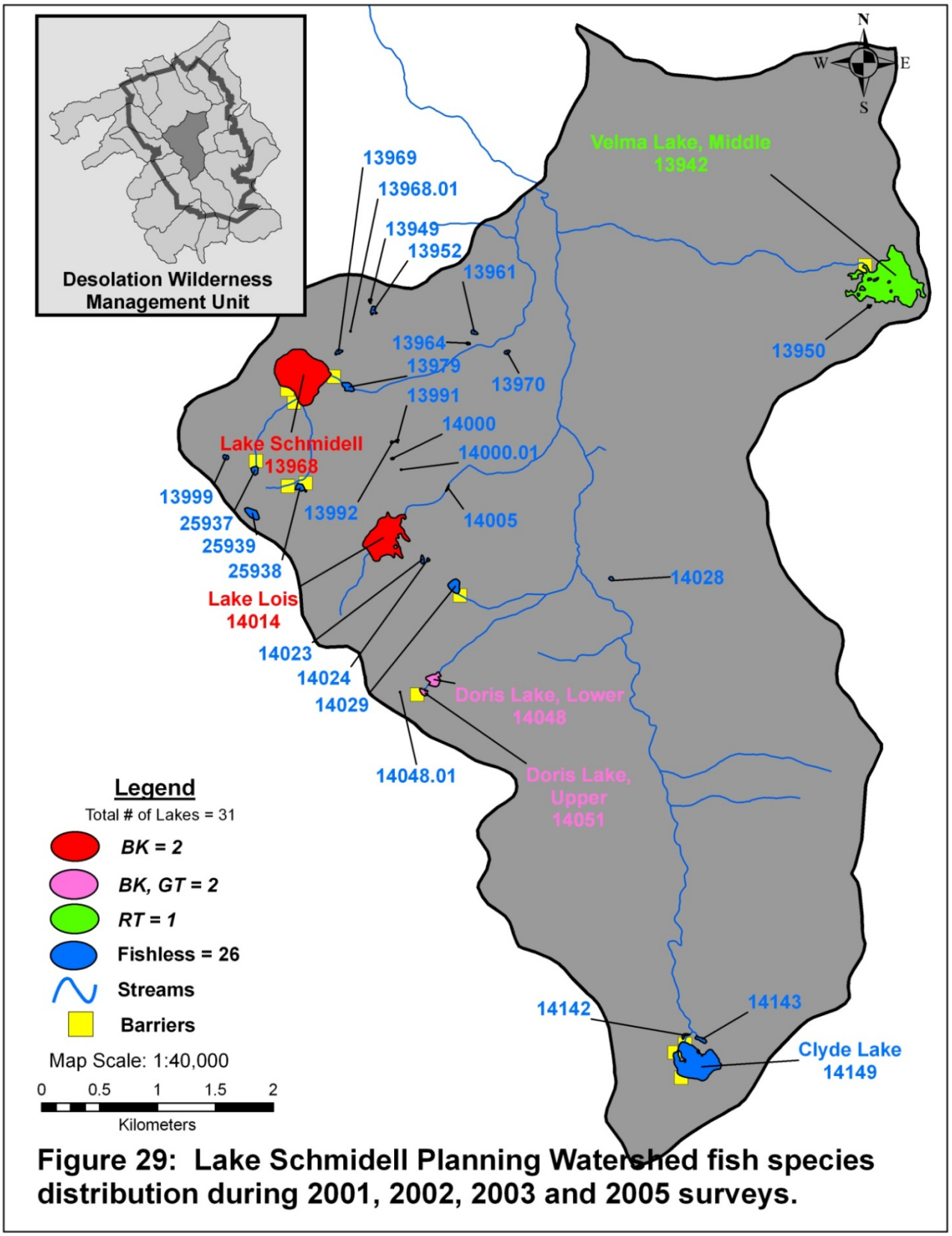

Figure 29: Lake Schmidell Planning Watershed fish species distribution during 2001, 2002, 2003 and 2005 surveys.

9) LAWRENCE LAKE PLANNING WATERSHED MANAGEMENT DIRECTION

Lawrence Lake PWS is located on the western edge of Desolation Wilderness and drains to Union Valley Reservoir and eventually the South Fork American River. Six named lakes and 21 unnamed waters are located within the watershed. Barrett Lake is vehicle-accessible via a rugged OHV trail and at times can experience high visitation. The other destination lakes in the watershed can be accessed via the Red Peak Trail at the end of the Barrett Lake OHV trail or by a trailhead at Van Vleck Ranch.

Table 25 provides summary data for amphibian resources and management in the Lawrence Lake PWS. Table 26 provides a summary of fish population data for the Lawrence Lake PWS. Table 27 provides a summary of fisheries management for the Lawrence Lake PWS. Figure 30 provides herpetofauna species distribution for the Lawrence Lake PWS. Figure 31 provides the management direction for the Lawrence Lake PWS. Figure 32 provides fish species distribution for the Lawrence Lake PWS.

Herpetofauna Resources and Management

SNYLF were observed within the Lawrence Lake PWS during CDFG surveys in the 1990s near Number 9 Lake and along the middle reaches of Bassi Fork Silver Creek northeast of Upper Bassi Ranch (Davidson 1998). However, more recent surveys indicate SNYLF are now locally extinct.

Two adult AMMA were observed by HML field crews at Number 9 Lake. Larvae were previously observed during a 1993 CDFG survey (Davidson 1998) and it is likely the species continues to reproduce at this location. CDFG has no record of the lake ever being stocked and gill net samples indicate the lake is fishless. As a result, the lake will be managed as an amphibian breeding resource. Similarly, larvae and adult life stage AMMA were observed at Lake ID 14061, as a result the unnamed pond will be managed as an amphibian resource.

BUBO adults have been observed at Lawrence Lake during recent and historic surveys and may breed at the lake. More data is needed to positively determine if BUBO utilize Lawrence Lake as a breeding location. However, Lawrence Lake is a brook trout fishery and will not be managed specifically for amphibians since BUBO are not significantly negatively affected by the presence of fish (Kiesecker et al. 1996, Kats et al. 1988, Orizaola and Brana 2006).

Fisheries Resources and Management

Barrett Lake was stocked with brook trout from the 1930s until 1965 when the allotment was shifted to rainbow trout. Stocking was halted altogether in 1972. CDFG HML gill net sampling indicates the brook trout are self-sustaining and a healthy population persists in the lake. CDFG will continue to manage Barrett Lake as a self-sustaining brook trout fishery.

Lawrence Lake has a long history of brook trout stocking dating back to 1934. It was last stocked in 2000 and was sampled with gill nets four years later in 2004. The gill net data indicate that a low density trophy brook trout fishery persists in the absence of stocking. Field crews did witness some evidence of spawning but it is unclear to what extent brook trout are self-sustaining. The lake will be managed as a self-sustaining brook trout fishery and monitored to evaluate if natural reproduction is sufficient to maintain the fishery.

Lost Lake, also known as Gem Lake, was stocked with brook trout from 1931 until 2000. A gill net sample by HML field crews in 2002 returned no fish. The lake is shallow enough to winterkill but additional monitoring is necessary to confidently declare the lake fishless. The lake receives low use and is near other lakes that are better destination fisheries. As a result, stocking will be halted at Lost Lake. If additional monitoring data show the lake to be fishless it will no longer be actively managed by CDFG, otherwise it will be managed as a self-sustaining fishery.

Number 5 Lake was stocked with brook trout from 1934 until 2000. The lake is shallow and marsh-like and although the brook trout grow to decent size, it is not a destination fishery. The lake has little to no spawning habitat and the tributaries are known to go dry by late summer. CDFG expects that the existing brook trout will die off in the absence of stocking. If additional monitoring data show the lake to be fishless it will no longer be actively managed by CDFG, otherwise it will be managed as a self-sustaining fishery.

Top Lake was stocked with brook trout from 1935 until 1964 when the allotment was changed to golden trout. Golden trout were stocked in low numbers up until 1999. According to gill net data and angler reports the brook trout are self-sustaining at a low density. Golden trout have never been strongly expressed in the fishery and it is likely that few of the stocked fingerlings recruit to catchable size. CDFG intends to enhance the golden trout fishery by stocking at or above historic levels.

Table 25. Summary of herpetofauna survey data and management for Lawrence Lake PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
Barrett Lake	14050.00	2-Sep-02	HYRE	4	0	0	0	0	Self-sustaining fishery
Lawrence Lake	14038.00	14-Sep-04	BUBO	1	0	0	0	0	Self-sustaining fishery
			HYRE	2	0	0	0	0	
Lost (Gem) Lake	14043.00	24-Sep-05	HYRE	0	25	0	8	0	Amphibian resource
Number 5 Lake	14020.00	31-Aug-02	None						Not actively managed
Number 9 Lake	14041.00	12-Sep-04	AMMA	2	0	0	0	0	Amphibian resource
		24-Sep-05	HYRE	0	6	2	8	0	
		24-Sep-05	THEL	0	1	0	0	0	
Top Lake	14049.00	12-Sep-04	None						Stocked lake
	13982.00	31-Aug-02	THEL	1	0	0	0	0	Not actively managed
	14026.00	1-Sep-02	HYRE	0	1	0	0	0	Not actively managed
	14036.00	12-Sep-04	HYRE	9	0	0	0	0	Not actively managed
	14039.00	12-Sep-04	HYRE	4	0	3	5	0	Amphibian resource
			THEL	1	0	0	0	0	
	14053.00	1-Sep-02	HYRE	0	10	0	2	0	Amphibian resource
	14061.00	1-Sep-02	AMMA	0	1	0	10	0	Amphibian resource

Table 26. Summary of fish population data for Lawrence Lake PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Barrett Lake	14050.00	2-Sep-02	BK	yes	12	267	196	1.023
Lawrence Lake	14038.00	14-Sep-04	BK		7	297	330	1.171
Lost (Gem) Lake	14043.00	1-Sep-02	None					
Number 5 Lake	14020.00	31-Aug-02	BK	no	6	342	523	1.310
Number 9 Lake	14041.00	12-Sep-04	None					
Top Lake	14049.00	12-Sep-04	BK	yes	5	371	645	1.276

Table 27. Summary of fisheries management information for Lawrence Lake PWS.

Lake Name	Lake ID	First Recorded Stocking	Last Recorded Stocking	Pre-Survey Allotments	Current Proposed Allotment	Management Direction
Barrett Lake	14050.00	1934 - BK 1967 - RT	1965 - BK 1972 - RT	DNP	DNP	Self-sustaining fishery
Lawrence Lake	14038.00	1934 - BK 1983 - RT	2000 - BK 1985 - RT	1000 BK ANN	DNP	Self-sustaining fishery
Lost (Gem) Lake	14043.00	1931 - BK	2000 - BK	500 BK ANN	DNP	Amphibian resource
Number 5 Lake	14020.00	1934 - BK	2000 - BK	500 BK BNE	DNP	Not actively managed
Number 9 Lake	14041.00			DNP	DNP	Amphibian resource
Top Lake	14049.00	1935 - BK 1965 - GT	1964 - BK 1999 - GT	1000 GT ANN	500 GT ANN	Stocked lake

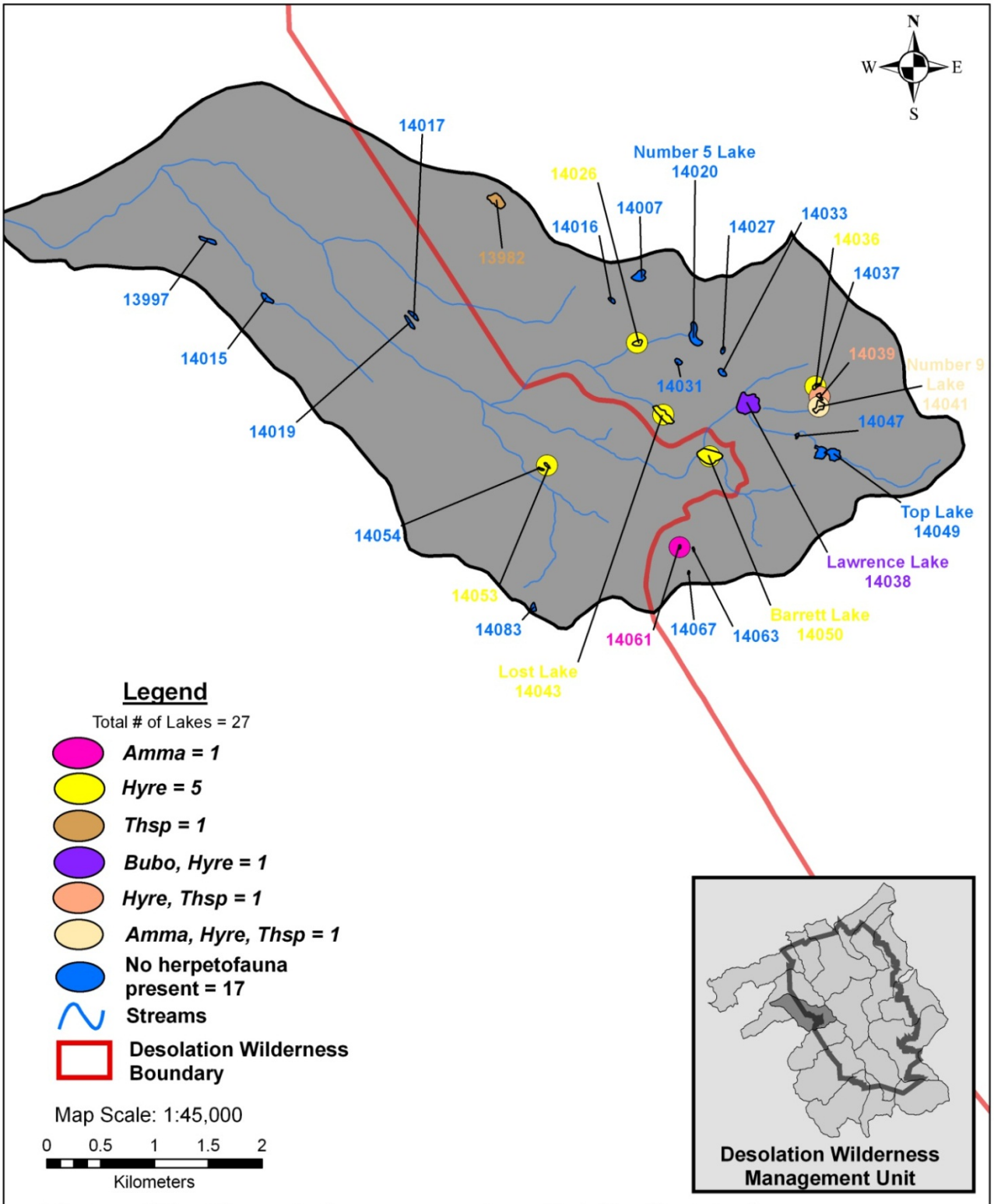

Figure 30: Herpetofauna species distribution in Lawrence Lake Planning Watershed during 2002, 2004 and 2005 surveys.

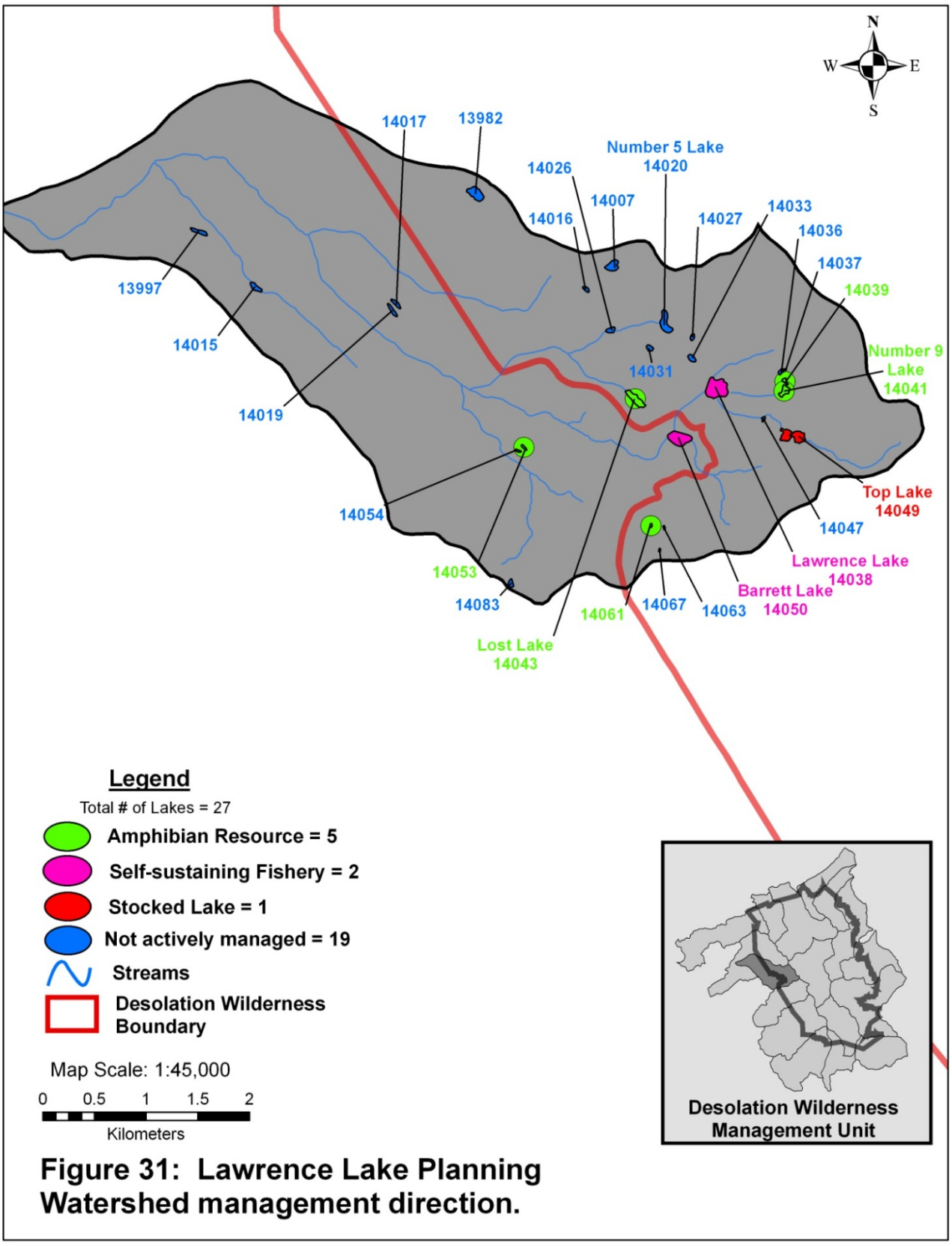

Figure 31: Lawrence Lake Planning Watershed management direction.

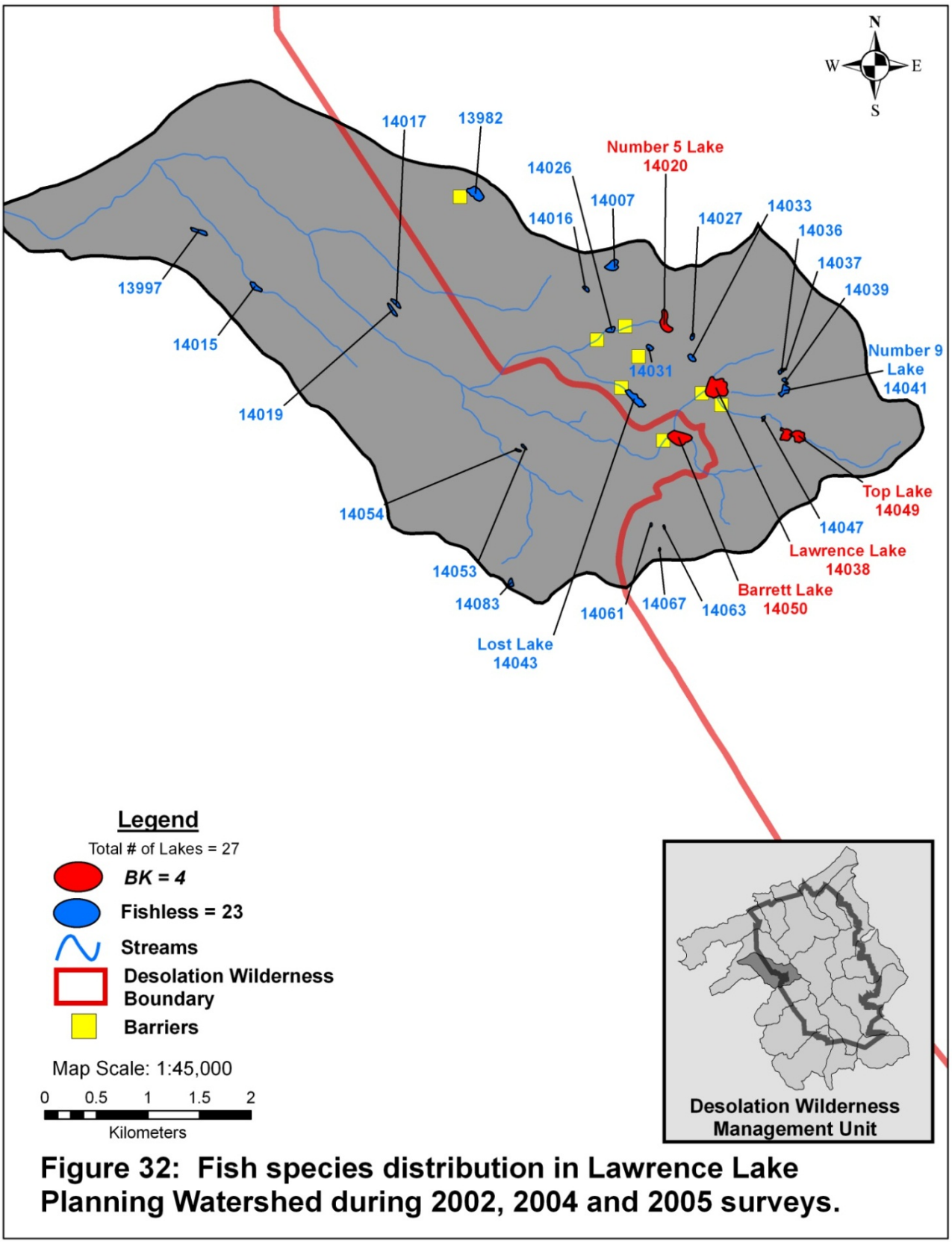

Figure 32: Fish species distribution in Lawrence Lake Planning Watershed during 2002, 2004 and 2005 surveys.

10) LONELY GULCH PLANNING WATERSHED MANAGEMENT DIRECTION

Lonely Gulch PWS includes several creeks draining from the east flank of Desolation Wilderness. However, all of the managed lakes are in the southern portion of the PWS and drain to Lake Tahoe at Emerald Bay over a well-known hydrologic feature, Eagle Falls. Seven named lakes and 31 unnamed waters are found within the PWS, all but two are located in the southern portion of the PWS and within the boundary of Desolation Wilderness. Lake ID 13760 is accessed via private property and is not addressed in this plan. Lake ID 13978 has not been surveyed by CDFG.

Most of the lakes within this PWS are day-hike-accessible from Highway 89 near Emerald Bay via the Eagle Lake Trail or the Bay View Trail. Furthermore, the Pacific Crest Trail passes through the PWS which acts as a primary conduit for multi-day visitors. As a result, the lakes within this PWS receive heavy use and are common destinations for backcountry anglers.

Table 28 provides summary data for amphibian resources and management in the Lonely Gulch PWS. Table 29 provides a summary of fish population data for the Lonely Gulch PWS. Table 30 provides a summary of fisheries management for the Lonely Gulch PWS. Figures 33 and 34 provide herpetofauna species distribution for the Lonely Gulch PWS. Figures 35 and 36 provide the management direction for the Lonely Gulch PWS. Figures 37 and 38 provide fish species distribution for the Lonely Gulch PWS.

Herpetofauna Resources and Management

No SNYLF populations have been observed within the Lonely Gulch PWS during HML surveys and CDFG is unaware of any historic observations.

AMMA larvae were observed at Lake ID 14001 in 1997 by Forest Service personnel. CDFG field crews did not detect this species during a 2003 survey, but it is likely the species still utilizes this pond for breeding. As a result, the unnamed pond will be managed as an amphibian breeding resource.

Fisheries Resources and Management

Dicks Lake is a large lake with self-sustaining brook trout that forms the headwaters of Eagle Creek. It was originally stocked with brook trout and rainbow trout in the early 1930s but stocking was halted in 1981. It has been managed as a self-sustaining fishery since that time. 2003 gill net data indicate brook trout of multiple size classes persist. The lake will not be stocked again and will continue to be managed as a self-sustaining fishery.

Eagle Lake (Photo 11) is one of the most visited lakes within Desolation Wilderness due to its proximity to the popular trailhead at Eagle Falls and its picturesque setting (Fig. 2). It was historically stocked with brook trout until 1934.

Numerous other species were introduced throughout subsequent decades including brown trout, cutthroat trout, and rainbow trout. Rainbow trout stocking continued until 2000, however gill net surveys in 1986 found very few rainbow trout and 2003 gill net data showed none. Brook trout and brown trout, however, are self-sustaining within the lake and are likely supplemented with immigration from upstream sources. The lake is difficult to fish from the trail along the shoreline. However anglers have reported good success catching brown trout using float tubes to access the opposite shoreline and inlet. The lack of stocking has not adversely affected the fishery and CDFG will manage this lake as a self-sustaining fishery.

Fontanilis Lake is along the Pacific Crest Trail and receives heavy visitation. It was stocked with brook trout from 1933 until 1979 and recent gill net data indicate that multiple size classes of brook trout persist. Brown trout and rainbow trout have shown up in angler surveys and gill net surveys, however, CDFG has no record of these species ever being stocked in Fontanilis Lake or nearby Dicks Lake which lies upstream. CDFG will continue to manage Fontanilis Lake as a self-sustaining brook trout fishery.

Photo 11: Eagle Lake looking west (1949 J.C. Fraser, CDFG)

Lower and Upper Grouse lakes have been stocked with brook trout since the 1930s and were last stocked in 1998 and 1996, respectively. Gill net data from 2003 show that brook trout persist in both lakes and evidence of reproduction was seen in Lower Grouse Lake. It is unclear if Upper Grouse Lake is self-sustaining although ample spawning gravel is available in the inlet and outlet. Unlike the other lakes in Lonely Gulch PWS, the Grouse lakes are accessed from the Meeks Creek Trail near Phipps Pass and are the most remote lakes in the

PWS, at least eight miles from a trailhead. Stocking will not be resumed at either lake until data can be collected that provides better resolution of the brook trout population. At that time, if management objectives warrant renewed stocking, Lahontan cutthroat trout will be considered to extend this species' range within its native watershed.

Lower Velma Lake is a popular angling location but receives less overnight use than the lakes just upstream and further up the trail. It was stocked with rainbow trout from 1937 until 1956 and has not been stocked by CDFG since. Despite the relatively short stocking history, gill net surveys and angler reports indicate self-sustaining populations of brook trout, rainbow trout and brown trout. In light of these data, it appears the lake has been properly managed as a self-sustaining fishery for over 50 years and will continue to be managed as such.

Upper Velma Lake (Photo 12) has a similar management history. It was stocked with brook trout from 1936 to 1942. In 1944 the allotment was shifted to rainbow trout and was stocked until 1972. Recent gill net data and angler reports indicate brook trout persist within the lake. It is unclear if rainbow trout are self-sustaining within the lake although they are certainly self-sustaining throughout the larger system of lakes and connecting streams. This fishery is healthy and productive without additional stocking and will continue to be managed as a self-sustaining fishery.

Photo 12: Upper Velma Lake looking north by north east (1953 C.K. Fisher, CDFG)

Lake ID 13962 is a large unnamed lake immediately downstream of Upper Velma Lake. CDFG has no record of fish ever being stocked in the lake however multiple species of trout are known to be present based upon angler reports.

HML field crews did not set gill nets to sample fish populations within the lake so little is known about the population structure. Due to the proximity to Upper Velma Lake and the lack of fish barriers it is likely the fish population is very similar to the larger lake. Lake ID 13962 will be managed by CDFG as a self-sustaining fishery.

Lake ID 14008 is a large unnamed lake just upstream of Fontanilis Lake. It was stocked by CDFG with low numbers of brook trout from 1969 to 1993. Gill net data collected in 2003 returned a single rainbow trout and no brook trout. Additional monitoring is necessary to determine the true nature of the fishery at this lake. In the meantime, the lake will be managed as a self-sustaining fishery until additional data warrants different management.

Lake ID 14030 is a small unnamed lake that was initially stocked in 1962 with brook trout. According to CDFG records, brook trout were never stocked again although golden trout were stocked from 1966 to 1980. Gill net surveys conducted in 2003 show that brook trout persist and reproduce naturally in the lake. There is no evidence that golden trout have survived since the last stocking event in 1980. The lake will not be stocked in the future and it will be managed as a self-sustaining brook trout fishery.

Table 28. Summary of herpetofauna survey data and management for Lonely Gulch PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
Dicks Lake	14022.00	7-Jul-03	THSI	1	0	0	0	0	Self-sustaining fishery
Eagle Lake	13930.00	5-Aug-03	None						Self-sustaining fishery
Fontanilis Lake	13990.00	8-Jul-03	None						Self-sustaining fishery
Grouse Lake, Lower	13905.00	22-Jul-03	HYRE	0	0	0	19	0	Self-sustaining fishery
Grouse Lake, Upper	13895.00	22-Jul-03	HYRE	0	0	0	79	0	Self-sustaining fishery
Velma Lake, Lower	13937.00	3-Jul-03	THCO	2	0	0	0	0	Self-sustaining fishery
Velma Lake, Upper	13977.00	5-Jul-03	HYRE	0	0	0	0	2	Self-sustaining fishery
			THCO	1	0	0	0	0	
	13945.00	3-Jul-03	HYRE	0	0	0	0	4	Amphibian resource
	13948.00	3-Jul-03	HYRE	0	0	0	0	15	Amphibian resource
	13953.00	4-Jul-03	HYRE	0	0	0	22	4	Amphibian resource
	13953.01	4-Jul-03	HYRE	0	0	0	425	6	Amphibian resource
	13954.00	5-Aug-03	HYRE	0	0	0	40	0	Amphibian resource
			THEL	1	0	0	0	0	
	13957.00	4-Jul-03	HYRE	0	0	0	0	2	Amphibian resource
	13962.00	5-Jul-03	HYRE	0	0	0	0	0	Self-sustaining fishery
			THCO	3	0	0	0	0	
	13963.00	4-Jul-03	HYRE	0	0	0	0	3	Amphibian resource
	13971.00	5-Jul-03	HYRE	0	0	0	1	0	Not actively managed
	14001.00	9-Jul-03	HYRE	0	0	0	70	2	Amphibian resource
	14010.00	8-Jul-03	HYRE	0	0	0	0	6	Amphibian resource

Table 29. Summary of fish population data for Lonely Gulch PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Dicks Lake	14022.00	7-Jul-03	BK	yes	31	210	80	0.807
Eagle Lake	13930.00	5-Aug-03	BK	yes	7	228	137	1.085
			BN	yes	4	221	153	1.138
Fontanilis Lake	13990.00	8-Jul-03	BK	yes	16	216	117	0.979
			RT	yes	2	307	280	0.969
Grouse Lake, Lower	13905.00	22-Jul-03	BK	yes	5	309	375	1.122
Grouse Lake, Upper	13895.00	22-Jul-03	BK	yes	5	428	863	1.100

Table 29, Con't. Summary of fish population data for Lonely Gulch PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Velma Lake, Lower	13937.00	3-Jul-03	BK	yes	10	314	327	1.047
			BN	yes	1	335	328	0.872
			RT	yes	4	346	406	0.963
Velma Lake, Upper	13977.00	5-Jul-03	BK	yes	13	247	139	0.910
	14008.00	8-Jul-03	RT	yes	1			
	14030.00	7-Jul-03	BK	yes	16	200	72	0.883

Table 30. Summary of fisheries management information for Lonely Gulch PWS.

Lake Name	Lake ID	First Recorded Stocking	Last Recorded Stocking	Pre-Survey Allotments	Current Proposed Allotment	Management Direction
Dicks Lake	14022.00	1932 - BK 1931 - RT	1976 - BK 1981 - RT	DNP	DNP	Self-sustaining fishery
Eagle Lake	13930.00	1930 - BK 1937 - BN 1939 - RT	1937 - BK 1938 - BN 2000 - RT	5000 RT ANN	DNP	Self-sustaining fishery
Fontanilis Lake	13990.00	1933 - BK	1979 - BK	DNP	DNP	Self-sustaining fishery
Grouse Lake, Lower	13905.00	1934 - BK 1932 - RT	1998 - BK 1974 - RT	DNP	DNP	Self-sustaining fishery
Grouse Lake, Upper	13895.00	1941 - BK 1966 - RT	1996 - BK 1971 - RT	DNP	DNP	Self-sustaining fishery
Velma Lake, Lower	13937.00	1937 - BK 1936 - RT	1937 - BK 1956 - RT	DNP	DNP	Self-sustaining fishery
Velma Lake, Upper	13977.00	1936 - BK 1944 - RT	1942 - BK 1972 - RT	DNP	DNP	Self-sustaining fishery
	14008.00	1969 - BK	1993 - BK			Self-sustaining fishery
	14030.00	1962 - BK 1966 - GT	1962 - BK 1980 - GT	DNP	DNP	Self-sustaining fishery

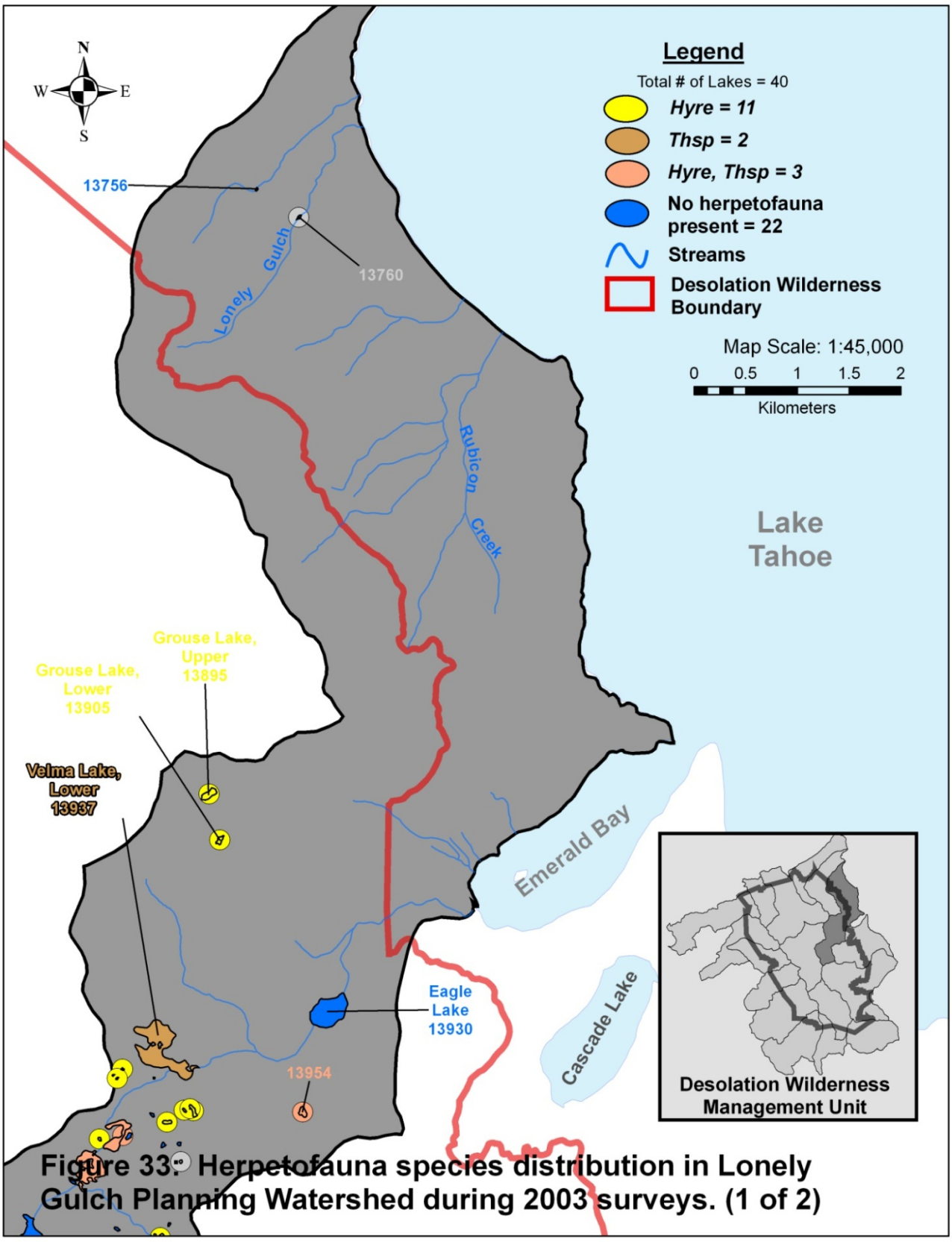

Figure 33: Herpetofauna species distribution in Lonely Gulch Planning Watershed during 2003 surveys. (1 of 2)

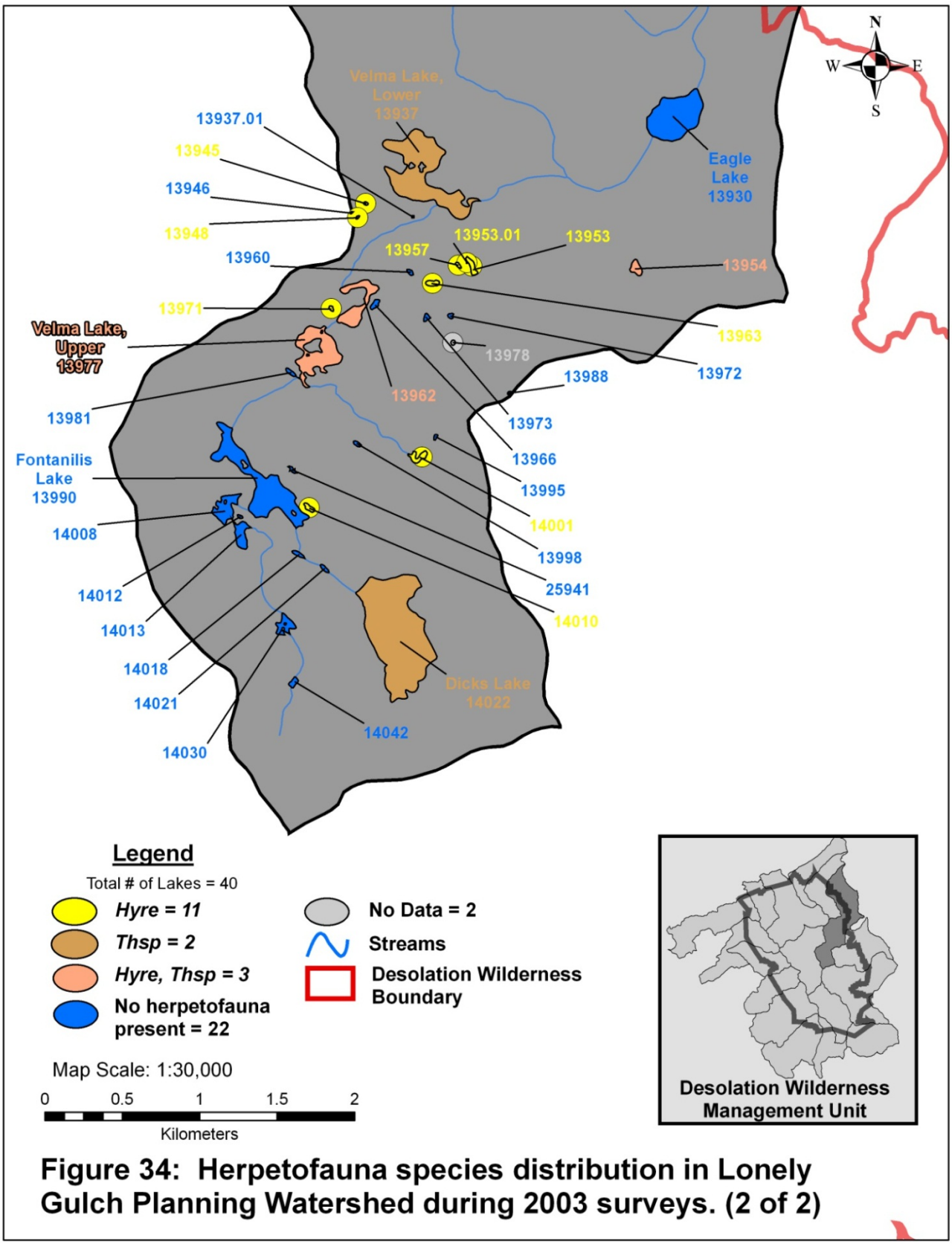

Figure 34: Herpetofauna species distribution in Lonely Gulch Planning Watershed during 2003 surveys. (2 of 2)

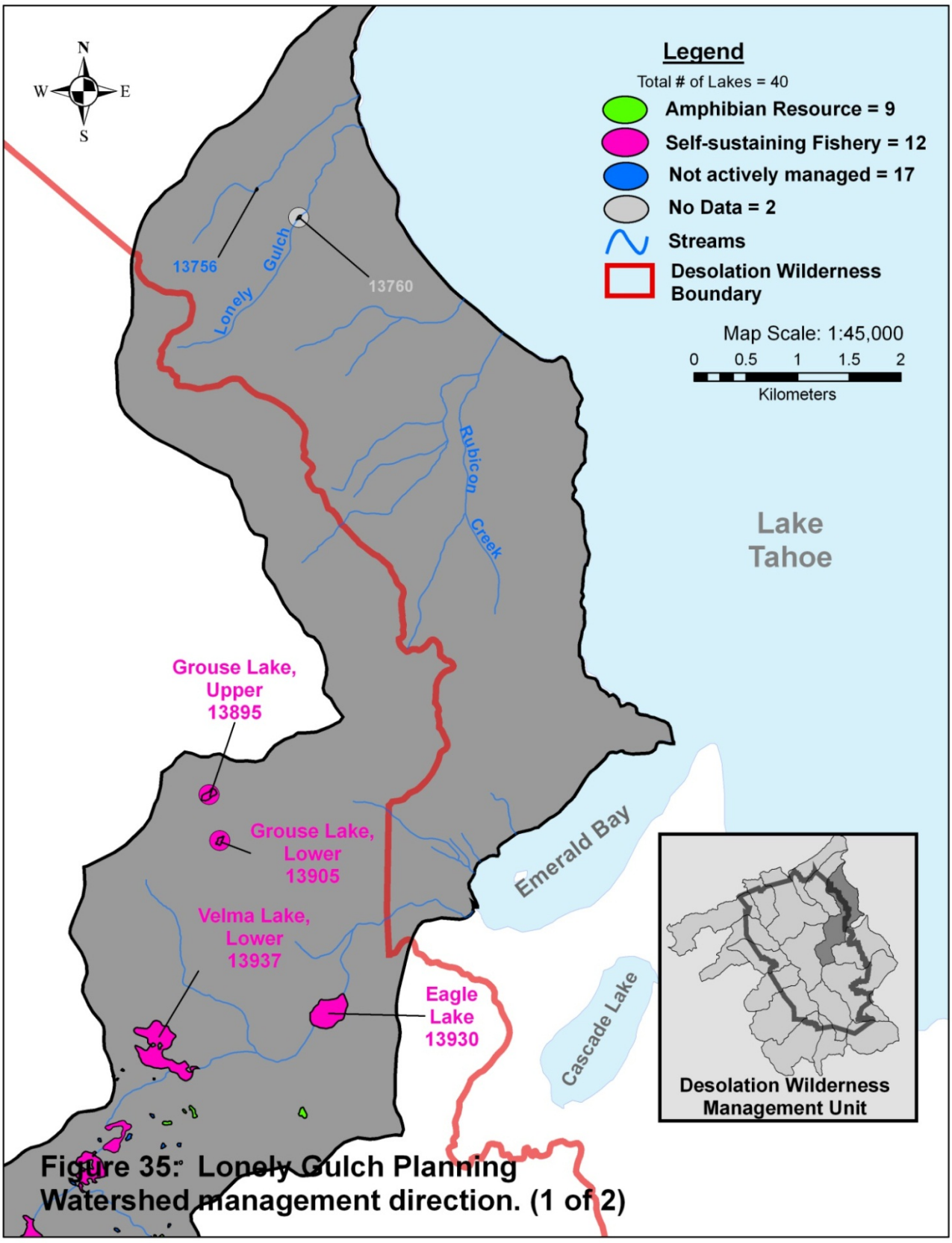

Figure 35: Lonely Gulch Planning Watershed management direction. (1 of 2)

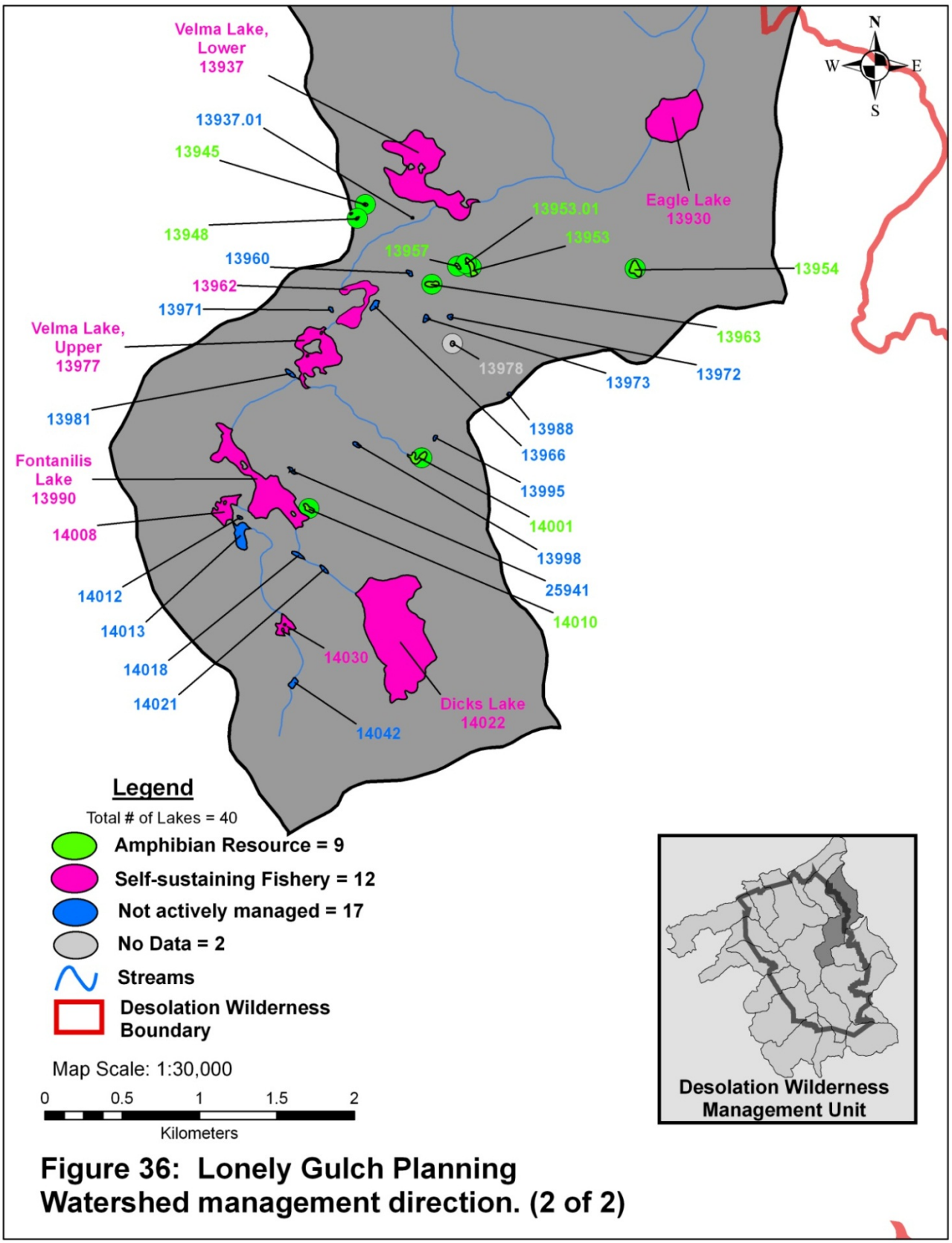

Figure 36: Lonely Gulch Planning Watershed management direction. (2 of 2)

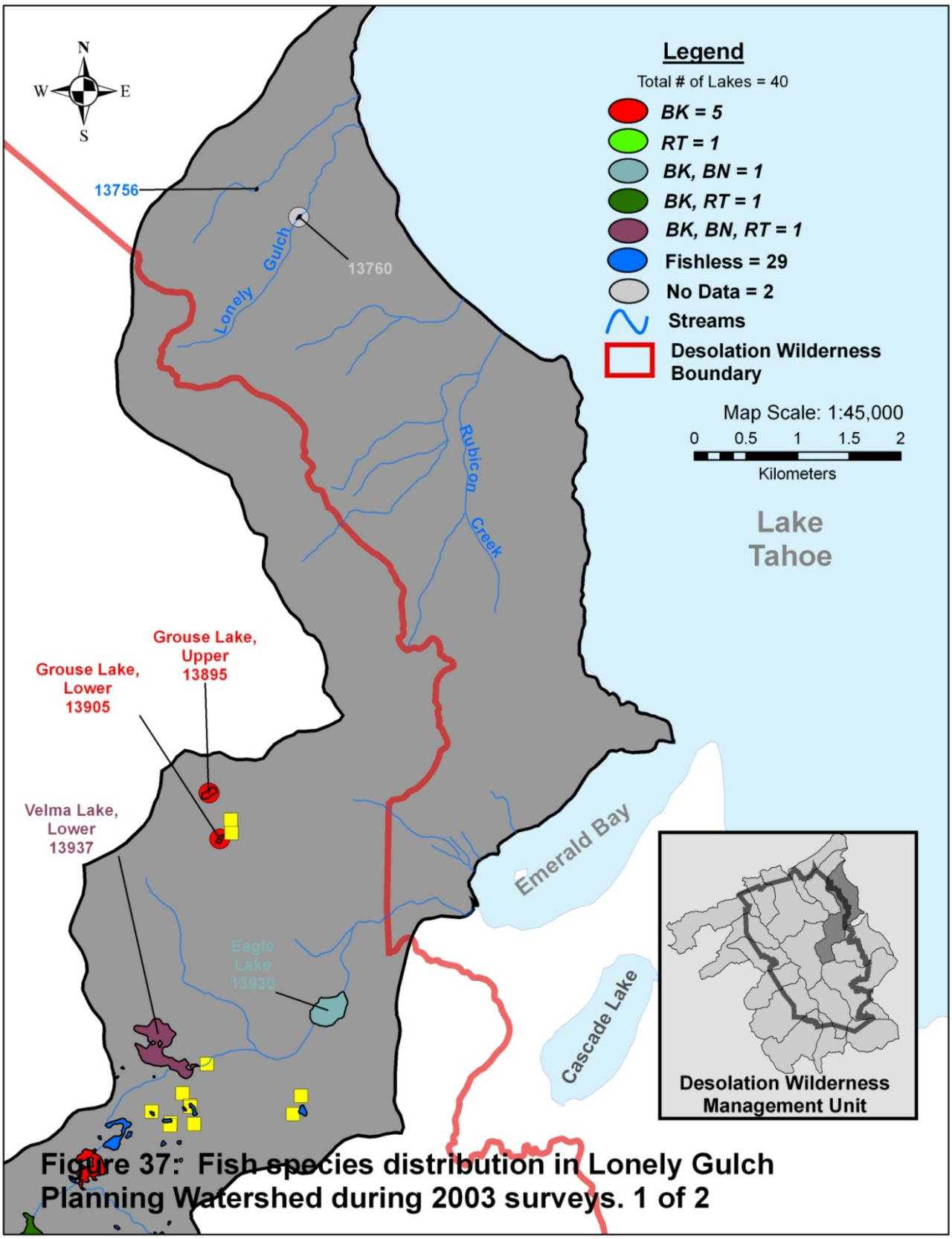

Figure 37: Fish species distribution in Lonely Gulch Planning Watershed during 2003 surveys. 1 of 2

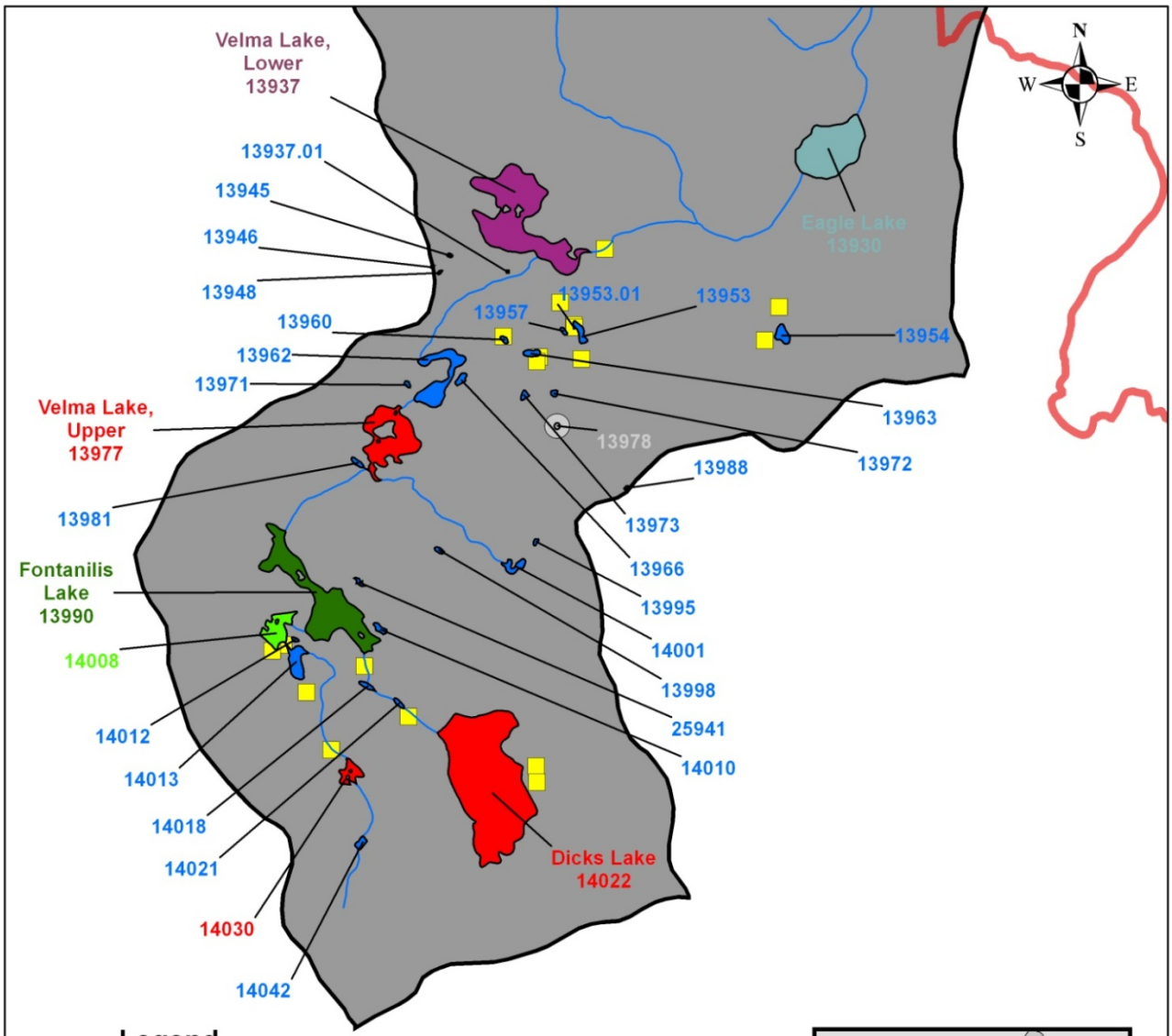

Figure 38: Fish species distribution in Lonely Gulch Planning Watershed during 2003 surveys. (2 of 2)

11) LYONS CREEK PLANNING WATERSHED MANAGEMENT DIRECTION

Lyons Creek PWS includes Lyons Creek and the headwaters of South Fork Silver Creek. Both creeks are part of the South Fork American River watershed and drain west from Desolation Wilderness to Icehouse Reservoir. Sixteen named lakes and 35 unnamed waters are found within the PWS. Wrights Lake and Beauty Lake are both road-accessible front country water bodies and are not addressed in this plan. Bloodsucker Lake is located on private property and is not managed by CDFG. Lake ID 14344 has not been surveyed by CDFG and is not addressed in this plan.

Wrights Lake and Beauty Lake are accessible via Wrights Lake Road from Highway 50. The majority of backcountry water bodies in this PWS are accessible from Wrights Lake Road via the Twin Lakes Trail and the Lyons Creek Trail. Both trails are relatively short and are used frequently by day trip and multi-day visitors.

Table 31 provides summary data for amphibian resources and management in the Lyons Creek PWS. Table 32 provides a summary of fish population data for the Lyons Creek PWS. Table 33 provides a summary of fisheries management for the Lyons Creek PWS. Figure 39 provides herpetofauna species distribution for the Lyons Creek PWS. Figure 40 provides the management direction for the Lyons Creek PWS. Figure 41 provides fish species distribution for the Lyons Creek PWS.

Herpetofauna Resources and Management

Two small SNYLF populations were found within the Lyons Creek PWS. Herpetofauna were observed at a total of 14 sites by HML field crews. No other special status amphibian species were observed within Lyons Creek PWS by CDFG, nor does CDFG have any record of historic sightings.

Pyramid Peak Lake and Lake ID 14299 support breeding SNYLF and will be managed as a native species reserve. A significant barrier isolates the two tarns from fish occupied aquatic habitat downstream. However, below this barrier there is no opportunity to expand the native species reserve and reclaim downstream habitat for native species. Pyramid Peak Lake was stocked with golden trout between 1965 and 1988. Recent gill net data indicate golden trout have not persisted without active stocking. The loss of this fishery is a negligible negative effect on recreational angling opportunity. The two lakes are remote and only accessible via cross country travel thus receive very little visitation. This is one of two SNYLF populations in the Desolation Wilderness which were negative for Bd during CDFG's 2008 baseline assessment.

The second SNYLF population within Lyons Creek PWS is located in Boomerang Lake and unnamed ponds in the vicinity of Twin lakes and Island Lake. Larval

SNYLF have been observed at Boomerang Lake, Lake ID 14150, Lake ID 14166.01, Lake ID 14182, Lake ID 14196, and Lake ID 14196.01. However, Boomerang Lake and Lake ID 14196 are the only sites of significant depth with consistent observations of SNYLF. Adult and sub-adult life stages have been observed at most water bodies within the basin including the trout-bearing lakes. It is likely that trout within Twin lakes and Island Lake substantially negatively affect survival of sub-adult SNYLF. As a result, the entire upper basin has been identified as a native species reserve and stocking has been halted. Island Lake, Lower Twin Lake, Upper Twin Lake and Lake ID 14177 support self-sustaining brook trout and have been identified as potential fish removal sites. However, due to the lack of suitable fish barriers, interconnectivity of trout-bearing lakes, and length and complexity of tributaries, fish removal is not feasible using mechanical techniques. Island Lake exhibits the least of these deterrents but successful fish removal will likely require active willow removal and/or chemical treatment of two inlets and the outlet. As a result, the lakes will continue to be managed as self-sustaining fisheries until such time that conditions change and fish removal becomes feasible.

Dry Lake is very shallow and likely ephemeral. It would make poor trout habitat and CDFG has no record of it ever being stocked. The lake will be managed for native aquatic species and will not be stocked in the future.

Photo 13: Umpa Lake (2008 Anthony Oldefredi, CDFG)

Smith Lake is a trail-accessible cirque lake (glacier-formed sloping bowl) with self-sustaining brook trout. USFS reports indicate Mount Lyell salamanders (*Hydromantes platycephalus*) are present in the talus fields surrounding Smith Lake, the only known occurrence of this species on the Eldorado National Forest. As a result, the lake will continue to be managed as a self-sustaining fishery and will not be stocked in the future.

Umpa Lake (Photo 13) is off trail and isolated from nearby fish-bearing waters. CDFG has no record of the lake ever being stocked and it is likely that the lake is fishless. A gill net survey has not been conducted at Umpa Lake. Further monitoring is necessary to validate the absence of fish. If fishless, the lake represents an opportunity to expand SNYLF within Lyons Creek PWS by introducing multiple cohorts of larvae from the breeding locations at Boomerang Lake and Lake ID 14196.

Fisheries Resources and Management

Hemlock Lake has been stocked with brook trout since 1935. It was last stocked in 2000 and a gill net sample in 2008 indicates that brook trout persist in the absence of stocking. The lake is trail-accessible but is small and is not a destination fishing location. As a result, the lake will no longer be stocked and will be managed as a self-sustaining fishery.

Island Lake was stocked with brook trout from 1932 to 1965 and with golden trout from 1970 to 1980. CDFG gill net samples conducted in 2004, 2008 and 2009 show a healthy, self-sustaining brook trout population persists in the absence of stocking. However, the golden trout were not self-sustaining and have never been captured in a gill net survey. The lake is adjacent to breeding SNYLF and larvae have been found in associated ponds. As a result, Island Lake has been identified as a fish removal site but the complexity of the outlet and several inlets may require the use of chemical treatment, vegetation removal and/or electro-fishing to remove trout. Therefore, the lake will be managed as a self-sustaining brook trout fishery until such time that fish removal is feasible.

Grouse Lake has been stocked with brook trout from 1934 until 1985 and rainbow trout from 1930 to 2000. The brook trout have established a naturally reproducing population, but gill net data show rainbow trout have disappeared in the absence of stocking. The brook trout are healthy but small (< 130 mm; < 5 inches) and the lake is not popular as a destination fishery. Therefore, stocking will be halted and the lake will be managed as a self-sustaining brook trout fishery.

Lyons Lake has been stocked with rainbow trout and brook trout since the mid-1930s. Rainbow trout were last stocked in 1970 but brook trout were stocked annually until 1999. CDFG surveys in 2005 and angling reports indicate the brook trout are self-sustaining. The fish population is thriving without stocking

therefore the lake will be managed as a self-sustaining brook trout fishery and will no longer be stocked.

Secret Lake was stocked with brook trout from 1970 to 1994. CDFG surveys conducted in 2001 caught no fish. However angler reports indicate that brook trout may still persist. Further monitoring is necessary to determine if brook trout are self-sustaining at this lake. In either case, the lake will not be stocked again and will either be managed as a self-sustaining fishery or managed for native aquatic species as a fishless water body.

Smith Lake was stocked with brook trout from 1940 to 1964. Recent surveys demonstrate the brook trout are naturally reproducing and abundant. CDFG will continue to manage this lake as a self-sustaining brook trout fishery.

Sylvia Lake was stocked with brook trout from 1935 to 2000. Although surveys in the 1950s and 1960s report very poor or limited spawning habitat, HML gill net data and angling reports indicate that brook trout are self-sustaining and abundant. Stocking will be halted and the lake will be managed as a self-sustaining brook trout fishery.

Photo 14: Twin lakes looking west (1949 J.C. Fraser, CDFG)

Upper and Lower Twin lakes (Photo 14) were stocked with brook trout from 1932 until 1970 and 1976, respectively, when allotments were shifted to rainbow trout. Rainbow trout stocking continued until 1997. Recent HML surveys show abundant and naturally reproducing brook trout occupy both lakes but only a single rainbow trout was observed. Fish can freely move between the two lakes

and likely have access to the outlet stream below Lower Twin Lake. Individual SNYLF adults have been observed at the lakes but there is no evidence of breeding. CDFG believes the lakes are a source of predation upon sub-adult SNYLF dispersing from over-wintering habitat. As a result, the Twin lakes have been identified as fish removal sites. However, Island Lake and Lake ID 14177 are upstream brook trout waters that would need to be eradicated before Twin lakes fish removal could be successful. Moreover, trout can likely move between Twin lakes and the outlet stream of Lower Twin Lake. The outlet stream is sufficiently complicated that mechanical fish removal would not be successful and chemical treatment would be necessary to ensure fish eradication. As a result of these complications, the lakes will be managed indefinitely as a self-sustaining brook trout fishery until such time that fish removal is feasible.

Lake ID 14177 is an unnamed pond between Island Lake and Upper Twin Lake. Brook trout are present within the pond and may have flushed downstream from Island Lake. It is unclear whether brook trout naturally reproduce within the pond or if the presence of trout is maintained by immigration from Island Lake. The unnamed pond will be managed as a self-sustaining brook trout fishery. Any fish removal effort at Twin lakes would necessitate removing fish from Lake ID 14177 which is upstream of and flows into Upper Twin Lake.

Table 31. Summary of herpetofauna survey data and management for Lyons Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
Boomerang Lake	14185.00	27-Aug-04	THEL	1	0	0	0	0	Amphibian resource
		17-Jul-08	SNYLF	0	1	0	0	0	
		17-Jul-08	THSI	1	0	0	0	0	
Dry Lake	14403.00	31-Aug-04	HYRE	125	0	0	0	0	Amphibian resource
			THSI	1	1	0	0	0	
Grouse Lake	14263.00	2-Jul-01	None						Self-sustaining fishery
Hemlock Lake	14238.00	3-Jul-01	None						Self-sustaining fishery
Island Lake	14145.00	17-Jul-08	None						Native species restoration - Category 3
Pyramid Peak Lake	14311.00	30-Jul-08	SNYLF	3	1	0	22	0	Amphibian resource
		10-Sep-04	THEL	1	0	0	0	0	
Secret Lake	14289.00	14-Jul-01	None						Not actively managed
Smith Lake	14259.00	2-Jul-01	None						Self-sustaining fishery
Sylvia Lake	14331.00	26-Aug-04	HYRE	1	0	0	0	0	Self-sustaining fishery
		28-Jul-05	THEL	1	0	0	0	0	
Twin Lake, Lower	14200.00	17-Jul-08	None						Native species restoration - Category 3
Twin Lake, Upper	14197.00	17-Jul-08	None						Native species restoration - Category 3
Umpa Lake	14188.00	17-Jul-08	HYRE	0	0	0	9	0	Amphibian resource
		30-Jul-05	THEL	1	0	0	0	0	
	14150.00	30-Jul-05	THEL	3	5	0	0	0	Not actively managed
			SNYLF	0	0	0	48	0	
	14166.00	17-Jul-08	HYRE	0	0	0	5	0	Not actively managed
	14166.01	17-Jul-08	HYRE	0	0	0	136	104	Amphibian resource
		30-Jul-05	SNYLF	0	0	0	28	83	
			THEL	0	1	0	0	0	
	14177.01	27-Aug-04	SNYLF	1	0	0	0	0	Not actively managed

Table 31, Con't. Summary of herpetofauna survey data and management for Lyons Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
	14182.00	5-Jul-01	THEL	0	1	0	0	0	Amphibian resource
		17-Jul-08	HYRE	0	0	0	1	0	
			SNYLF	0	1	0	0	0	
			THSI	1	0	0	0	0	
	14187.00	17-Jul-08	HYRE	0	4	0	0	0	Not actively managed
		29-Jul-05	SNYLF	1	0	0	0	0	
	14194.00	17-Jul-08	HYRE	0	0	0	62	0	Amphibian resource
		30-Jul-05	SNYLF	1	0	0	0	0	
		5-Jul-01	THEL	0	1	0	0	0	
	14196.00	9-Aug-08	SNYLF	1	0	0	0	0	Amphibian resource
		17-Jul-08	THEL	2	0	0	0	0	
	14196.01	17-Jul-08	SNYLF	0	0	0	1	0	Amphibian resource
	14201.00	17-Jul-08	SNYLF	2	0	0	0	0	Not actively managed
	14201.01	17-Jul-08	SNYLF	5	0	0	0	0	Amphibian resource
	14275.00	3-Jul-01	HYRE	0	0	0	1000	0	Amphibian resource
	14299.00	30-Jul-08	SNYLF	0	0	0	65	0	Amphibian resource
		10-Sep-04	THEL	0	1	0	0	0	
	14381.00	28-Aug-04	HYRE	1	0	0	0	0	Not actively managed
	14395.00	28-Aug-04	HYRE	130	0	0	0	0	Not actively managed

Table 32. Summary of fish population data for Lyons Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Boomerang Lake	14185.00	6-Sep-02	None					
Dry Lake	14403.00	31-Aug-04	None					
Grouse Lake	14263.00	22-Jul-08	BK	yes	13	129	24	1.032
Hemlock Lake	14238.00	22-Jul-08	BK	yes	7	148	40	1.194
Island Lake	14145.00	17-Jul-08	BK	yes	6	227	123	1.029
Lyons Lake	14297.00	27-Aug-04	BK	yes	16	280	194	0.867
Pyramid Peak Lake	14311.00	5-Sep-02	None					
Secret Lake	14289.00	4-Jul-01	None					
Smith Lake	14259.00	22-Jul-08	BK	yes	5	144	36	1.131
Sylvia Lake	14331.00	26-Aug-04	BK	yes	17	183	63	0.994

Table 32, Con't. Summary of fish population data for Lyons Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Twin Lake, Lower	14200.00	17-Jul-08	BK	yes	51	169	51	0.928
Twin Lake, Upper	14197.00	17-Jul-08	BK	yes	28	170	58	0.998
Umpa Lake	14188.00	27-Aug-04	None					
	14177.00	5-Jul-01	BK					

Table 33. Summary of fisheries management information for Lyons Creek PWS.

Lake Name	Lake ID	First Recorded Stocking	Last Recorded Stocking	Pre-Survey Allotments	Current Proposed Allotment	Management Direction
Boomerang Lake	14185.00	1932 - BK	1951 - BK	DNP	DNP	Amphibian resource
Dry Lake	14403.00			DNP	DNP	Amphibian resource
Grouse Lake	14263.00	1934 - BK 1930 - RT	1985 - BK 2000 - RT	500 RT ANN	DNP	Self-sustaining fishery
Hemlock Lake	14238.00	1935 - BK	2000 - BK	250 BK ANN	DNP	Self-sustaining fishery
Island Lake	14145.00	1932 - BK 1970 - GT	1965 - BK 1980 - GT	DNP	DNP	Native species restoration - Category 3
Lyons Lake	14297.00	1934 - BK 1935 - RT	1999 - BK 1970 - RT	1000 BK ANN	DNP	Self-sustaining fishery
Pyramid Peak Lake	14311.00	1965 - GT	1988 - GT	DNP	DNP	Amphibian resource
Secret Lake	14289.00	1970 - BK	1994 - BK	DNP	DNP	Not actively managed
Smith Lake	14259.00	1940 - BK	1964 - BK	DNP	DNP	Self-sustaining fishery
Sylvia Lake	14331.00	1935 - BK	2000 - BK	500 BK ANN	DNP	Self-sustaining fishery
Twin Lake, Lower	14200.00	1932 - BK 1968 - RT	1976 - BK 1997 - RT	1000 RT ANN	DNP	Native species restoration - Category 3
Twin Lake, Upper	14197.00	1932 - BK 1971 - RT	1970 - BK 1997 - RT	1000 RT ANN	DNP	Native species restoration - Category 3
Umpa Lake	14188.00			DNP	DNP	Amphibian resource
	14177.00					Native species restoration - Category 3

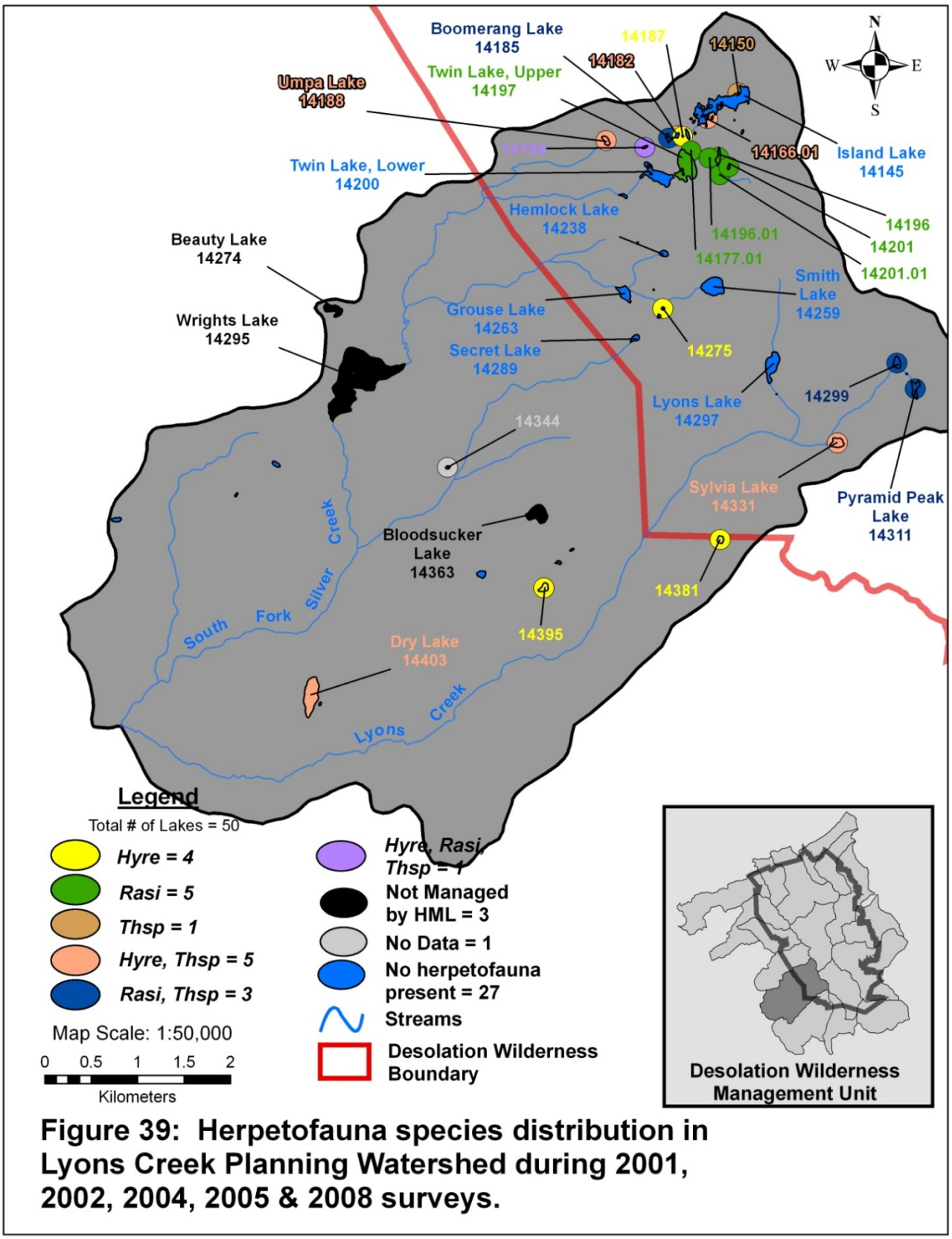

Figure 39: Herpetofauna species distribution in Lyons Creek Planning Watershed during 2001, 2002, 2004, 2005 & 2008 surveys.

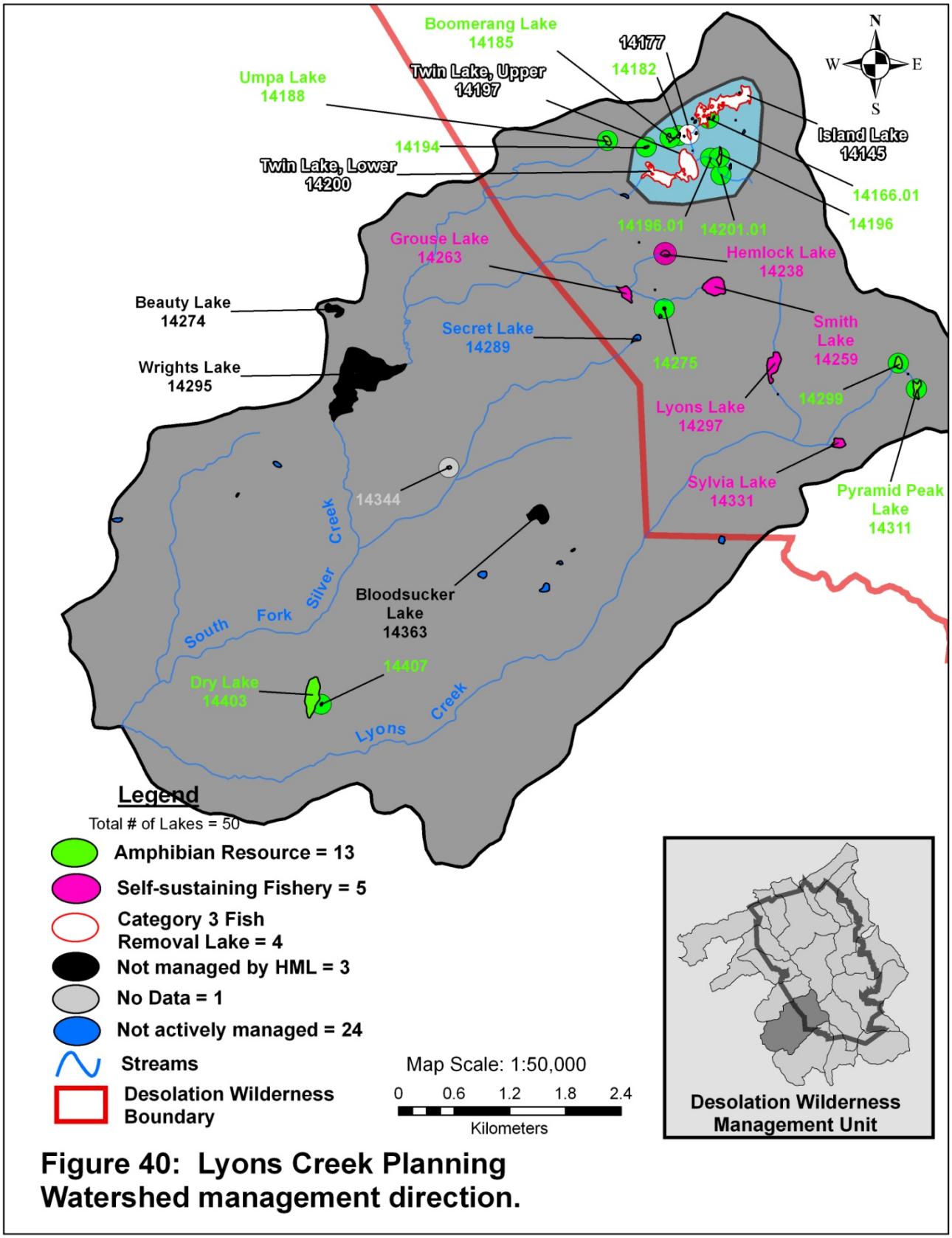

Figure 40: Lyons Creek Planning Watershed management direction.

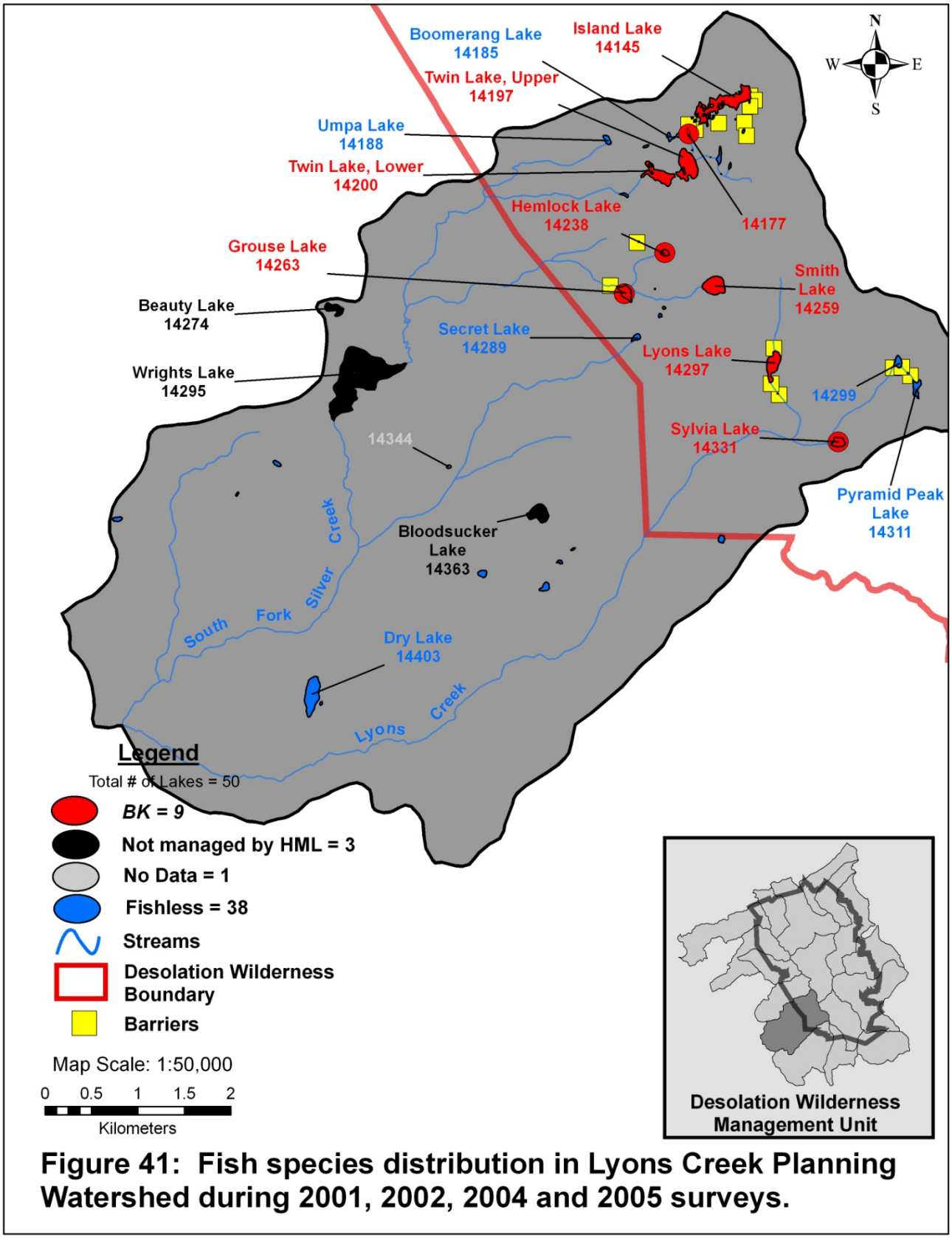

Figure 41: Fish species distribution in Lyons Creek Planning Watershed during 2001, 2002, 2004 and 2005 surveys.

12) MEEKS CREEK PLANNING WATERSHED MANAGEMENT DIRECTION

Meeks Creek PWS includes Meeks Creek which drains north from Desolation Wilderness into Meeks Bay in Lake Tahoe. Seven named lakes and 17 unnamed waters are found within the PWS. The PWS is accessible by the Tahoe-Yosemite Trail from Meeks Bay and receives heavy overnight visitation.

Table 34 provides summary data for amphibian resources and management in the Meeks Creek PWS. Table 35 provides a summary of fish population data for the Meeks Creek PWS. Table 36 provides a summary of fisheries management for the Meeks Creek PWS. Figure 42 provides herpetofauna species distribution for the Meeks Creek PWS. Figure 43 provides the management direction for the Meeks Creek PWS. Figure 44 provides fish species distribution for the Meeks Creek PWS.

Herpetofauna Resources and Management
No SNYLF populations are known to currently exist within the Meeks Creek PWS and CDFG has no records of historic sightings within the PWS.

AMMA larvae were observed by CDFG field crews at Lake ID's 13774, 13782 and 13830. All three unnamed ponds will be managed as amphibian breeding locations.

Forest Service personnel observed BUBO at Stony Ridge Lake in 1998. Although not detected during subsequent CDFG surveys, CDFG believes that the species persists within the basin and likely at Stony Ridge Lake in particular.

Fisheries Resources and Management
Cliff Lake was stocked with brook trout from 1951 until 1964. Golden trout stocking was introduced in the late 1960s with little success. Brook trout do quite well in the lake and are very abundant. Since this lake is only accessible via a rugged cross country route and has a self-sustaining fish population, it does not need to be stocked. Cliff Lake will continue to be managed as a self-sustaining brook trout fishery.

CDFG stocked Crag Lake (Photo 15) with brook trout from 1939 until 2000. Despite the lack of variation in species stocked, recent and historic gill net surveys caught brown trout, brook trout, rainbow trout, and Lahontan redsides. Additional reports of tui chub and speckled dace are noted in historic surveys. Amongst anglers, the lake is well known for naturally reproducing brown trout which grow to large sizes on ample forage fish. The source of additional species is unknown but the data suggest brown trout do quite well without stocking and therefore the lake will be managed as a self-sustaining fishery.

Genevieve Lake was stocked with brook trout from 1939 to 2000 but is also known to harbor brown trout and rainbow trout in low densities. CDFG gill net data show brook trout grow to a large size on the ample supply of Lahontan redside forage. However, the brook trout show little evidence of natural reproduction. CDFG believes that any species of trout will be self-sustaining to a degree because of unimpeded access to ample spawning habitat within Meeks Creek. The lake will be managed as a self-sustaining fishery but will be monitored to ensure that fisheries management objectives are met without the use of supplemental fingerling stocking.

Fish population data for Hidden Lake is very poor and difficult to interpret. Gill net samples in 2003 returned only two rainbow trout however there are anecdotal reports of anglers catching brook trout. The lake was stocked with brook trout from 1934 to 1985 and rainbow trout from 1969 to 2003. Due to open access to stream habitat for spawning it is believed that one or more of the species stocked would be self-sustaining and will return in gill net samples. Further data collection is necessary before a management direction for Hidden Lake can be finalized. Until a complete fishery assessment can be completed the lake will be managed as a self-sustaining fishery.

Photo 15: Crag Lake looking south (1951 B.H. Unruh)

Rubicon Lake was stocked with brook trout from 1939 to 1972. Rainbow trout were stocked from 1973 to 1980 but did not establish a successful population. Gill net data collected in 2003 show the brook trout are self-sustaining at a low density with individuals commonly reaching 10 to 12 inches. No rainbow trout were caught in the sample. Rubicon Lake is producing healthy fish without stocking and will continue to be managed as a self-sustaining brook trout fishery.

Shadow Lake was stocked with brook trout from 1939 to 2002. It is shallow and has unimpeded access to large sections of spawning habitat in Meeks Creek. Gill net data from 2003 indicated a robust brook trout population exhibiting a range of sizes. Additionally two large brown trout were captured in the sample. It is unclear if the brook trout naturally reproduce within the lake, although they almost certainly do within the tributaries. The lake will be managed as a self-sustaining fishery with follow-up monitoring surveys to test whether the fishery remains healthy without stocking.

Stony Ridge Lake was likely the location of the first lake trout introduction into the Lake Tahoe basin (Dill and Cordone 1997). CDFG has records of historical brook trout plants and, more recently, rainbow trout from 1943 to 2002. CDFG gill net data from 2003 returned a single rainbow trout but does not reflect what is known about the fishery from angler reports. Brown trout, brook trout and lake trout are known to be self-sustaining. There is ample spawning habitat in the inlets but access to Meeks Creek at the outlet is limited due to a check dam constructed in 1949. Stocking will be halted and the lake managed as a multiple species self-sustaining fishery.

Lake ID 13808 is an unnamed lake near Crag Lake. CDFG has no record of it being stocked but gill net sampling returned brook trout and brown trout. The lake will not be stocked and will be managed as a self-sustaining fishery.

Lake ID 25940 is an unnamed lake connected to Meeks Creek between Rubicon Lake and Stony Ridge Lake. CDFG survey crews did not set a gill net in the lake but did visually observe fish and evidence of natural reproduction. Because of these observations and the unimpeded connectivity to Meeks Creek, CDFG believes multiple species of trout are self-sustaining within the water body. As a result, the unnamed lake will be managed as a self-sustaining fishery.

Table 34. Summary of herpetofauna survey data and management for Meeks Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
Cliff Lake	13869.00	21-Jul-03	None						Self-sustaining fishery
Crag Lake	13810.00	17-Jul-03	THEL	1	0	0	0	0	Self-sustaining fishery
Genevieve Lake	13789.00	17-Jul-03	None						Self-sustaining fishery
Hidden Lake	13837.00	18-Jul-03	None						Self-sustaining fishery
Rubicon Lake	13883.00	22-Jul-03	HYRE	0	0	0	17	0	Self-sustaining fishery
Shadow Lake	13832.00	18-Jul-03	HYRE	0	0	0	2	0	Self-sustaining fishery
			THEL	3	0	0	0	0	
Stony Ridge Lake	13851.00	21-Jul-03	THEL	1	0	0	0	0	Self-sustaining fishery
	13717.00	1-Aug-03	HYRE	0	0	0	2	0	Amphibian resource
			THSI	1	0	0	0	0	
	13774.00	3-Aug-03	HYRE	0	0	175	700	0	Amphibian resource
			AMMA	0	0	0	10	0	
	13782.00	19-Jul-03	HYRE	0	0	0	2200	0	Amphibian resource
			AMMA	0	0	0	9	0	
	13783.00	19-Jul-03	HYRE	0	0	0	875	0	Amphibian resource
			THEL	1	0	0	0	0	
	13808.00	17-Jul-03	HYRE	0	0	0	180	0	Amphibian resource
	13817.00	19-Jul-03	HYRE	0	0	0	430	0	Amphibian resource
	13830.00	18-Jul-03	HYRE	0	0	0	1500	0	Amphibian resource
			AMMA	0	0	0	275	0	
			THEL	1	0	0	0	0	
	13836.00	18-Jul-03	HYRE	0	0	0	5	0	Amphibian resource
	13840.00	20-Jul-03	HYRE	0	0	0	190	0	Amphibian resource
	13846.00	20-Jul-03	HYRE	0	0	0	86	0	Amphibian resource
	25940.00	23-Jul-03	HYRE	0	0	0	92	0	Self-sustaining fishery

Table 35. Summary of fish population data for Meeks Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Cliff Lake	13869.00	21-Jul-03	BK	yes	13	233	134	1.007
Crag Lake	13810.00	17-Jul-03	BK	unknown	1	312	279	0.919
			BN	yes	5	297	248	0.837
			RT	yes	1	356	372	0.825

Table 35, Con't. Summary of fish population data for Meeks Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Genevieve Lake	13789.00	17-Jul-03	BK	unknown	12	290	236	0.948
			BN	yes	4	313	309	0.955
			LRS	yes	7			
			RT	yes	1	350	398	0.928
Hidden Lake	13837.00	18-Jul-03	RT	unknown	2	292	417	1.038
Rubicon Lake	13883.00	22-Jul-03	BK	yes	10	267	173	0.908
Shadow Lake	13832.00	18-Jul-03	BK	unknown	13	234	154	1.033
			BN	yes	3	353	435	0.986
Stony Ridge Lake	13851.00	21-Jul-03	RT	unknown	1	385	510	0.894
	13808.00	17-Jul-03	BK	yes	1	389	754	1.281
			BN	yes	1	405	802	1.207

Table 36. Summary of fisheries management information for Meeks Creek PWS.

Lake Name	Lake ID	First Recorded Stocking	Last Recorded Stocking	Pre-Survey Allotments	Current Proposed Allotment	Management Direction
Cliff Lake	13869.00	1951 - BK 1966 - GT	1964 - BK 1970 - GT	DNP	DNP	Self-sustaining fishery
Crag Lake	13810.00	1939 - BK 1966 - BN	2000 - BK 1969 - BN	1000 BK ANN	DNP	Self-sustaining fishery
Genevieve Lake	13789.00	1939 - BK 1967 - BN	2000 - BK 1969 - BN	2000 BK ANN	DNP	Self-sustaining fishery
Hidden Lake	13837.00	1934 - BK 1979 - CT-L 1967 - RT	1985 - BK 1996 - CT-L 2003 - RT	500 RT ANN	DNP	Self-sustaining fishery
Rubicon Lake	13883.00	1939 - BK 1925 - RT	1972 - BK 1980 - RT	DNP	DNP	Self-sustaining fishery
Shadow Lake	13832.00	1939 - BK 1939 - BN 1969 - RT	2002 - BK 1942 - BN 1976 - RT	500 BK ANN	DNP	Self-sustaining fishery
Stony Ridge Lake	13851.00	1939 - BK 1943 - RT	1979 - BK 2002 - RT	8000 RT ANN	DNP	Self-sustaining fishery

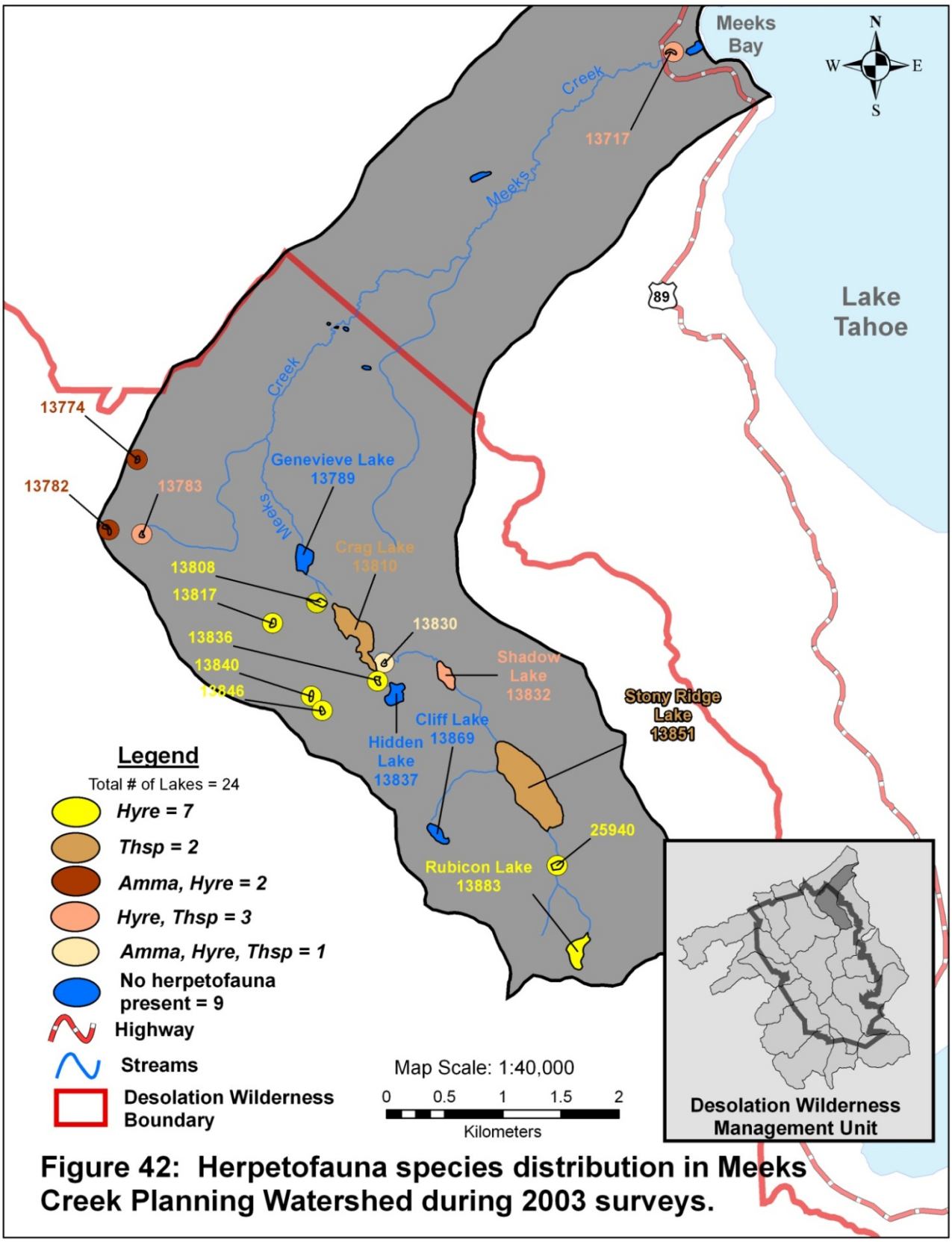

Figure 42: Herpetofauna species distribution in Meeks Creek Planning Watershed during 2003 surveys.

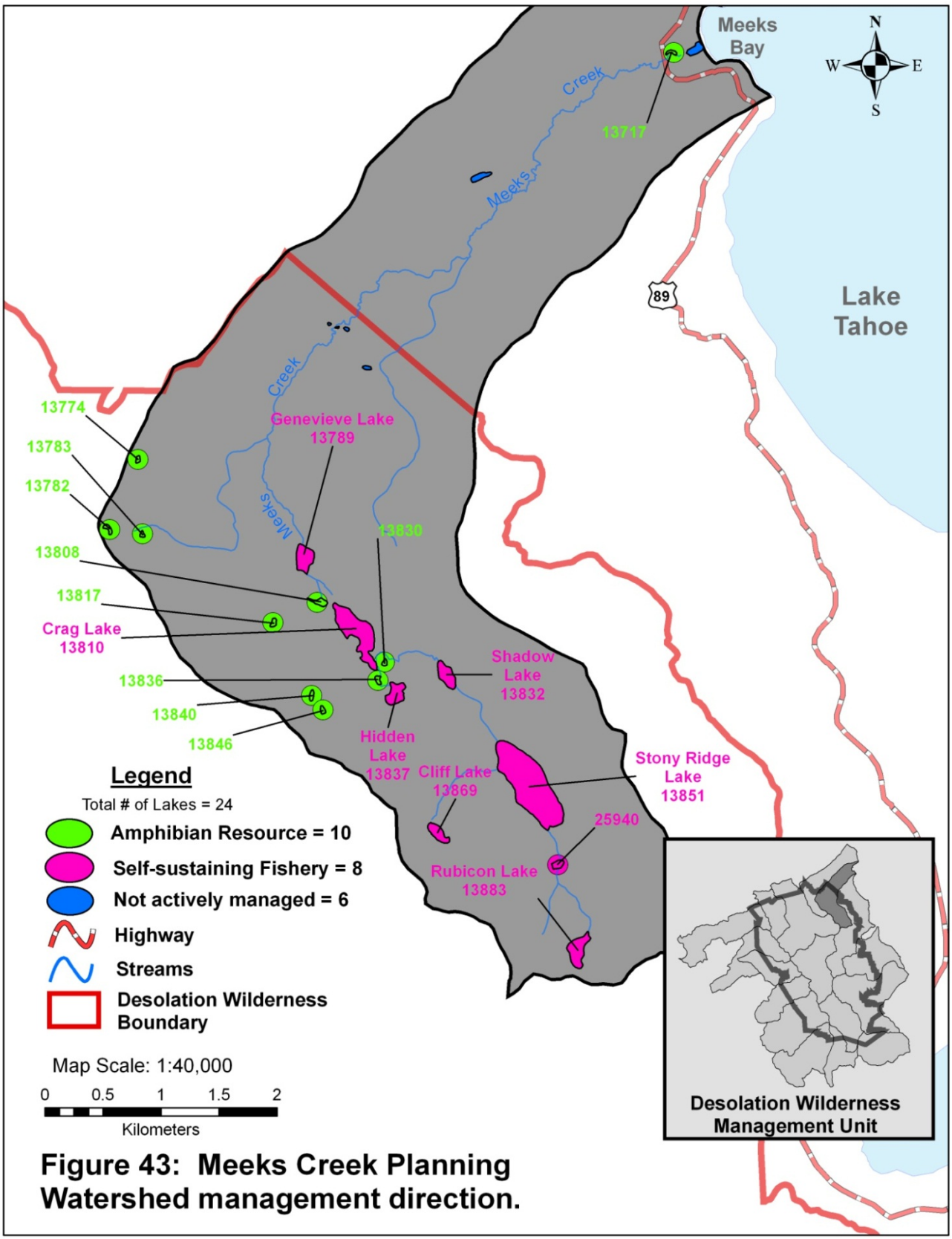

Figure 43: Meeks Creek Planning Watershed management direction.

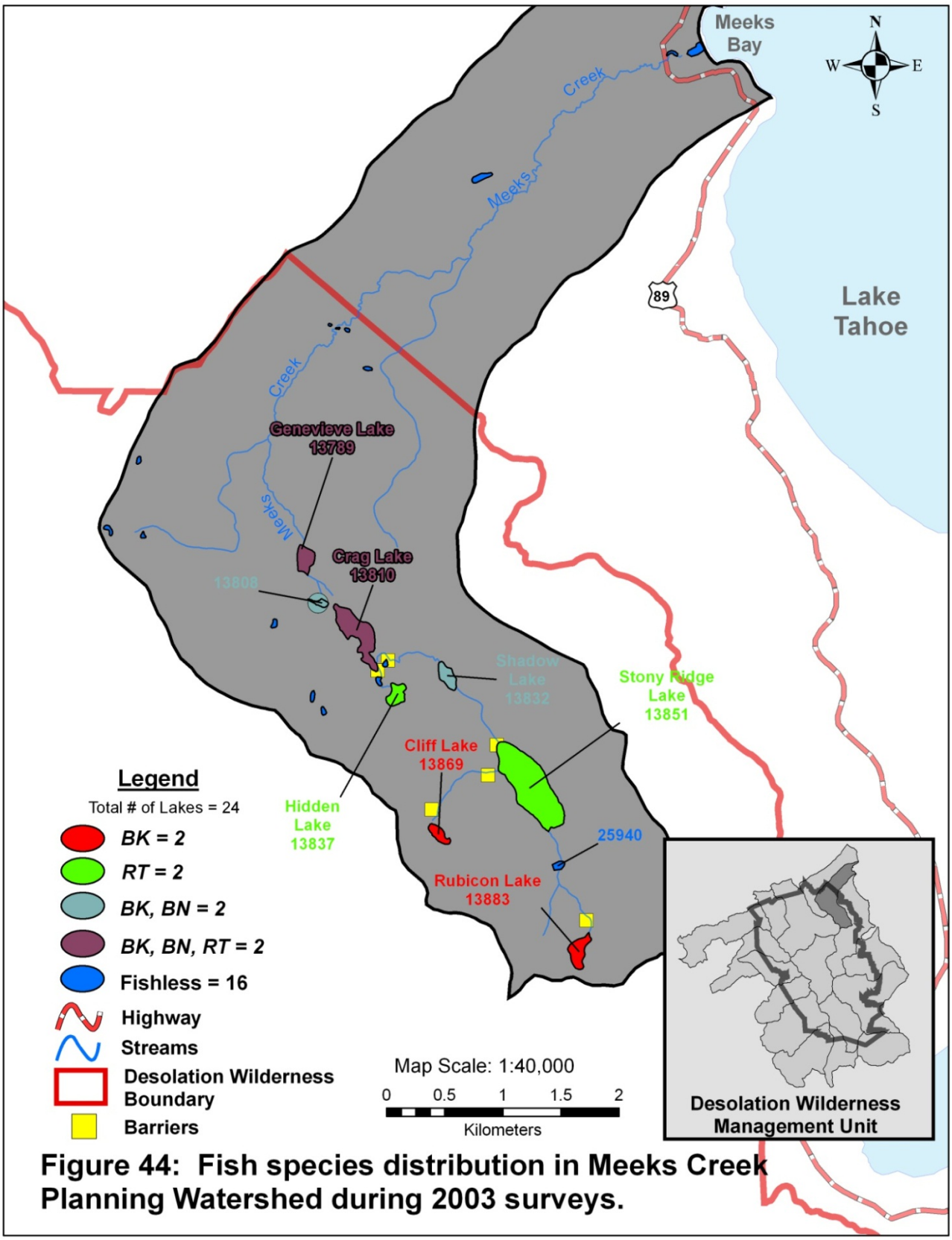

Figure 44: Fish species distribution in Meeks Creek Planning Watershed during 2003 surveys.

13) PHIPPS CREEK PLANNING WATERSHED MANAGEMENT DIRECTION

The most notable features of Phipps Creek PWS are the Rubicon River and Rubicon Reservoir. The PWS includes the lower reaches of Rockbound Valley and the Rubicon River from Camper Flat to Rubicon Springs. The Rubicon River drains to Hellhole Reservoir and ultimately to the Middle Fork American River. There is a diversion at Rubicon Reservoir which moves water from the Rubicon River watershed into Rockbound Lake via an aqueduct and ultimately to Loon Lake and the South Fork American River watershed. Twelve named lakes and 32 unnamed waters are found within the PWS. Lake ID 13765 has not been surveyed by CDFG and is not addressed in this plan.

The PWS is located in the remote north-central section of the Desolation Wilderness and is not easily accessed. The lower watershed can be accessed using the Rubicon Trail from Loon Lake or the Rubicon OHV Trail. The upper watershed is a long hike from any trailhead but can be accessed from Wrights Lake using the Rockbound Trail or from Emerald Bay along the Velma Lakes Trail. The most direct access to the upper watershed is a cross country route from Number 3 Lake between Red and Silver peaks. As a result of the difficult access, this area receives much less use than other portions of the Desolation Wilderness.

Table 37 provides summary data for amphibian resources and management in the Phipps Creek PWS. Table 38 provides a summary of fish population data for the Phipps Creek PWS. Table 39 provides a summary of fisheries management for the Phipps Creek PWS. Figure 45 provides herpetofauna species distribution for the Phipps Creek PWS. Figure 46 provides the management direction for the Phipps Creek PWS. Figure 47 provides fish species distribution for the Phipps Creek PWS.

Herpetofauna Resources and Management

SNYLF have been observed within the Phipps Creek PWS at Upper Leland Lake, Lower Leland Lake, McConnell Lake, and Zitella Lake by Eldorado National Forest and CDFG biologists. Because of the presence of multiple SNYLF breeding locations and the lack of visitor use, CDFG is designating the sub-basin as a reserve for native species. The native species reserve will include the lakes listed above as well as Horseshoe Lake and the 4-Q lakes.

CDFG observed breeding AMMA in Lower Leland Lake and Lake ID 13882. In addition, the species was observed at numerous ponds and lakes within the 4-Q lakes complex in 1993 by USFS personnel. The species was not observed during subsequent surveys but CDFG believes that AMMA may persist in these locations.

CDFG observed a single BUBO adult at Fox Lake in 1996. Although there have been no detections in subsequent surveys it is likely that the species persists.

Horseshoe Lake was stocked with several species including golden trout, rainbow trout and brook trout. Most recently it was stocked with brook trout up until 2000. Gill net monitoring in 2008 and 2010 returned no fish indicating the lake is fishless. As a result, Horseshoe Lake will be managed as a translocation destination to expand SNYLF populations within the Phipps Creek PWS.

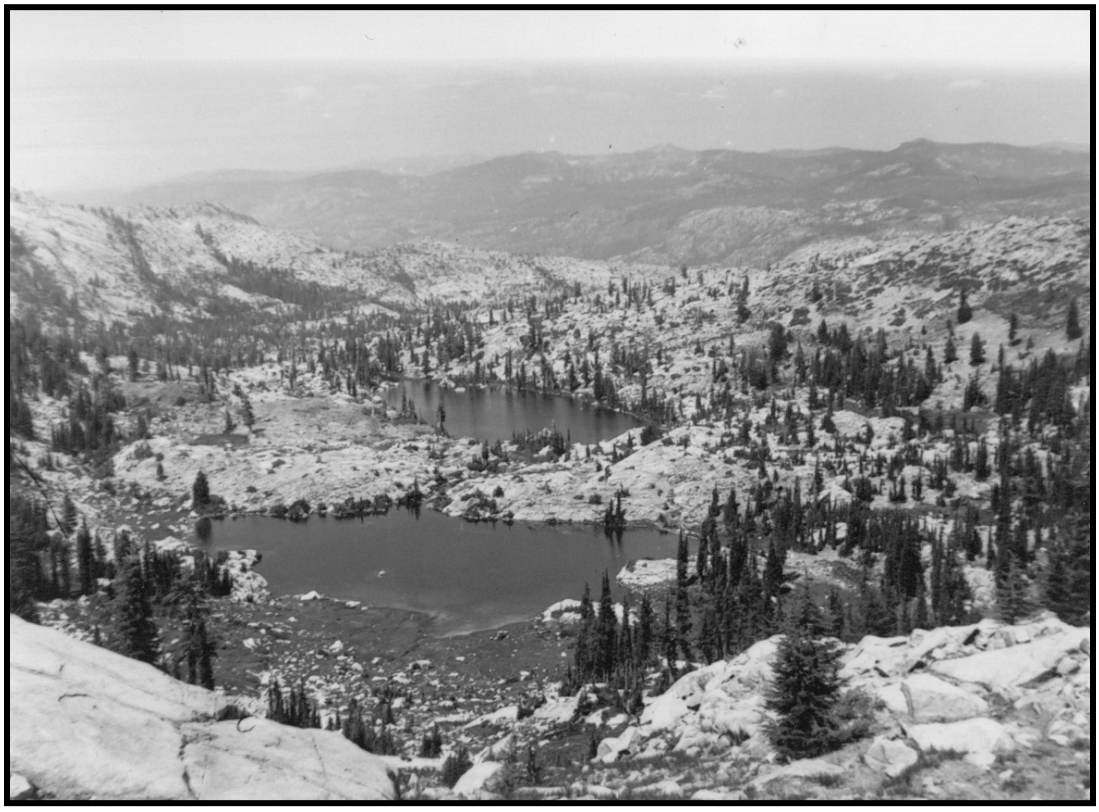

Photo 16: Leland lakes looking north (1950 J.C. Fraser, CDFG)

Upper and Lower Leland lakes (Photo 16) were stocked with golden trout from 1931 until 1993 and 1999, respectively. In 1937 Paiute cutthroat trout (*Oncorhynchus clarkii seleneris*) were taken from Fish Valley in Alpine County and stocked in the Leland lakes in a publicized attempt to establish a new refuge for the sub-species. The Paiute cutthroat trout did not reproduce in Leland lakes and eventually died off. Adult and larval SNYLF were observed in Upper Leland Lake in 1993 and stocking was halted as a result. The golden trout were not self-sustaining in the lakes and subsequently disappeared from Upper Leland Lake and dwindled to very low levels in Lower Leland Lake. CDFG and Eldorado National Forest mechanically removed the remaining golden trout from Lower Leland Lake from 2000 to 2003. Gill net monitoring conducted by CDFG in 2008 and 2010 verified that both lakes remain fishless and SNYLF larvae remain in Upper Leland Lake.

McConnell Lake is a shallow, marsh-like lake downstream from Lower Leland Lake. Although CDFG has no record of the lake ever being stocked, the lake sustains a healthy golden trout population that reproduces naturally in the extensive inlet and outlet system. Most likely, the initial introduction of golden trout was flushed downstream from the Leland lakes. Electrofishing surveys conducted in 1993 found numerous small golden trout in the stream between the two lakes which supports the idea of downstream immigration. SNYLF larvae and adults have been observed within the lake during multiple surveys. CDFG recognizes that removal of golden trout from McConnell Lake is biologically sound; however, fish removal at this site is not feasible without chemical treatment due to the extensive fish-bearing tributary systems. Therefore, McConnell Lake will be managed as a self-sustaining golden trout fishery until such time that fish removal becomes feasible.

The 4-Q lakes were stocked with brook trout from 1931 until 2000. The lakes are shallow and silt-bottomed with little to no spawning habitat. Gill net monitoring in 2010 returned no fish, indicating the lakes have gone fishless in the absence of stocking. As a result, the 4-Q lakes will be managed as a translocation destination to expand the SNYLF population within the Phipps Creek PWS.

Photo 17: Zitella Lake looking southwest (2008 Andrew Guest, CDFG)

Zitella Lake (Photo 17) was stocked with brook trout from 1935 to 1973. The lake was known to be relatively shallow and susceptible to winterkill. During a

CDFG survey in 1986 it was suspected of being fishless. Gill net sets in 1995, 2008 and 2010 returned no fish confirming the lake is fishless. SNYLF larvae and adults were found in 1993 and low numbers of multiple life stages have been observed in subsequent surveys. Individual SNYLF were sampled for Bd in 2008, the results showed no zoospores present in the population. Additional monitoring is necessary to confidently claim the population is negative for Bd. This is one of two populations in the Desolation Wilderness that were negative during CDFG's initial baseline Bd assessment. The lake will not be stocked again and will be managed as an SNYLF breeding resource.

Fisheries Resources and Management

Fox Lake was stocked with brook trout from 1938 until 2000. According to historic surveys there was little to no natural reproduction and individual fish grew quite large. Recent gill net data suggest the lake has gone fishless in the absence of stocking. Due to USFS wilderness management objectives, the lake will remain fishless and will no longer be actively managed by CDFG.

Phipps Lake is a remote brook trout fishery accessible from the Tahoe-Yosemite Trail. It was stocked with brook trout from 1940 to 1965. The brook trout are abundant and easily become stunted. Golden trout were stocked from 1972 to 1986; however, recent gill net data show the golden trout did not persist. Stocking of golden trout will resume at Phipps Lake with monitoring to determine survival of golden trout fingerlings. If necessary, CDFG will attempt to suppress the existing brook trout population to assist golden trout recruitment. Gill nets, traps and/or electrofishers will be utilized to reduce the numbers, density and spawning success of the brook trout population. If such an effort results in reduced predation and competition for space, golden trout recruitment from fingerling to adult life stage should increase.

Built in the late 1950s, the Rubicon Reservoir is a large, artificial impoundment on the Rubicon River that is used to store and divert water to Loon Lake and the South Fork American River watershed as part of the Upper American River hydroelectric project (FERC No. 2101). CDFG has stocked the reservoir with rainbow trout since 1965 and it will continue to be managed as stocked lake with annual rainbow trout stocking. According to angler reports, brook trout and brown trout are also resident in the reservoir.

Table 37. Summary of herpetofauna survey data and management for Phipps Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
Bufo Lake	13936.00	5-Jul-03	None						Not actively managed
Fox lake	13804.00	7-Jul-03	HYRE	0	0	0	1	1	Not actively managed
			THCO	1	0	0	0	0	
Horseshoe Lake	13907.00	19-Jul-08	HYRE	0	0	0	4	0	Native species restoration - Category 1
			THCO	1	0	0	0	0	
Lake Zitella	13900.00	13-Aug-05	THEL	0	1	0	0	0	Amphibian resource
		20-Jul-08	HYRE	0	0	0	2	0	
		20-Jul-08	SNYLF	1	2	0	1	0	
		20-Jul-08	THCO	1	0	0	0	0	
Leland Lake, Lower	13944.00	16-Jul-02	HYRE	1	0	0	0	0	Native species restoration - Category 1
		22-Jul-03	THEL	1	0	0	0	0	
		13-Aug-05	AMMA	0	0	2	0	0	
		13-Aug-05	SNYLF	1	0	0	0	0	
Leland Lake, Upper	13959.00	19-Jul-08	HYRE	0	0	0	6	0	Native species restoration - Category 1
			SNYLF	0	0	0	22	0	
McConnell Lake	13921.00	5-Jul-03	THEL	1	0	0	0	0	Native species restoration - Category 3
		19-Jul-08	HYRE	0	0	0	82	0	
		19-Jul-08	SNYLF	0	0	0	4	0	
Phipps Lake	13893.00	1-Aug-05	None						Stocked lake
Q Lake, Lower	13928.00	4-Jul-03	None						Native species restoration - Category 1
Q Lake, Middle	13932.00	4-Jul-03	None						Native species restoration - Category 1
Q Lake, Upper	13922.00	4-Jul-03	None						Native species restoration - Category 1
Rubicon Reservoir	13831	no survey							Stocked lake
	13762.00	7-Jul-03	HYRE	0	0	20	45	0	Amphibian resource
	13779.00	7-Jul-03	HYRE	0	0	0	37	0	Amphibian resource
	13804.01	7-Jul-03	HYRE	0	0	0	1	0	Not actively managed
	13822.00	6-Jul-03	HYRE	8	0	0	0	0	Not actively managed
			THCO	2	0	0	0	0	
	13854.00	6-Jul-03	HYRE	0	0	0	53	0	Amphibian resource

Table 37, Con't. Summary of herpetofauna survey data and management for Phipps Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
	13882.00	13-Aug-05	AMMA	0	0	7	0	0	Amphibian resource
			HYRE	0	0	3	0	0	
			THSP	0	1	0	0	0	
	13911.00	10-Jul-01	HYRE	0	0	0	100	0	Amphibian resource
	13913.00	4-Jul-03	THEL	1	0	0	0	0	Not actively managed
	13916.00	4-Jul-03	HYRE	0	0	0	453	0	Amphibian resource
	13918.00	12-Aug-05	HYRE	15	0	150	0	0	Amphibian resource
			THEL	3	0	0	0	0	
	13918.01	8-Jul-03	HYRE	0	0	0	450	0	Amphibian resource
			THCO	2	0	0	0	0	
	13920.00	4-Jul-03	HYRE	0	0	0	84	0	Amphibian resource
	13924.00	4-Jul-03	HYRE	0	0	0	4	4	Amphibian resource
			THCO	1	0	0	0	0	
	13925.00	4-Jul-03	HYRE	0	0	0	2	0	Amphibian resource
	13934.00	5-Jul-03	HYRE	0	0	0	3	0	Amphibian resource

Table 38. Summary of fish population data for Phipps Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Bufo Lake	13936.00	5-Jul-03	None					
Fox lake	13804.00	7-Jul-03	None					
Horseshoe Lake	13907.00	19-Jul-08	None					
Lake Zitella	13900.00	20-Jul-08	None					
Leland Lake, Lower	13944.00	19-Jul-08	None					
Leland Lake, Upper	13959.00	5-Jul-03	None					
McConnell Lake	13921.00	19-Jul-08	GT	yes	9	169	56	0.953
Phipps Lake	13893.00	1-Aug-05	BK	yes	17			
4-Q Lake, Lower	13928.00	4-Jul-03	BK	unknown	2			
4-Q Lake, Middle	13932.00	4-Jul-03	BK	no	3	381	870	1.573
4-Q Lake, Upper	13922.00	4-Jul-03	BK	unknown	1			
Rubicon Reservoir	13831.00	No Survey						

Table 39. Summary of fisheries management information for Phipps Creek PWS.

Lake Name	Lake ID	First Recorded Stocking	Last Recorded Stocking	Pre-Survey Allotments	Current Proposed Allotment	Management Direction
Bufo Lake	13936.00	1931 - BK	1931 - BK	DNP	DNP	Not actively managed
Fox lake	13804.00	1938 - BK	2000 - BK	500 BK ANN	DNP	Not actively managed
Horseshoe Lake	13907.00	1935 - BK 1936 - RT	2000 - BK 1968 - RT	DNP	DNP	Native species restoration - Category 1
Lake Zitella	13900.00	1935 - BK 1936 - RT	1973 - BK 1966 - RT	DNP	DNP	Amphibian resource
Leland Lake, Lower	13944.00	1931 - GT	1999 - GT	1000 GT ANN	DNP	Native species restoration - Category 1
Leland Lake, Upper	13959.00	1931 - GT	1993 - GT	DNP	DNP	Native species restoration - Category 1
McConnell Lake	13921.00			DNP	DNP	Native species restoration - Category 3
Phipps Lake	13893.00	1940 - BK 1972 - GT	1965 - BK 1986 - GT	DNP	1000 GT ANN	Stocked lake
Q Lake, Lower	13928.00	1931 - BK	2000 - BK	250 BK BNE	DNP	Native species restoration - Category 1
Q Lake, Middle	13932.00	1931 - BK	2000 - BK	500 BK BNE	DNP	Native species restoration - Category 1
Q Lake, Upper	13922.00	1931 - BK	1999 - BK	500 BK BNO	DNP	Native species restoration - Category 1
Rubicon Reservoir	13831.00	1965 - RT	2007 - RT	10,000 RT ANN	10,000 RT ANN	Stocked lake

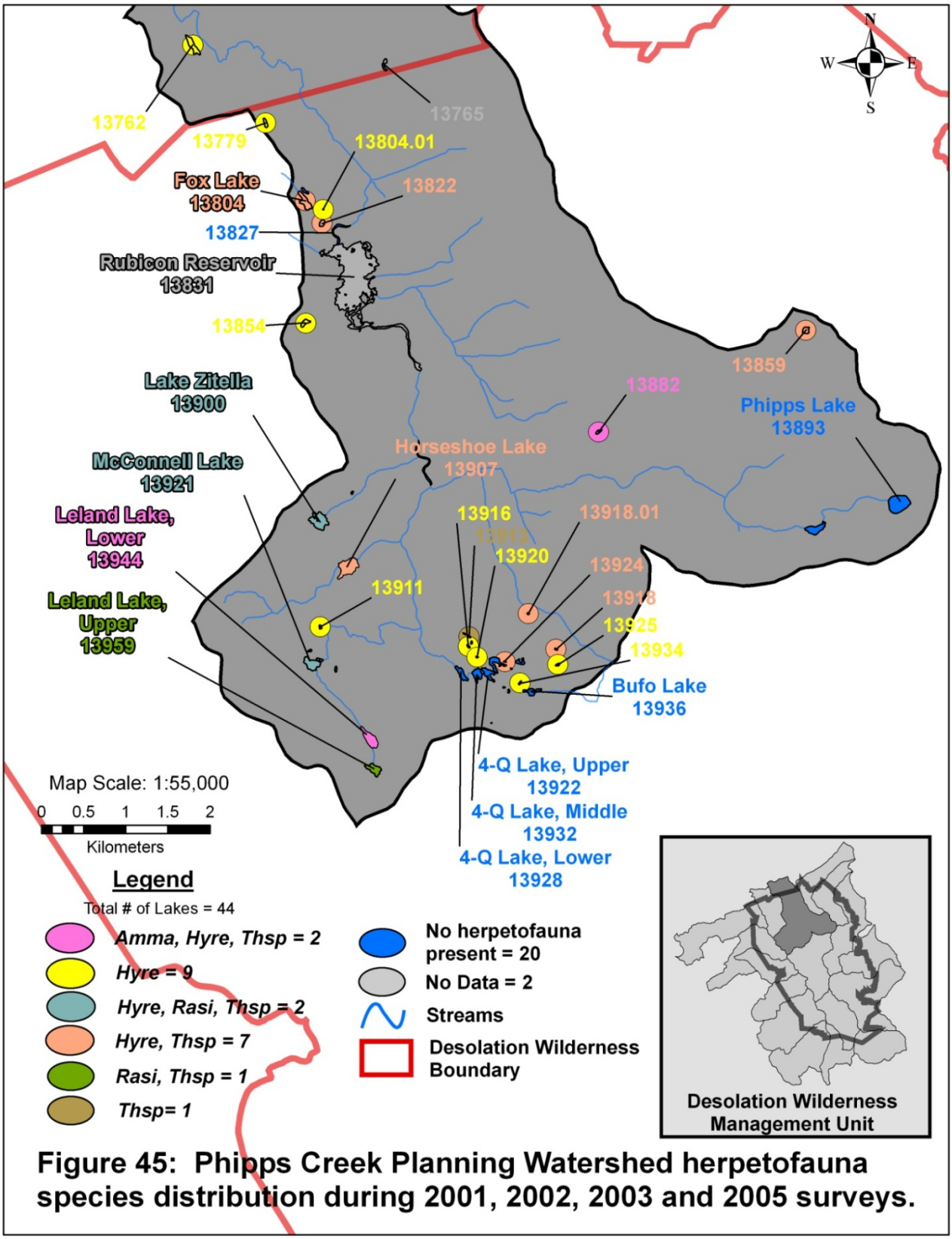

Figure 45: Phipps Creek Planning Watershed herpetofauna species distribution during 2001, 2002, 2003 and 2005 surveys.

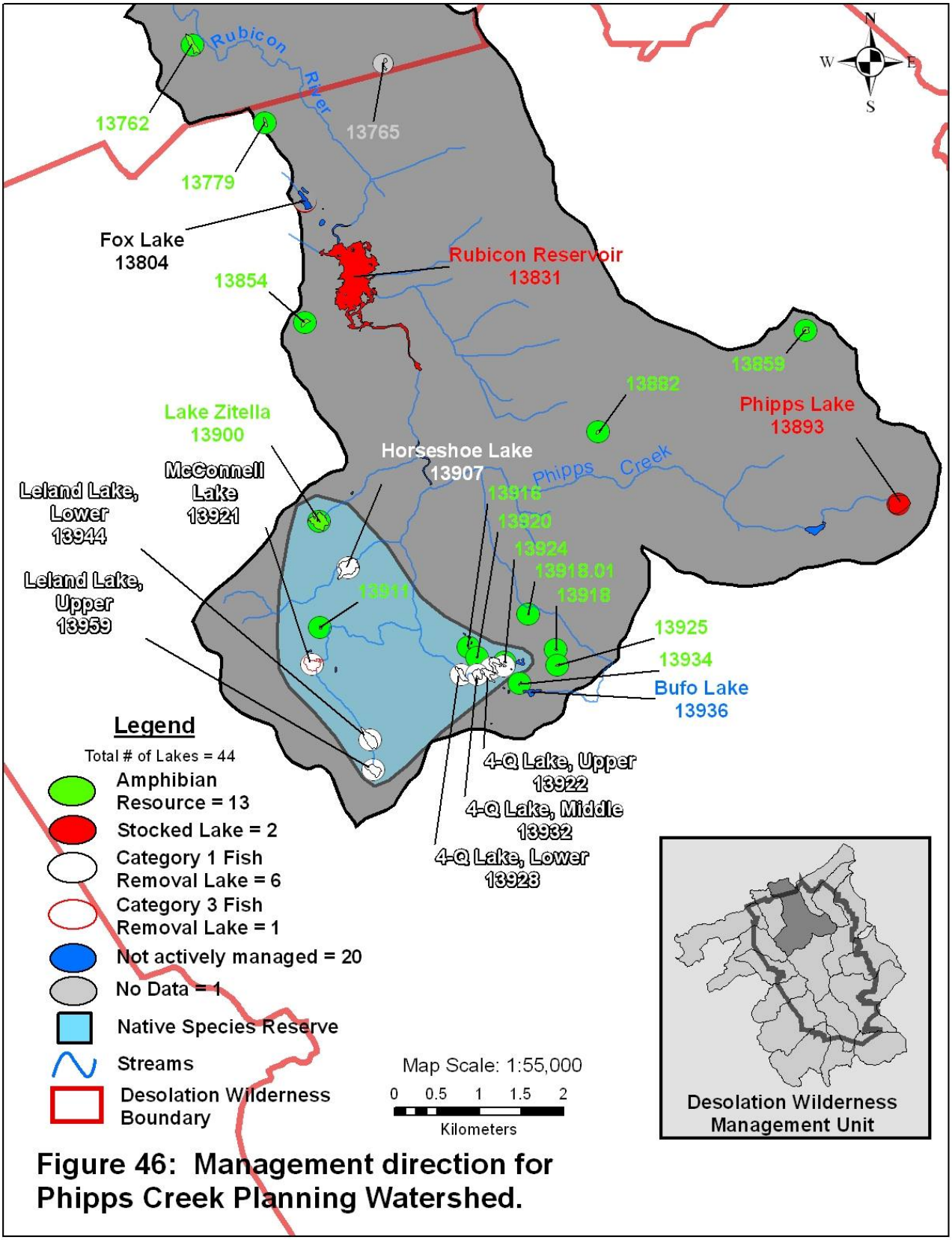

Figure 46: Management direction for Phipps Creek Planning Watershed.

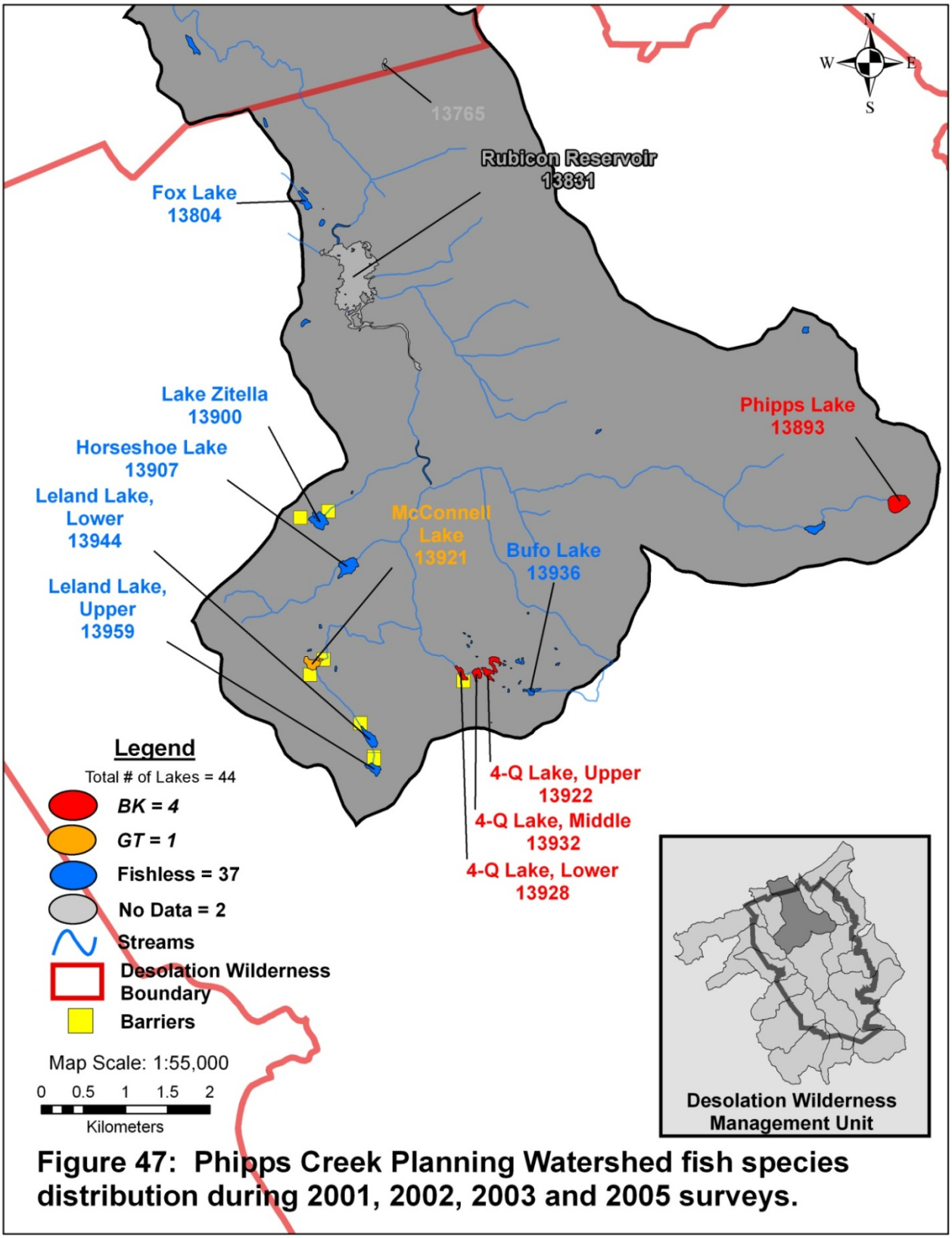

Figure 47: Phipps Creek Planning Watershed fish species distribution during 2001, 2002, 2003 and 2005 surveys.

14) PYRAMID CREEK PLANNING WATERSHED MANAGEMENT DIRECTION

Pyramid Creek PWS holds the most visited areas in the Desolation Wilderness. Several lakes within the PWS are extremely popular day hike and overnight destinations. Desolation Valley (Photo 18) fisheries have a reputation amongst backcountry anglers for producing large trout. Moreover, the PWS supports one of the most robust SNYLF populations in the northern Sierra Nevada. Pyramid Creek drains south from its headwaters at Lake Aloha over Horsetail Falls and into the South Fork American River near Twin Bridges. Fourteen named lakes and 104 unnamed water bodies are found within the PWS.

The lakes within this PWS are most often accessed by the Pacific Crest Trail from Echo Lake. It can also be accessed from Fallen Leaf Lake via the Glen Alpine Trail and the Mt. Tallac Trail or from Twin Bridges via the Horsetail Falls Trail. Most of the use is clustered around Lake of the Woods and the Pacific Crest Trail corridor near Lake Aloha. Ropi Lake is also a popular overnight destination. Overnight use tapers off steeply for lakes further from the Pacific Crest Trail but day hikers frequent many corners of the basin in peak season.

Table 40 provides summary data for amphibian resources and management in the Pyramid Creek PWS. Table 41 provides a summary of fish population data for the Pyramid Creek PWS. Table 42 provides a summary of fisheries management for the Pyramid Creek PWS. Figures 48, 49, 54, and 55 provide herpetofauna species distribution for the Pyramid Creek PWS. Figures 50 and 51 provide the management direction for the Pyramid Creek PWS. Figures 52 and 53 provide fish species distribution for the Pyramid Creek PWS.

Photo 18: Upper Desolation Valley panorama (1951 C.K. Fisher, CDFG)

Herpetofauna Resources and Management

Pyramid Creek PWS supports one of the most robust SNYLF populations in CDFG NCR. SNYLF breeding was detected by CDFG survey crews at Lake Aloha, Pyramid Lake and Waca Lake and Lake ID's 14221, 14221.01, 50354, 14292, 14294, 14306, 14312, 14341, 14345 and 14356. Much of the breeding habitat is networked via interconnected streams, ponds and ephemeral water bodies. The volume and diversity of habitats seems to facilitate broad dispersal by adult and sub-adult life stages that were observed at many water bodies throughout Desolation Valley. This has led CDFG to designate the entire PWS as a native species reserve. Stocking has been ceased throughout the

watershed and all fish-bearing waters have been designated as fish removal sites.

Mechanical fish removal is not feasible in most of the fish-bearing lakes and streams of Desolation Valley. Specifically, the 11 lake chain along the main stem Pyramid Creek, beginning with Lake Aloha and ending with Avalanche Lake, support self-sustaining brook trout that would require a massive chemical treatment project to remove. Therefore these lakes will be managed as self-sustaining brook trout fisheries until such time that fish removal becomes feasible.

Lake of the Woods is designated as a fish removal site but will be managed as a self-sustaining trophy rainbow trout fishery until such time that fish removal is possible. Although fish removal at Lake of the Woods is likely feasible without chemical treatment, CDFG recognizes public use conflicts with removing fish from one of the most visited lakes in the Desolation Wilderness. Instead, several translocation options are detailed below to provide deep water breeding habitat for the SNYLF population in marginal ponds immediately adjacent to Lake of the Woods.

Gefo Lake is a small, shallow lake that was stocked with brook trout from 1930 to 1999. Gill net data collected by CDFG in 2008 indicate brook trout at low densities but naturally reproducing. SNYLF breed in a small outlet pond (Lake ID 14341) just below the lake and adult and sub-adult life stages have been observed along the shoreline of Gefo Lake itself. There is nothing preventing brook trout from being flushed downstream into the outlet pond where they would be trapped by a small barrier preventing movement back into Gefo Lake. Although brook trout have never been observed in Lake ID 14341, it is likely that fish do occasionally occupy the pond. Regardless, the threat of trout moving into the breeding pond coupled with the opportunity to reclaim Gefo Lake as deep water habitat for the SNYLF population, led CDFG to identify Gefo Lake and Lake ID 14341 as fish removal locations. Eldorado National Forest personnel began mechanical fish eradication at these lakes in 2008. CDFG expects the project to be successful within the next two years and will continue to monitor the progress of the project and the response of the SNYLF population.

Pyramid Lake was originally stocked with brook trout in 1930 and continued until 1999. Rainbow trout and golden trout were stocked briefly but did not persist without stocking. Gill net data collected in 2003 indicate that brook trout do not reproduce in the lake. Multiple life stages of SNYLF were observed by Eldorado National Forest personnel in 1994 both within Pyramid Lake itself and in several adjacent ponds. Low numbers of SNYLF were found at the same water bodies by CDFG field crews in 2003. As a result, CDFG identified the lake as a fish removal site and Eldorado National Forest personnel began mechanical fish eradication efforts in 2007 by setting gill nets under ice for the duration of the winter. Monitoring by CDFG in 2008 indicate the eradication has been

successful and SNYLF larvae survival within Pyramid Lake has increased dramatically. Pyramid Lake will continue to be managed as an amphibian resource and will be monitored to ensure that all fish have been eradicated.

A single adult SNYLF and two larvae were detected at Waca Lake in 1994 by Eldorado National Forest personnel. It had been stocked with brook trout since 1931 but was known to have little to no natural reproduction. Stocking was halted in 1998 and the lake had few fish by 2003 when it was surveyed by CDFG HML personnel. CDFG subsequently identified Waca Lake as a fish removal site. Although no SNYLF were observed within the lake in 2003, individuals were known to move along the outlet stream from two nearby breeding ponds (Lake ID's 14292 and14294) indicating natural colonization was likely. Waca Lake flows ephemerally to Pyramid Lake thus the lake would need to be fishless to insure the success of fish removal at Pyramid Lake. Eldorado National Forest personnel set gill nets over winter in 2006 and 2007. In 2008, CDFG gill net surveys indicated the lake is fishless and SNYLF have subsequently established breeding in the lake. The lake will be managed as an amphibian resource and CDFG will continue to monitor for any remaining fish.

Frata Lake was stocked with brook trout in the 1930s until 1986 and was known as a marginal fishery. CDFG has not set a gill net at this location although there are anecdotal reports of the lake going fishless. Further data collection is necessary to determine if brook trout are still present. If fishless, Frata Lake will be considered as a translocation destination for SNYLF larvae originating in the marginal ponds west of Lake of the Woods.

Osma Lake may be fishless as well but requires further monitoring before a final decision can be made. CDFG has no record of stocking the lake and a short duration gill net set did not capture any fish. If the lake is fishless, this could be a reintroduction site for SNYLF larvae in the marginal ponds south of Gefo Lake and west of Osma Lake.

The three fish removal projects currently undertaken within the Pyramid Creek PWS have dramatically increased the available deep water habitat for SNYLF likely increasing the population's resilience to environmental extirpation pressures. In addition, there are large increases in observable SNYLF larvae within the population, particularly at Pyramid Lake. CDFG expects large cohorts recruiting to sub-adult life stage within the next two years. Monitoring will continue to document population response to fish removal.

Despite fish removal, the SNYLF population at Desolation Valley continues to be threatened by non-native fish and competing public interests. Desolation Valley is the most visited locale in Desolation Wilderness thus all proposed native species management presents potential public use conflicts. Furthermore, the greater SNYLF populations are intersected by a chain of lakes and connected streams that support self-sustaining brook trout. It is not known to what degree

these fish-bearing lakes impede movement or act as a population sink for adult and sub-adult SNYLF. A focused mark and recapture monitoring program would provide more reliable population estimates and trends which may prove useful in addressing these conflicts.

AMMA larvae were seen during HML surveys at Lake ID's 14245, 14260, 14267 and 25936. All four unnamed ponds will be managed as amphibian breeding resources.

Fisheries Resources and Management

Lake Aloha (Photo 19) is a large impounded water body which inundated a number of smaller ponds and lakes when the original dam was built in 1917. EID currently manages the water level and maintains the dam. CDFG stocked the lake with brook trout in 1930 until 2000, although other species were stocked sporadically it remained primarily a brook trout fishery. SNYLF breeding populations were initially found in nearby water bodies during surveys in the 1990s, but larvae were found by CDFG field crews within Lake Aloha itself in 2005 and 2008. The lake has subsequently been identified as a fish removal site. However, fish removal is not feasible by mechanical means alone due to the size and complexity of the lake. Furthermore CDFG acknowledges removing fish from Lake Aloha conflicts with public use. As a result, Lake Aloha will be managed as a self-sustaining brook trout fishery until such time that fish removal becomes feasible.

American Lake is directly downstream from Lake Aloha, below the EID dam. It was stocked primarily with brook trout from 1934 until 1987 which have established a self-sustaining population. Gill net data collected in 2008 indicate that brook trout persist in the lake. It is located within the Pyramid Creek PWS native species reserve and is designated by CDFG as a fish removal location. However, since it is downstream of Lake Aloha and is a self-sustaining fishery, fish removal could not begin until fish removal efforts at Lake Aloha are completed. Most importantly, the outlet offers fish unrestricted access to and from Channel Lake, Lake ID 14287 and Lake ID 14302. There are no significant impediments to fish movement until the small series of falls above Desolation Lake. Thus, any effort to eradicate fish at American Lake would have to include the three lakes just mentioned and the 400 meters (1,300 feet) of fish-bearing stream between them thereby requiring chemical treatment. As a result, American Lake will be managed as a self-sustaining brook trout fishery until such time that fish removal becomes feasible.

Avalanche Lake is the lowest lake in the Pyramid Creek lakes chain, directly above Horsetail Falls. It is frequented by day hikers who make the steep climb up the Horsetail Falls Trail. It has been stocked with brook trout from 1957 to 1968 and with rainbow trout from 1971 until 2000. CDFG has limited fisheries data for this lake and further monitoring is necessary to determine the status and health of the fishery. CDFG field crews did visually identify brook trout in 2008,

suggesting that brook trout are self-sustaining. Similar to the other lakes in the Pyramid Creek lakes chain, it lies within a native species reserve and is designated for fish removal. However, fish removal is not feasible at Avalanche Lake since it lies downstream of a long chain of self-sustaining brook trout populations which would have to be eradicated beforehand. As a result, it will be managed as a self-sustaining brook trout fishery until such time that fish removal is feasible.

Photo 19: Aerial photo of Lake Aloha looking north (1951 C.K. Fisher, CDFG)

Channel Lake is the next named lake below American Lake in the Pyramid Creek lakes chain. It has been stocked primarily with brook trout from 1932 until 1999. CDFG 2008 gill net data indicate the brook trout population is naturally reproducing and has a range of size classes. The lake will no longer be stocked and will be managed as a self-sustaining brook trout fishery. As described for American Lake, Channel Lake lies within the Pyramid Creek PWS native species reserve and is designated as a fish removal site although such a project could not be achieved by mechanical eradication techniques alone.

Desolation Lake is part of the Pyramid Creek lakes chain and lies downstream of Channel Lake. Much the same as the other lakes in the chain, it was stocked with brook trout from the 1930s until 1999. The brook trout reproduce naturally and have a range of size classes represented in the population. As a result, the management direction is identical to American Lake and the other lakes in the Pyramid Creek lakes chain. One difference between Desolation Lake and the rest of the lakes chain is that it is bracketed by significant fish barriers on the inlet

and outlet streams. Because of this, mechanical eradication of brook trout would be relatively easy within Desolation Lake itself. However, all waters upstream would need to be fishless before that eradication effort could proceed.

Lake of the Woods is one of the more popular overnight destinations in Desolation Wilderness and is known as a trophy rainbow trout fishery. It was originally stocked in 1951 with rainbow trout and brook trout in 1966. The lake was stocked regularly with both species until 2000 and 1998, respectively. Gill net samples have returned low numbers of very large rainbow trout (Photo 20) but no brook trout. One possibility is that rainbow trout can occasionally spawn in the lake's two small inlets during spring runoff. The inlets are typically dry in the fall when brook trout are ready to spawn. Although Lake of the Woods should receive supplemental rainbow trout stocking from a fisheries management perspective, the lake is near SNYLF breeding locations and is located within the Pyramid Creek PWS native species reserve. Instead, it has been designated as a fish removal site and will no longer be stocked. Fish removal at Lake of the Woods is likely feasible without chemical treatment, however CDFG recognizes public use conflicts with removing fish from one of the most visited lakes in the Desolation Wilderness. In the interim, it will be managed as a self-sustaining trophy rainbow trout fishery until such time that fish removal becomes a viable option.

Photo 20: A healthy 18 inch rainbow trout from Lake of the Woods (2008 Kim Milliron, CDFG)

Pitt Lake is directly upstream of Avalanche Lake and therefore is the second to last lake in the Pyramid Creek lakes chain. CDFG has no record of it ever being stocked. Gill net sets in 2003 did capture a few healthy brook trout. Further data collection is necessary to determine if natural reproduction occurs within the lake or if these fish are flushed downstream from Ropi Lake. The lake will not be stocked and it will be managed as a self-sustaining fishery. The lake is within the Pyramid Creek PWS native species reserve and is identified for fish removal,

however it is downstream of a long chain of self-sustaining brook trout fisheries that would need to be eradicated prior to any removal efforts at the lake.
Ropi Lake (Photo 21) is the second largest lake in the Pyramid Creek lakes chain and is a popular overnight destination for visitors of Desolation Valley who want to avoid the crowded areas around Lake Aloha and Lake of the Woods. It was stocked with brook trout from 1930 until 2000 and due to its location within the Pyramid Creek PWS native species reserve it will no longer be stocked. Gill net data collected in 2003 and 2008 indicate there is a low level of natural reproduction maintaining a low density brook trout population. As a result, this lake is known to be a challenging fishery. SNYLF were observed here in the early 1990s but have not been seen in subsequent surveys. The lake is designated as a fish removal site. Fish removal is not currently feasible due to the size of the lake and the chain of fish-bearing lakes upstream which would need to be eradicated prior to any removal efforts at the lake.

Photo 21: Ropi Lake looking west with Toem Lake in the background (2008 Michael Massoud, CDFG)

Toem Lake is a large lake immediately connected to Ropi Lake via a short, wide channel. It was stocked regularly with brook trout beginning in 1930 until it was switched to rainbow trout in 1974. There was a dam constructed in 1942 but it has since been partially deconstructed. As a result, fish may move unimpeded between Ropi Lake and Toem Lake. However, gill net sets in 2003 and 2008 returned no fish. CDFG believes that low numbers of brook trout move between the two lakes despite the gill net sample results. Similar to the other fish-bearing lakes in the PWS it is designated as a fish removal site but is not feasible due to connectivity to self-sustaining fish-bearing lakes. Until fish removal becomes viable it will be managed as a self-sustaining brook trout fishery.

Lake ID 14302 is an unnamed lake between Channel Lake and Desolation Lake. CDFG has no record of the lake ever being stocked. However, presence of brook trout was visually confirmed by CDFG field crews in 2003 and 2009. Lake ID 14302 will be managed as a self-sustaining brook trout fishery until such time that fish removal is feasible.

Table 40. Summary of herpetofauna survey data and management for Pyramid Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
Lake Aloha	14159.00	5-Jul-08	HYRE	0	0	0	469	0	Native species restoration - Category 3
			SNYLF	6	0	0	8	0	
			THEL	2	1	0	0	0	
American Lake	14261.00	3-Jul-08	ELCO	2	0	0	0	0	Native species restoration - Category 3
Avalanche Lake	14378.00	28-Aug-03	THEL	1	0	0	0	0	Native species restoration - Category 3
Channel Lake	14290.00	6-Jul-08	ELCO	0	1	0	0	0	Native species restoration - Category 3
			HYRE	0	0	0	82	0	
Desolation Lake	14314.00	26-Aug-03	HYRE	0	0	3	0	0	Native species restoration - Category 3
Frata Lake	14322.00	6-Jul-08	HYRE	0	0	0	25	0	Not actively managed
Gefo Lake	14335.00	27-Aug-03	HYRE	0	0	0	45	0	Native species restoration - Category 1
		29-Jul-05	THEL	1	0	0	0	0	
		6-Jul-08	SNYLF	2	0	0	0	0	
Lake of the Woods	14291.00	2-Jul-08	SNYLF	5	1	0	0	0	Native species restoration - Category 2
			THEL	1	0	0	0	0	
Osma Lake	14350.00	27-Aug-03	HYRE	0	2	0	0	0	Not actively managed
Pitt Lake	14364.00	7-Jul-08	THSP	1	0	0	0	0	Native species restoration - Category 3
Pyramid Lake	14309.00	6-Jul-08	HYRE	3	0	0	25	8	Native species restoration - Category 1
			SNYLF	17	13	1	1291	0	
			THEL	4	1	0	0	0	
Ropi Lake	14340.00	27-Aug-03	SNYLF	1	0	0	0	0	Native species restoration - Category 3
		7-Jul-08	CHBO	1	0	0	0	0	
		7-Jul-08	HYRE	0	0	0	985	0	
		7-Jul-08	THCO	2	0	0	0	0	
		7-Jul-08	THEL	3	0	0	0	0	

Table 40, Con't. Summary of herpetofauna survey data and management for Pyramid Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
Toem Lake	14337.00	7-Jul-08	HYRE	0	0	0	91	0	Native species restoration - Category 3
			THCO	0	1	0	0	0	
			THEL	1	0	0	0	0	
Waca Lake	14277.00	4-Jul-08	HYRE	0	0	0	0	6	Native species restoration - Category 1
			SNYLF	1	1	0	36	0	
	14153.00	14-Aug-03	HYRE	0	3	0	1200	0	Amphibian resource
			THCO	2	0	0	0	0	
	14159.01	5-Jul-08	SNYLF	0	2	0	0	0	Not actively managed
	14159.02	16-Aug-03	HYRE	0	0	100	405	0	Amphibian resource
			SNYLF	3	0	0	0	0	
			THEL	1	0	0	0	0	
	14159.03	4-Jul-08	HYRE	0	0	0	10	0	Amphibian resource
			SNYLF	2	0	0	0	0	
	14159.04	16-Aug-03	HYRE	0	15	80	90	0	Amphibian resource
	14207.00	17-Aug-03	HYRE	0	0	50	340	0	Amphibian resource
	14208.00	18-Aug-03	HYRE	0	0	0	410	0	Amphibian resource
	14213.00	17-Aug-03	HYRE	0	0	0	8	0	Amphibian resource
	14219.00	6-Jul-08	SNYLF	1	1	0	0	0	Not actively managed
	14221.00	6-Jul-08	SNYLF	28	72	0	380	27	Amphibian resource
		17-Aug-03	HYRE	0	0	0	76	0	
	14236.00	18-Aug-03	HYRE	0	0	0	48	0	Amphibian resource
	14240.00	3-Jul-08	HYRE	0	0	0	0	10	Amphibian resource
	14243.00	4-Jul-08	SNYLF	0	0	0	250	1	Amphibian resource
		15-Aug-03	THEL	1	0	0	0	0	
	14243.01	15-Aug-03	HYRE	0	0	250	0	0	Amphibian resource
	14245.00	12-Aug-04	AMMA	0	0	0	4	0	Amphibian resource
		3-Jul-08	HYRE	0	0	0	890	1	
	14246.00	15-Aug-03	HYRE	0	0	50	1200	0	Amphibian resource
		5-Jul-08	SNYLF	1	0	0	0	0	
	14246.01	5-Jul-08	HYRE	0	0	0	31	0	Amphibian resource
		28-Jul-05	SNYLF	1	0	0	0	0	
		15-Aug-03	THEL	1	0	0	0	0	
	14247.00	4-Jul-08	HYRE	0	0	0	57	0	Amphibian resource
	14251.00	3-Jul-08	HYRE	0	0	0	1	0	Amphibian resource
		15-Aug-03	THEL	1	0	0	0	0	
	14254.00	15-Aug-03	HYRE	0	0	20	115	0	Amphibian resource
	14257.00	3-Jul-08	HYRE	0	0	0	50	0	Amphibian resource
			THEL	2	0	0	0	0	

Table 40, Con't. Summary of herpetofauna survey data and management for Pyramid Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
	14260.00	3-Jul-08	HYRE	0	0	0	238	0	Amphibian resource
		12-Aug-04	AMMA	0	0	0	44	0	
			THEL	1	0	0	0	0	
	14262.00	18-Aug-03	HYRE	0	0	0	7	0	Amphibian resource
			THEL	1	0	0	0	0	
	14264.00	13-Aug-04	HYRE	0	0	3	7	0	Amphibian resource
	14265.00	2-Jul-08	HYRE	0	0	0	65	0	Amphibian resource
			SNYLF	2	1	0	0	0	
			THEL	1	0	0	0	0	
	14267.00	12-Aug-04	THEL	1	0	0	0	0	Amphibian resource
			AMMA	0	0	0	1	0	
		3-Jul-08	SNYLF	0	1	1	6	0	
			HYRE	0	0	0	1	0	
	14268.00	15-Aug-03	HYRE	0	0	0	6	0	Amphibian resource
	14269.00	14-Aug-03	HYRE	0	0	0	6	0	Amphibian resource
	14270.00	4-Jul-08	HYRE	0	0	0	1	2	Amphibian resource
	14273.00	15-Aug-03	HYRE	0	0	60	515	0	Amphibian resource
			THEL	1	1	0	0	0	
	14273.01	16-Aug-03	HYRE	0	0	108	15	0	Amphibian resource
	14276.00	14-Aug-03	HYRE	0	0	0	27	0	Amphibian resource
			SNYLF	1	0	0	0	0	
		5-Jul-08	THEL	1	0	0	0	0	
	14280.00	14-Aug-03	HYRE	0	0	8	12	0	Amphibian resource
			THEL	2	0	0	0	0	
	14282.00	3-Jul-08	SNYLF	0	3	0	2	0	Amphibian resource
			THSI	2	0	0	0	0	
	14283.00	3-Jul-08	SNYLF	0	0	1	6	0	Amphibian resource
		14-Aug-03	HYRE	0	0	33	105	0	
			THEL	0	1	0	0	0	
	14287.00	3-Jul-08	ELCO	1	0	0	0	0	Native species restoration - Category 3
	14292.00	3-Jul-08	SNYLF	0	2	0	55	0	Amphibian resource
		15-Aug-03	HYRE	5	0	0	317	1	
			THEL	3	0	0	0	0	
	14294.00	3-Jul-08	SNYLF	1	1	0	10	0	Amphibian resource
	14298.00	3-Jul-08	HYRE	0	0	0	20	0	Amphibian resource
			SNYLF	0	1	0	0	0	
			THEL	1	0	0	0	0	

Table 40, Con't. Summary of herpetofauna survey data and management for Pyramid Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
	14300.00	3-Jul-08	SNYLF	0	0	0	6	0	Amphibian resource
	14300.01	3-Jul-08	HYRE	0	0	0	33	0	Not actively managed
		26-Aug-03	SNYLF	1	0	0	0	0	
			THEL	0	1	0	0	0	
	14302.00	16-Aug-03	HYRE	0	0	20	200	0	Native species restoration - Category 3
	14303.00	5-Jul-08	SNYLF	0	1	0	0	0	Amphibian resource
	14303.01	17-Aug-03	HYRE	0	0	0	12	0	Amphibian resource
			SNYLF	2	0	0	5	0	
	14305.00	16-Aug-03	SNYLF	0	0	20	250	0	Amphibian resource
	14306.00	29-Jul-05	THEL	1	0	0	0	0	Amphibian resource
		5-Jul-08	SNYLF	3	1	1	141	3	
			HYRE	0	0	0	6	0	
			THSI	1	0	0	0	0	
	14307.00	16-Aug-03	HYRE	2	0	18	530	0	Amphibian resource
	14308.00	3-Jul-08	SNYLF	0	1	0	7	0	Amphibian resource
		26-Aug-03	HYRE	1	0	40	0	0	
		30-Jul-05	THEL	2	0	0	0	0	
	14308.01	18-Aug-03	HYRE	0	0	17	80	0	Amphibian resource
		3-Jul-08	SNYLF	0	4	0	0	0	
	14309.01	29-Jul-05	SNYLF	1	0	0	0	0	Not actively managed
	14310.00	29-Jul-05	HYRE	0	0	0	70	0	Amphibian resource
		5-Jul-08	SNYLF	0	1	0	0	0	
	14312.00	5-Jul-08	SNYLF	1	1	0	37	0	Amphibian resource
		29-Jul-05	HYRE	0	0	0	28	0	
	14316.00	26-Aug-03	HYRE	0	0	6	0	0	Amphibian resource
		6-Jul-08	SNYLF	1	1	0	0	0	
			THEL	1	0	0	0	0	
	14319.00	6-Jul-08	HYRE	0	0	0	10	0	Native species restoration - Category 3
	14324.01	26-Aug-03	HYRE	0	0	0	150	0	Amphibian resource
	14328.00	6-Jul-08	HYRE	0	0	0	10	0	Amphibian resource
		26-Aug-03	THEL	1	0	0	0	0	
	14335.01	27-Aug-03	HYRE	0	0	150	50	0	Amphibian resource

Table 40, Con't. Summary of herpetofauna survey data and management for Pyramid Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
	14341.00	29-Jul-05	SNYLF	0	0	0	4	0	Native species restoration - Category 1
	14345.00	6-Jul-08	SNYLF	0	1	0	21	0	Amphibian resource
			HYRE	0	0	0	9	0	
		29-Jul-05	THCO	1	0	0	0	0	
	14348.00	6-Jul-08	HYRE	0	0	0	45	0	Amphibian resource
			SNYLF	3	0	0	0	0	
	14348.01	29-Jul-05	HYRE	0	0	0	4	0	Amphibian resource
		27-Aug-03	SNYLF	1	0	0	0	0	
	14356.00	6-Jul-08	SNYLF	0	5	0	6	0	Amphibian resource
		27-Aug-03	HYRE	0	1	0	0	0	
	14357.00	7-Jul-08	HYRE	0	0	0	2	0	Not actively managed
		28-Aug-03	THCO	1	0	0	0	0	
			THEL	1	0	0	0	0	
	14359.00	28-Aug-03	THCO	1	0	0	0	0	Not actively managed
		7-Jul-08	HYRE	0	0	0	1	0	
			THEL	1	0	0	0	0	
	14365.00	7-Jul-08	SNYLF	0	1	0	3	0	Not actively managed
		27-Aug-03	HYRE	0	0	1	0	0	
	14366.00	27-Aug-03	HYRE	1	0	3	0	0	Not actively managed
	14369.00	7-Jul-08	HYRE	0	0	0	130	0	Amphibian resource
			THEL	2	1	0	0	0	
	14375.00	7-Jul-08	HYRE	0	0	0	24	0	Amphibian resource
	14379.00	7-Jul-08	THCO	1	0	0	0	0	Not actively managed
	14380.00	7-Jul-08	THCO	1	0	0	0	0	Not actively managed
	14380.01	28-Aug-03	HYRE	0	0	7	0	0	Not actively managed
	14383.00	7-Jul-08	HYRE	0	0	0	16	0	Not actively managed
			THCO	1	0	0	0	0	
	14385.00	7-Jul-08	HYRE	0	0	0	26	0	Amphibian resource
			THCO	1	0	0	0	0	
		28-Aug-03	THEL	1	0	0	0	0	
	14387.00	28-Aug-03	THCO	1	0	0	0	0	Amphibian resource
		7-Jul-08	HYRE	0	0	0	0	4	
			THEL	1	0	0	0	0	

Table 40, Con't. Summary of herpetofauna survey data and management for Pyramid Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
	25936.00	3-Jul-08	HYRE	0	0	0	15	0	Amphibian resource
		12-Aug-04	AMMA	0	0	0	1	0	
			THEL	1	0	0	0	0	
	50104.00	3-Jul-08	SNYLF	0	2	0	0	0	Not actively managed
	50353.00	6-Jul-08	HYRE	0	0	0	150	0	Amphibian resource
			SNYLF	1	0	0	0	0	
	50354.00	5-Jul-08	SNYLF	0	0	0	2	0	Amphibian resource
	50380.00	4-Jul-08	SNYLF	1	0	0	0	0	Not actively managed

Table 41. Summary of fish population data for Pyramid Creek PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Lake Aloha	14159.00	5-Jul-08	BK	yes	61	266	251	1.093
American Lake	14261.00	3-Jul-08	BK	yes	56	218	121	0.929
Avalanche Lake	14378.00	7-Jul-08	BK	yes				
Channel Lake	14290.00	6-Jul-08	BK	yes	20	211	100	0.916
Desolation Lake	14314.00	26-Aug-03	BK	yes	14	192	98	1.103
Frata Lake	14322.00	26-Aug-03	None					
Gefo Lake	14335.00	6-Jul-08	BK	yes	20	273	242	1.128
Lake of the Woods	14291.00	2-Jul-08	RT	unknown	6	493	1246	1.045
Osma Lake	14350.00	27-Aug-03	None					
Pitt Lake	14364.00	28-Aug-03	BK	yes	6	231	131	1.040
Pyramid Lake	14309.00	6-Jul-08	None					
Ropi Lake	14340.00	7-Jul-08	BK	yes	8	282	301	1.243
Toem Lake	14337.00	7-Jul-08	None					
Waca Lake	14277.00	4-Jul-08	None					
	14287.00	3-Jul-08	BK	yes				
	14302.00	16-Aug-03	BK	yes				
	14324.00	6-Jul-08	BK	yes				

Table 42. Summary of fisheries management information for Pyramid Creek PWS.

Lake Name	Lake ID	First Recorded Stocking	Last Recorded Stocking	Pre-Survey Allotments	Current Proposed Allotment	Management Direction
Lake Aloha	14159.00	1930 - BK 1966 - RT	2000 - BK 1968 - RT	15000 BK ANN	DNP	Native species restoration - Category 3
American Lake	14261.00	1934 - BK 1966 - RT	1987 - BK 1967 - RT	DNP	DNP	Native species restoration - Category 3
Avalanche Lake	14378.00	1957 - BK 1971 - RT	1968 - BK 2000 - RT	250 RT ANN	DNP	Native species restoration - Category 3
Channel Lake	14290.00	1932 - BK 1966 - RT	1999 - BK 1967 - RT	DNP	DNP	Native species restoration - Category 3
Desolation Lake	14314.00	1930 - BK 1966 - RT	1999 - BK 1971 - RT	500 BK BNO	DNP	Native species restoration - Category 3
Frata Lake	14322.00	1952 - BK	1986 - BK	DNP	DNP	Not actively managed
Gefo Lake	14335.00	1930 - BK	1999 - BK	500 BK BNO	DNP	Native species restoration - Category 1
Lake of the Woods	14291.00	1966 - BK 1951 - RT	1998 - BK 2000 - RT	5000 RT ANN	DNP	Native species restoration - Category 2
Osma Lake	14350.00	1930 - BK	1938 - BK	DNP	DNP	Not actively managed
Pitt Lake	14364.00			DNP	DNP	Native species restoration - Category 3
Pyramid Lake	14309.00	1930 - BK 1971 - GT 1969 - RT	1999 - BK 1994 - GT 1974 - RT	1000 BK ANN	DNP	Native species restoration - Category 1
Ropi Lake	14340.00	1930 - BK 1966 - RT	2000 - BK 1985 - RT	2000 BK BNE	DNP	Native species restoration - Category 3
Toem Lake	14337.00	1936 - BK 1968 - RT	1973 - BK 2000 - RT	1000 RT ANN	DNP	Native species restoration - Category 3
Waca Lake	14277.00	1931 - BK	1998 - BK	1000 BK ANN	DNP	Native species restoration - Category 1

Table 42, Con't. Summary of fisheries management information for Pyramid Creek PWS.

Lake Name	Lake ID	First Recorded Stocking	Last Recorded Stocking	Pre-Survey Allotments	Current Proposed Allotment	Management Direction
	14287.00					Native species restoration - Category 3
	14302.00					Native species restoration - Category 3
	14324.00					Native species restoration - Category 3

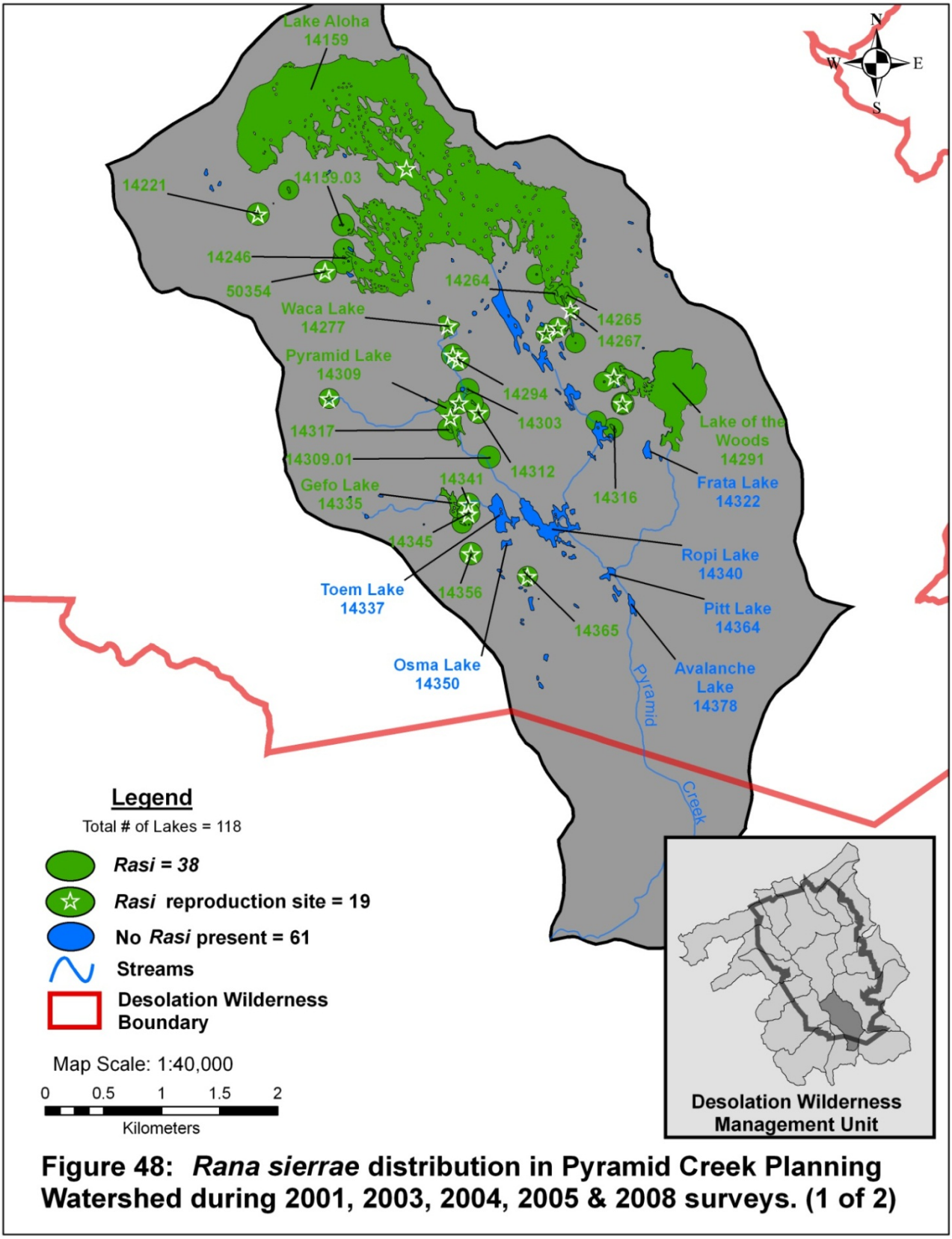

Figure 48: *Rana sierrae* distribution in Pyramid Creek Planning Watershed during 2001, 2003, 2004, 2005 & 2008 surveys. (1 of 2)

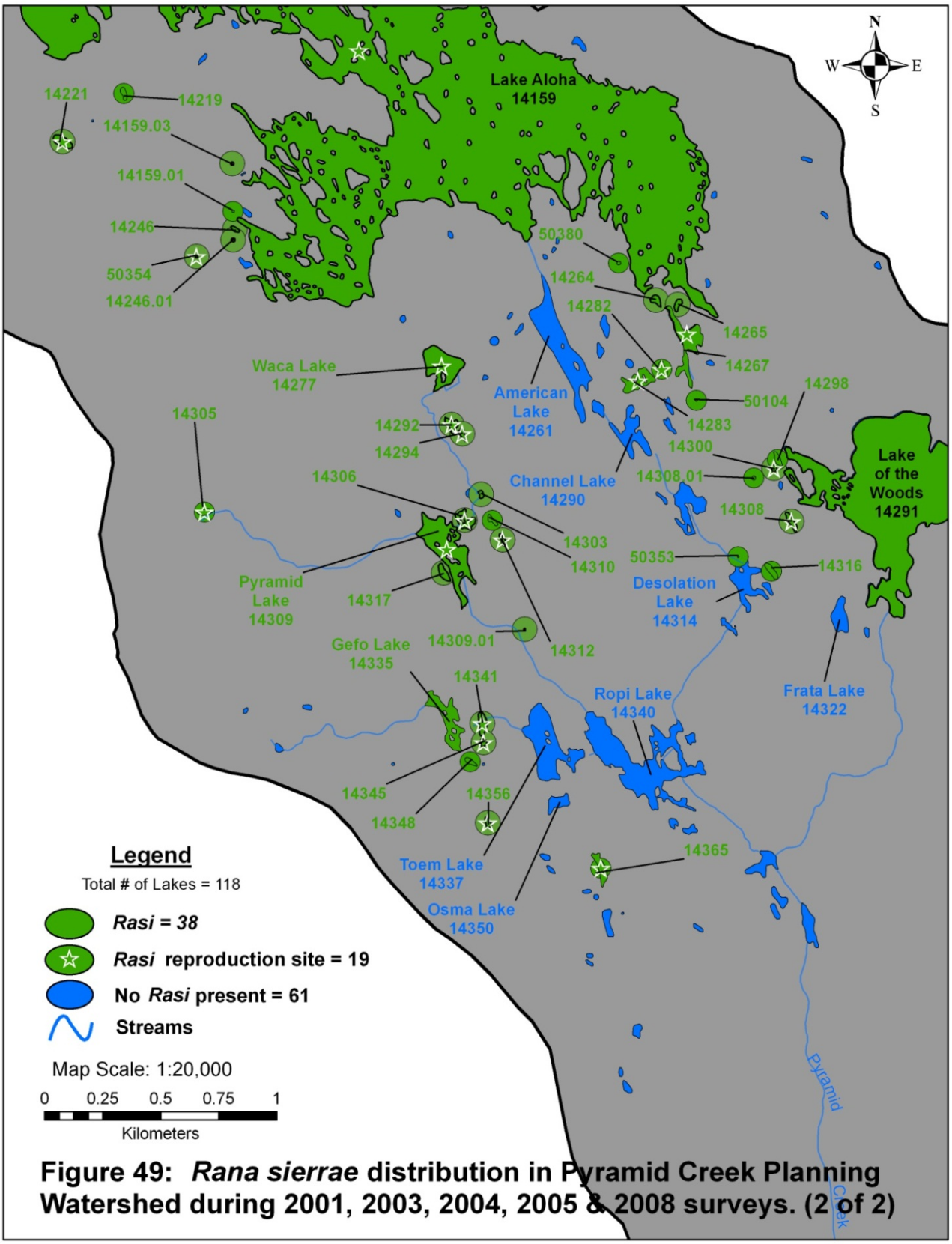

Figure 49: *Rana sierrae* distribution in Pyramid Creek Planning Watershed during 2001, 2003, 2004, 2005 & 2008 surveys. (2 of 2)

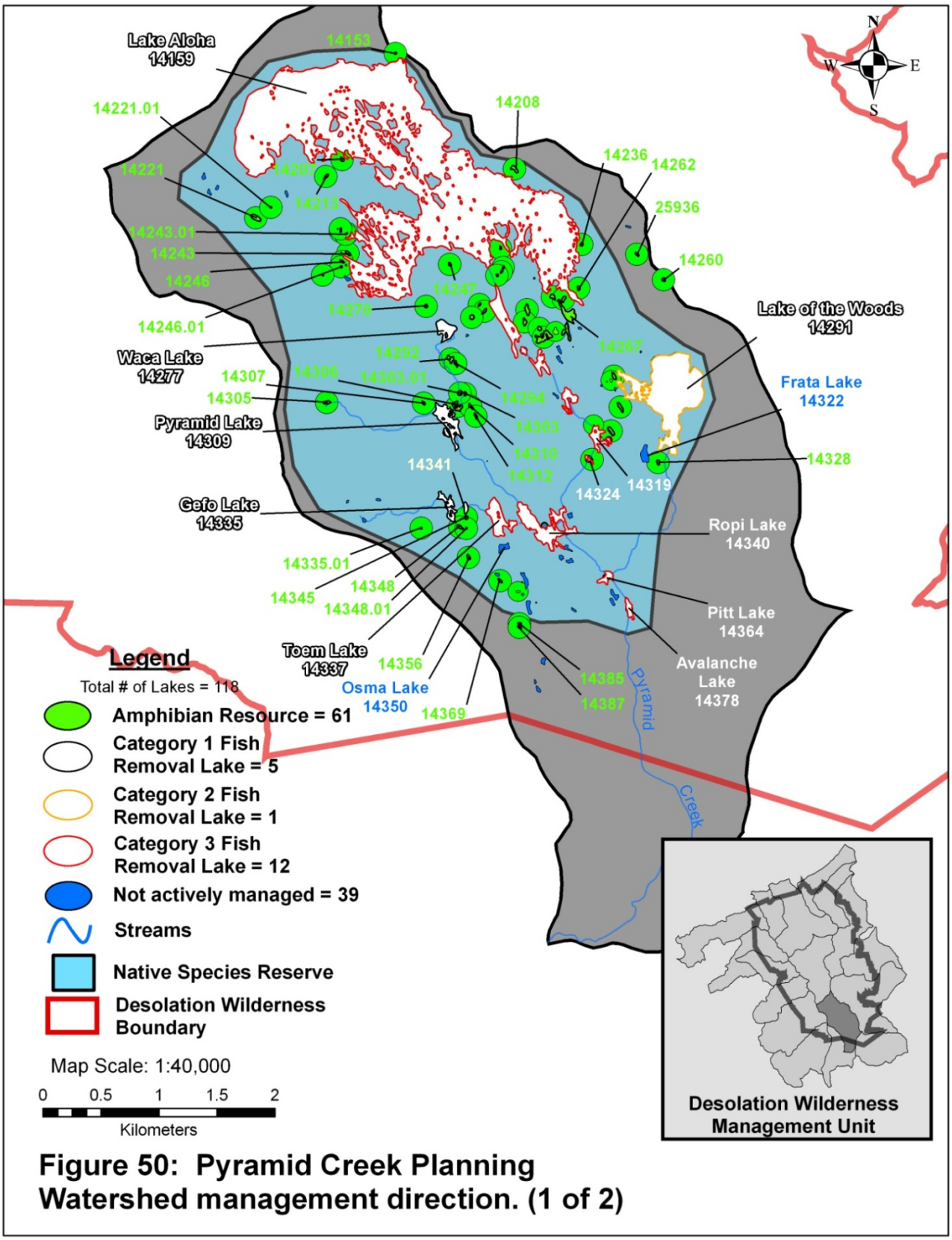

Figure 50: Pyramid Creek Planning Watershed management direction. (1 of 2)

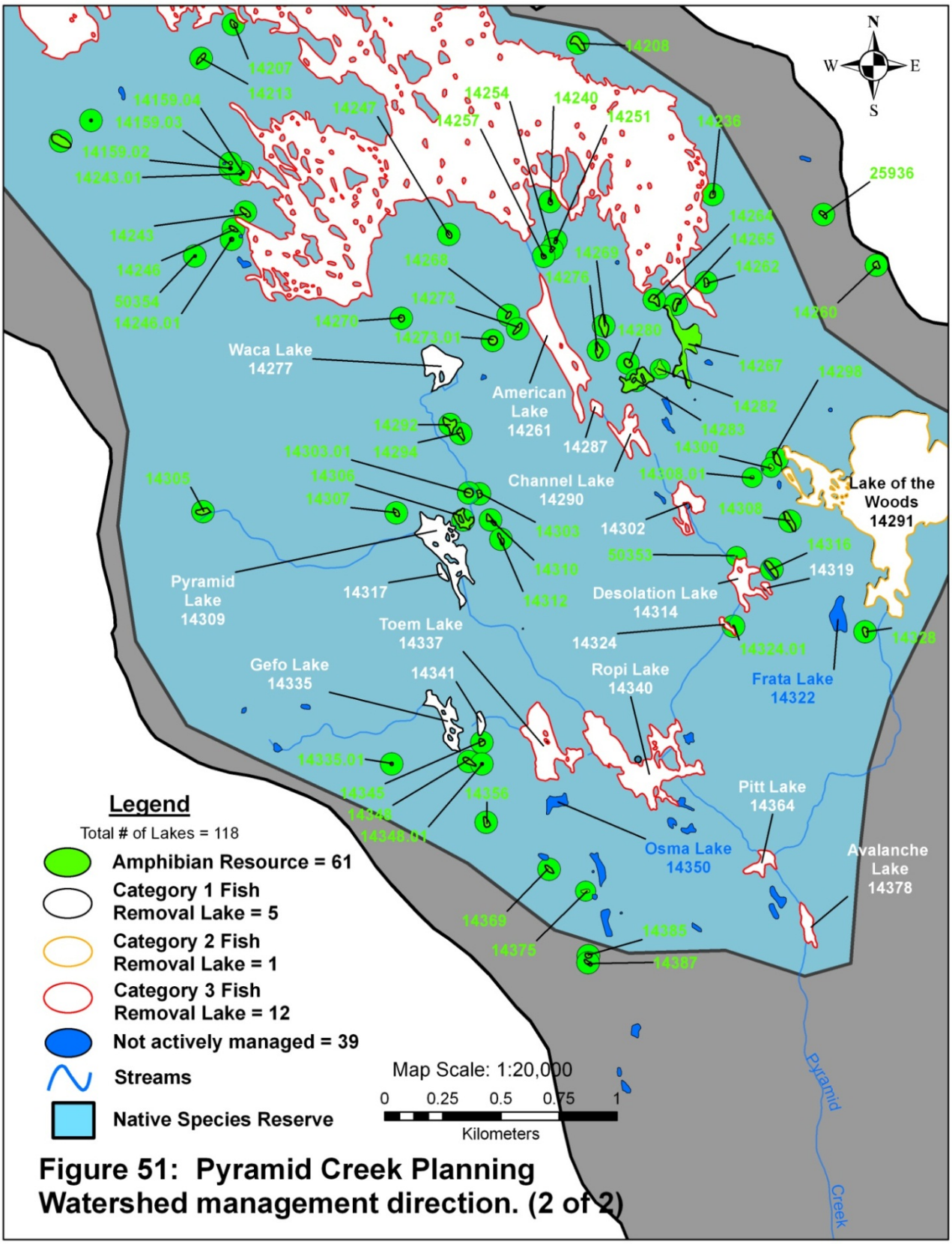

Figure 51: Pyramid Creek Planning Watershed management direction. (2 of 2)

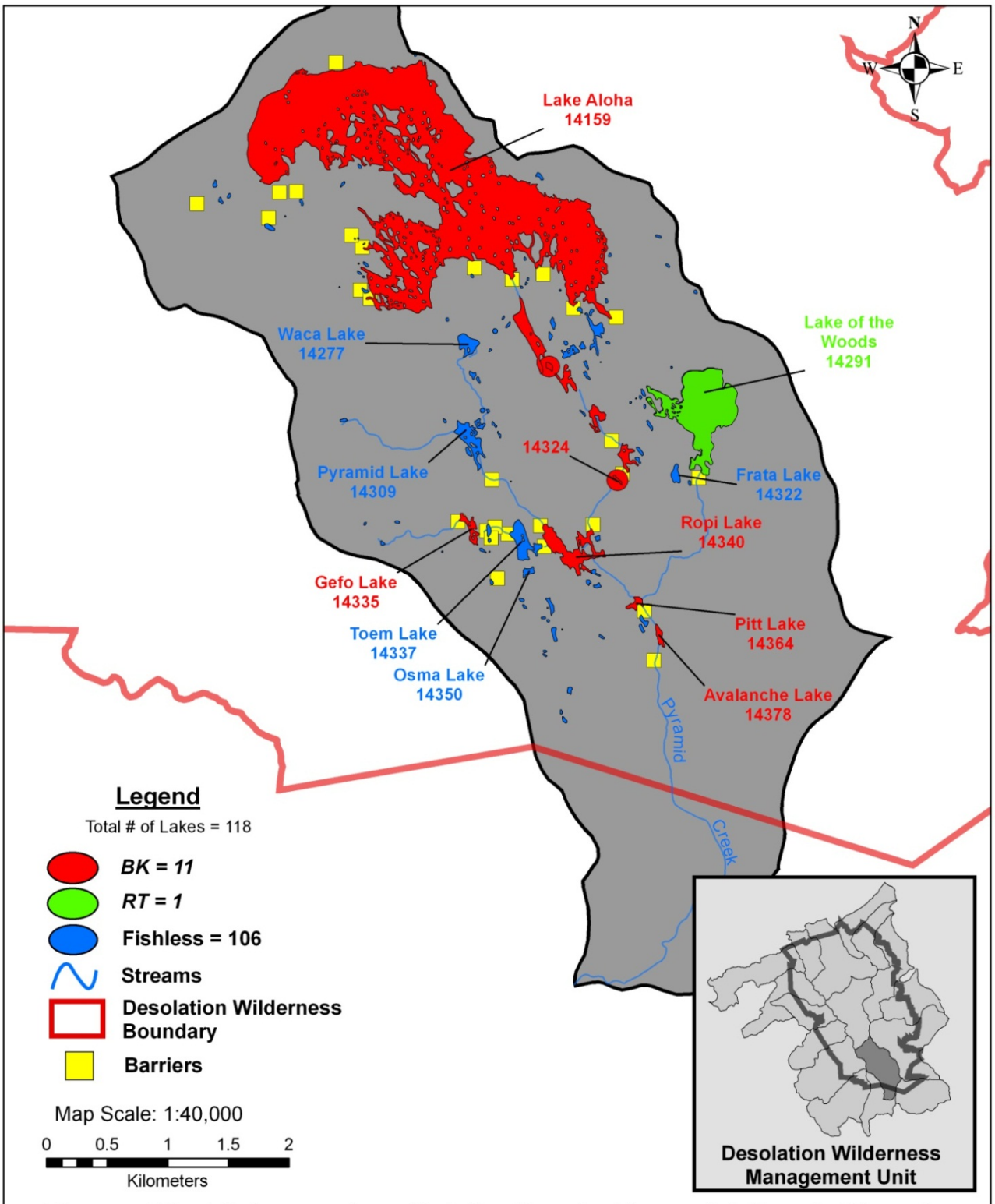

Figure 52: Fish species distribution in Pyramid Creek Planning Watershed during 2001, 2003, 2004 and 2005 surveys. (1 of 2)

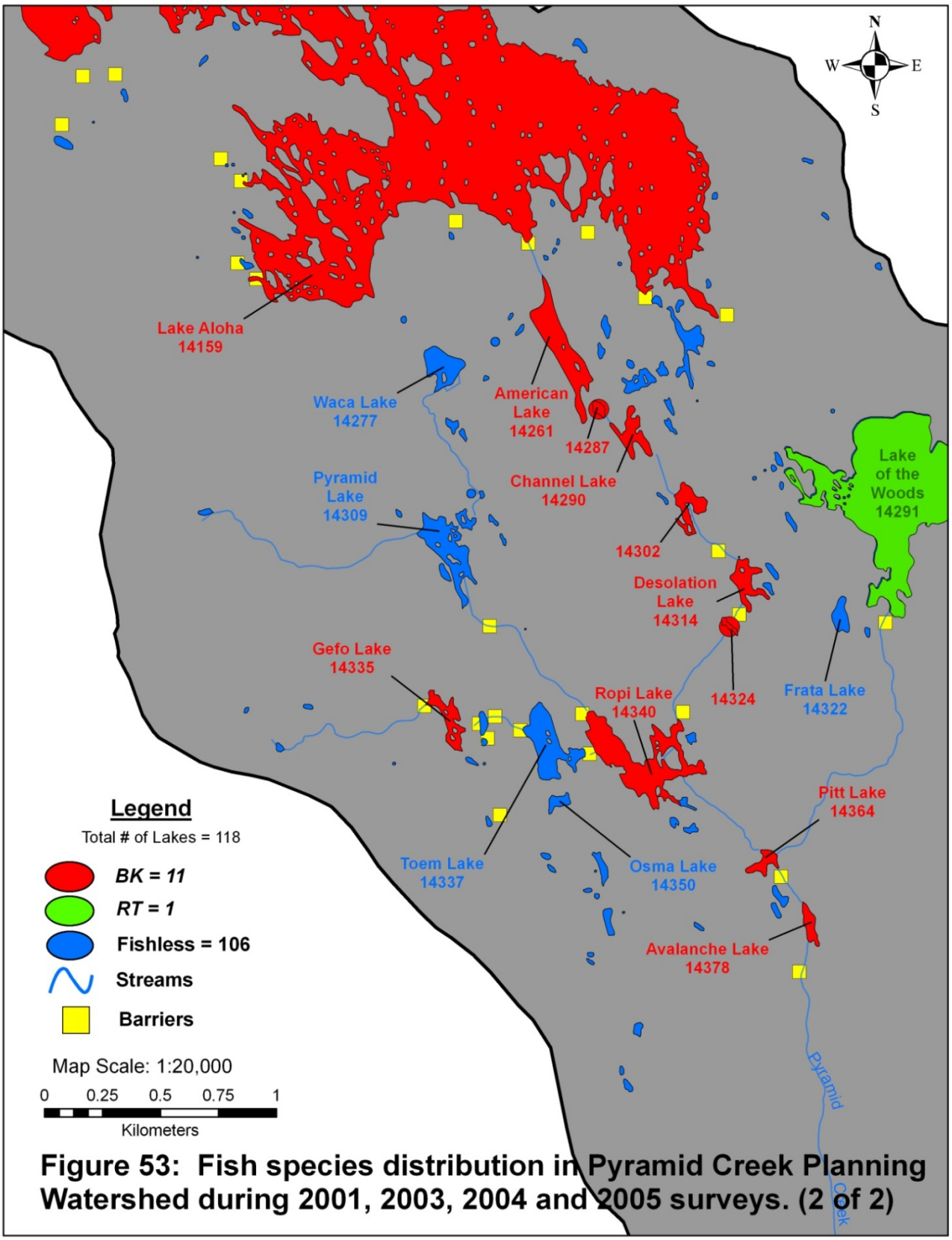

Figure 53: Fish species distribution in Pyramid Creek Planning Watershed during 2001, 2003, 2004 and 2005 surveys. (2 of 2)

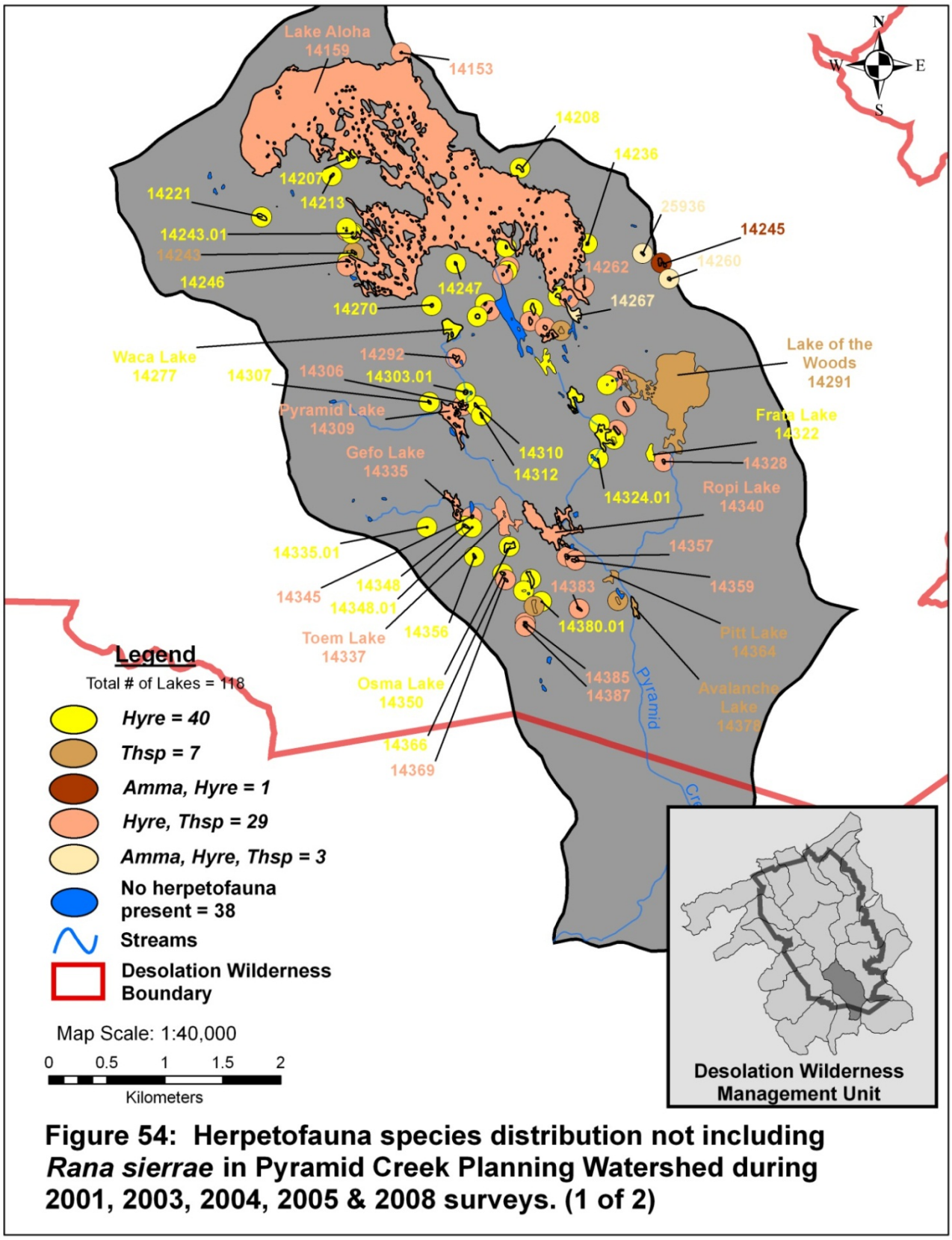

Figure 54: Herpetofauna species distribution not including *Rana sierrae* in Pyramid Creek Planning Watershed during 2001, 2003, 2004, 2005 & 2008 surveys. (1 of 2)

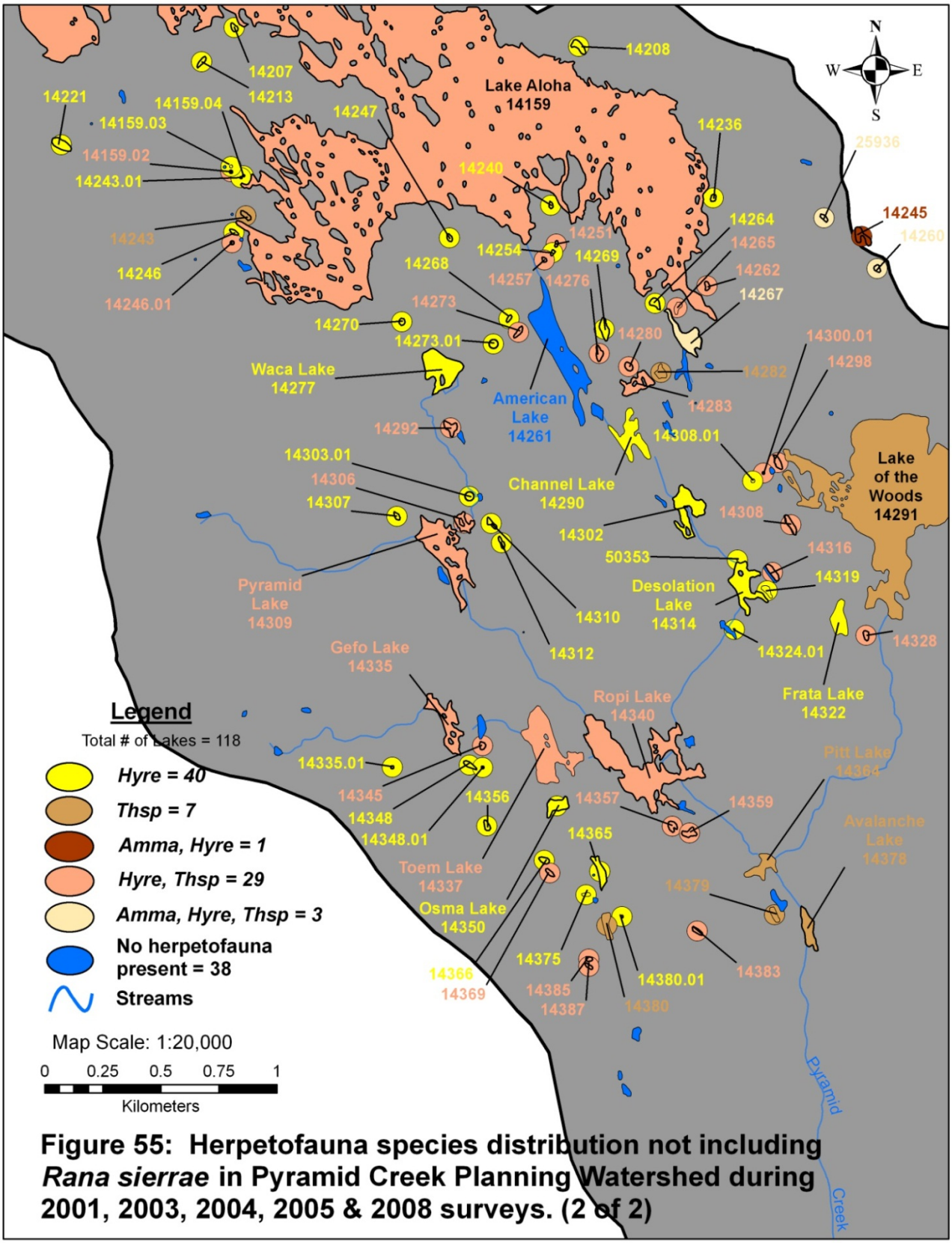

Figure 55: Herpetofauna species distribution not including *Rana sierrae* in Pyramid Creek Planning Watershed during 2001, 2003, 2004, 2005 & 2008 surveys. (2 of 2)

15) ROCKBOUND LAKE PLANNING WATERSHED MANAGEMENT DIRECTION

Rockbound Lake PWS naturally flows north from Desolation Wilderness into the Rubicon River and is part of the Middle Fork American River watershed. However, a significant amount of water is transported through this PWS as part of a larger diversion which moves water from the Rubicon River at Rubicon Reservoir via an aqueduct into Rockbound Lake and Buck Island Lake and finally to Loon Lake in the South Fork American River watershed via a second aqueduct. This is part of the Upper American River hydroelectric project (FERC No. 2101). Five named lakes and 31 unnamed waters are found within the PWS. The PWS is accessed by vehicle using the Rubicon OHV Trail or by foot and horseback using the Rubicon Trail from Loon Lake.

Table 43 provides summary data for amphibian resources and management in the Rockbound Lake PWS. Table 44 provides a summary of fish population data for the Rockbound Lake PWS. Table 45 provides a summary of fisheries management for the Rockbound Lake PWS. Figure 56 provides herpetofauna species distribution for the Rockbound Lake PWS. Figure 57 provides the management direction for the Rockbound Lake PWS. Figure 58 provides fish species distribution for the Rockbound Lake PWS.

Herpetofauna Resources and Management

Surveys in the 1990s by Eldorado National Forest personnel found SNYLF within the Rockbound Lake PWS at Highland Lake and Lake ID's 13878, 13879, 13896 and 13903. Subsequent surveys by CDFG in 2003 and 2008 found SNYLF at Highland Lake and Lake ID 13896. Due to the presence of breeding SNYLF, CDFG has designated the upper basin of Rockbound Lake PWS as a native species reserve.

AMMA were observed by CDFG at Lake ID 13842 in 2004 and at Lake ID 13844 in 1996 by Eldorado National Forest personnel. Both unnamed ponds will be managed as amphibian resources.

Highland Lake was stocked with rainbow trout from 1936 until 2000 and had a tendency to grow large fish. The lake has limited spawning habitat and the rainbow trout exhibited very little natural reproduction. A dam was constructed at the outlet in 1955 forming an effective barrier for fish moving from the outlet stream into the lake thereby reducing spawning potential further. Gill net surveys in 2003 and 2010 indicate rainbow trout persist in low numbers in the absence of stocking. As a result, CDFG will eradicate the remaining fish and the lake will be managed as an SNYLF breeding resource.

Lake ID 13903 and Lake ID 13896 are two small lakes directly downstream from Highland Lake. Lake ID 13896 is an SNYLF breeding location and Lake ID

13903 had sightings of larvae in the 1990s although current surveys had no detections. Gill net surveys in 2010 indicate rainbow trout are present in the ponds and the stream reaches in between. CDFG will eradicate the low density trout population using gill nets and backpack electrofishers. Once fishless, the ponds will be managed as SNYLF breeding resources.

Fisheries Resources and Management

Buck Island Lake is a large lake with a managed water level and is part of the larger water diversion from Rubicon River to Loon Lake as part of the Upper American River hydroelectric project (FERC No. 2101). The lake was initially stocked with brook trout in 1934 and stocked regularly during the following decades. In 1957 the lake was chemically treated to eradicate Sacramento suckers and was subsequently restocked with brook trout. Rainbow trout were added in 1966, however stocking of both species was halted in 1976. It is important to note that CDFG has no data about the species composition of the lake and more species are likely present than are represented in the stocking record. In any case, it will continue to be managed as a self-sustaining fishery.

Fawn Lake was originally stocked with brook trout in 1934 but has been stocked with rainbow trout from 1974 until 2000. Neither species reproduces naturally in the lake therefore brook trout are no longer present in the fishery. Gill net surveys in 2003 returned only two large rainbow trout and it is likely the lake has gone fishless in the absence of stocking. Although it is not directly on a trail, it is near Rubicon Springs which receives heavy visitation. As a result, Fawn Lake will be stocked again and managed as a put-and-grow trophy rainbow trout fishery.

Rockbound Lake is another large lake which is part of the water diversion from Rubicon River to Loon Lake as part of the Upper American River hydroelectric project (FERC No. 2101). It was stocked initially with brown trout and rainbow trout in 1930. Brook trout were eventually added in 1939 until 1965. Although 1930 was the only brown trout stocking recorded by CDFG, rainbow trout continued to be stocked until 2007. Brook trout and brown trout are self-sustaining and have turned up in angler surveys. Rainbow trout are also likely self-sustaining; however, aerial stocking will continue to supplement this high use fishery.

Winifred Lake is easily accessible from Loon Lake and was historically managed as a put-and-grow fishery receiving both brook trout and rainbow trout. Brook trout were originally stocked in 1934 and continued with little interruption until 1996. Rainbow trout were originally stocked in 1969 and 1970 but were not stocked again until 1997. Neither species reproduces naturally as evidenced by gill net data collected in 2003. Stocking will continue in order to manage this lake as a trail-accessible put-and-grow rainbow trout fishery.

Table 43. Summary of herpetofauna survey data and management for Rockbound Lake PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
Highland Lake	13904.00	20-Jul-08	SNYLF	0	0	0	19	0	Native species restoration - Category 1
Lake Winifred	13778.00	17-Aug-04	HYRE	2	0	0	0	0	Stocked lake
Rockbound Lake	13780.00	20-Jul-03	THCO	2	0	0	0	0	Stocked lake
	13778.01	17-Aug-04	HYRE	4	0	62	3	0	Amphibian resource
	13779.01	7-Jul-03	HYRE	0	0	0	12	0	Amphibian resource
	13784.00	17-Aug-04	HYRE	2	0	0	0	0	Not actively managed
	13788.00	19-Jul-03	THEL	2	0	0	0	0	Not actively managed
	13793.00	16-Aug-04	HYRE	0	0	0	1	0	Not actively managed
	13795.00	19-Jul-03	THEL	2	0	0	0	0	Not actively managed
	13807.00	16-Aug-04	HYRE	0	0	0	22	0	Amphibian resource
	13824.00	16-Aug-04	HYRE	0	0	2	6	0	Amphibian resource
	13842.00	16-Aug-04	HYRE	4	0	60	10	0	Amphibian resource
			AMMA	0	0	0	2	0	
	13844.00	16-Aug-04	HYRE	1	0	0	0	0	Amphibian resource
	13863.00	16-Aug-04	HYRE	7	0	44	182	0	Amphibian resource
	13878.00	20-Jul-08	HYRE	0	0	0	375	0	Amphibian resource
	13879.00	20-Jul-08	HYRE	0	0	0	85	0	Amphibian resource
	13892.00	20-Jul-08	HYRE	0	0	0	13	0	Amphibian resource
	13896.00	19-Jul-08	SNYLF	0	0	0	220	0	Native species restoration- Category 1

Table 44. Summary of fish population data for Rockbound Lake PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Buck Island Lake	13773.00	19-Jul-03	BK	yes				
Fawn Lake	13764.00	19-Jul-03	RT	no	2	293	192	0.763
Highland Lake	13904.00	20-Jul-08	None					
Lake Winifred	13778.00	17-Aug-04	RT	no	1	379	580	1.065
Rockbound Lake	13780.00	20-Jul-03	RT	unknown				

Table 45. Summary of fisheries management information for Rockbound Lake PWS.

Lake Name	Lake ID	First Recorded Stocking	Last Recorded Stocking	Pre-Survey Allotments	Current Proposed Allotment	Management Direction
Buck Island Lake	13773.00	1934 - BK 1966 - RT	1976 - BK 1975 - RT	DNP	DNP	Self-sustaining fishery
Fawn Lake	13764.00	1934 - BK 1968 - RT	1964 - BK 2000 - RT	1000 RT ANN	1000 RT ANN	Stocked lake
Highland Lake	13904.00	1936 - RT	2000 - RT	1000 RT ANN	DNP	Native species restoration - Category 1
Lake Winifred	13778.00	1934 - BK 1969 - RT	1996 - BK 2002 - RT	1000 RT ANN	500 RT ANN	Stocked lake
Rockbound Lake	13780.00	1939 - BK 1930 - RT	1965 - BK 2007 - RT	8000 RT ANN	8000 RT ANN	Stocked lake

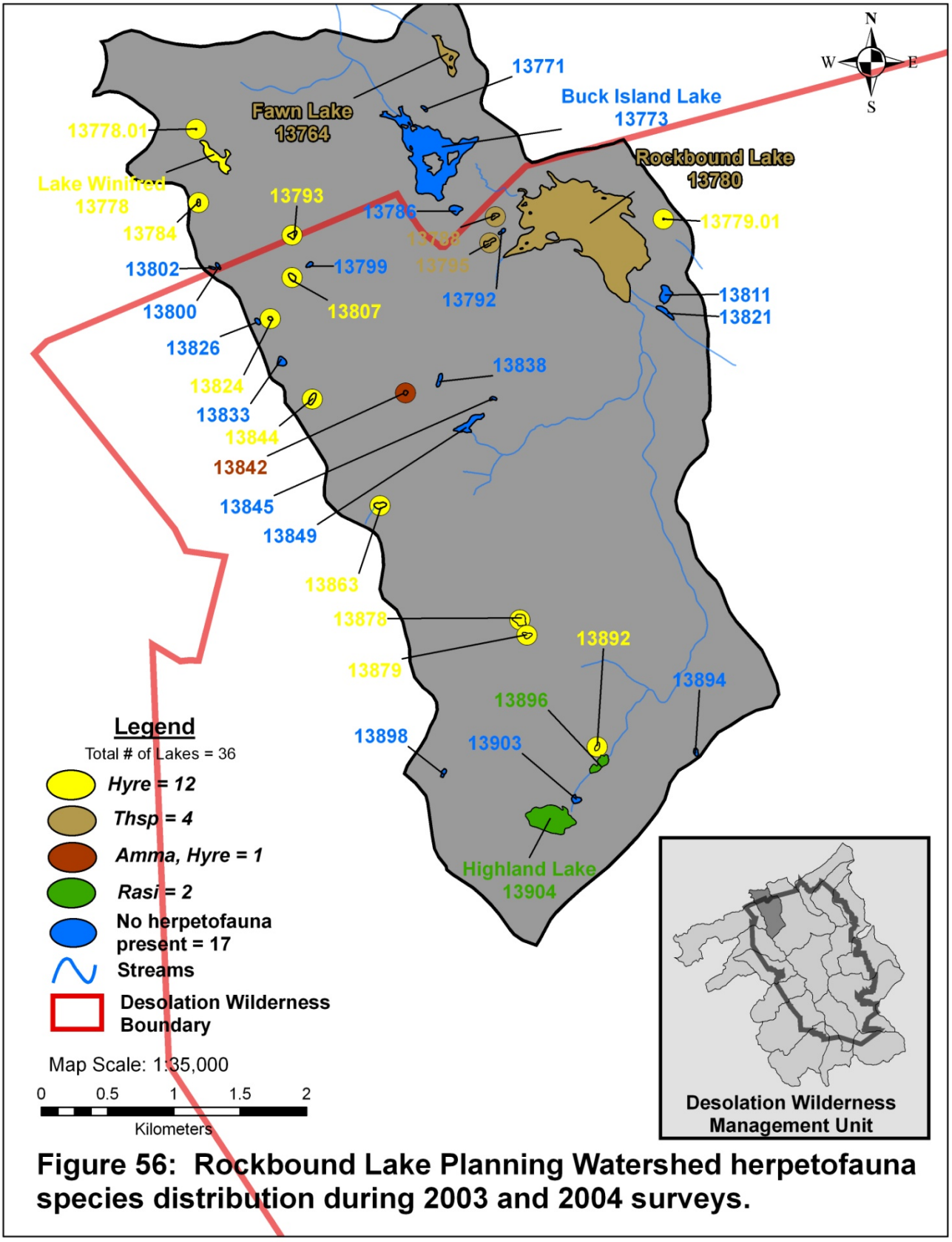

Figure 56: Rockbound Lake Planning Watershed herpetofauna species distribution during 2003 and 2004 surveys.

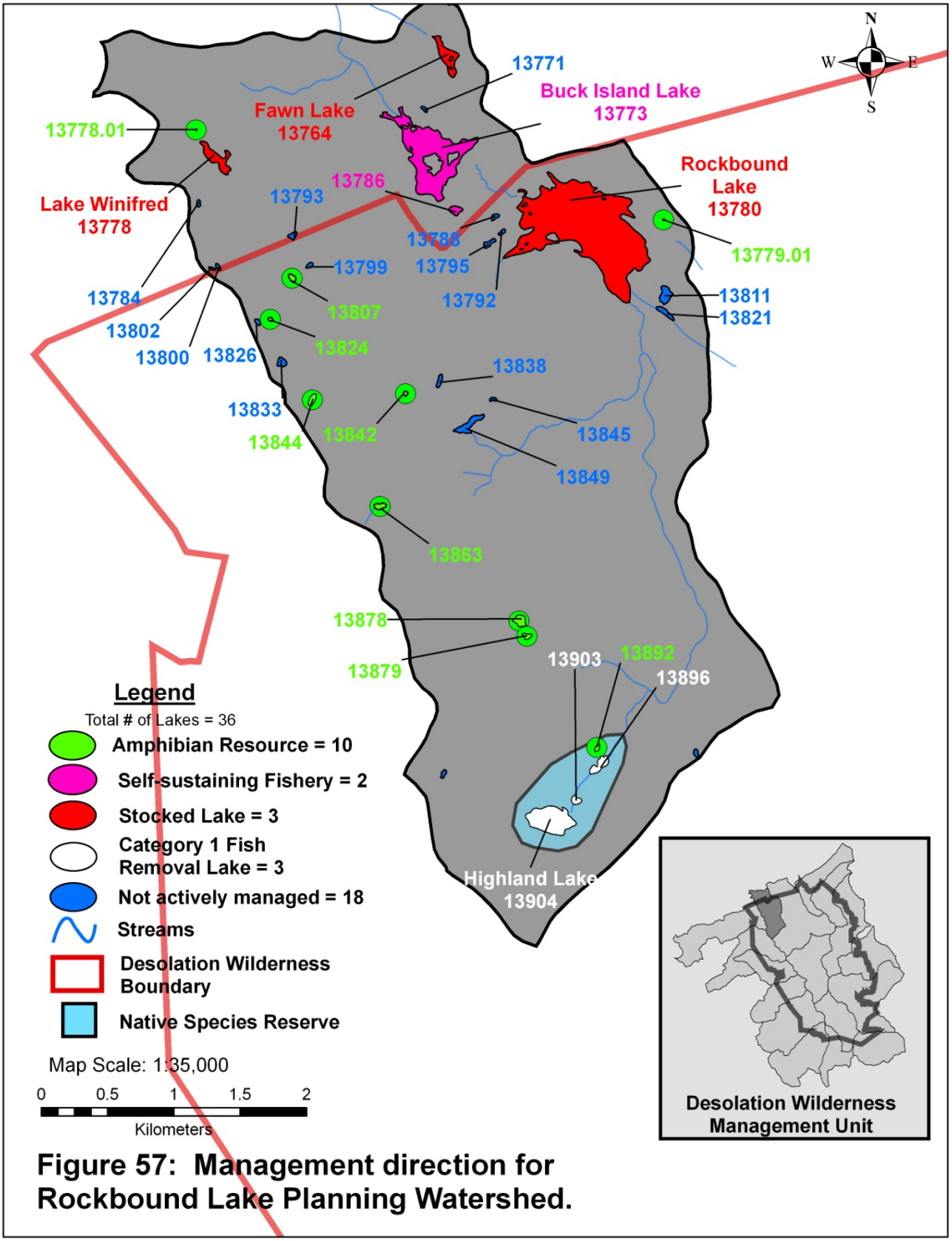

Figure 57: Management direction for Rockbound Lake Planning Watershed.

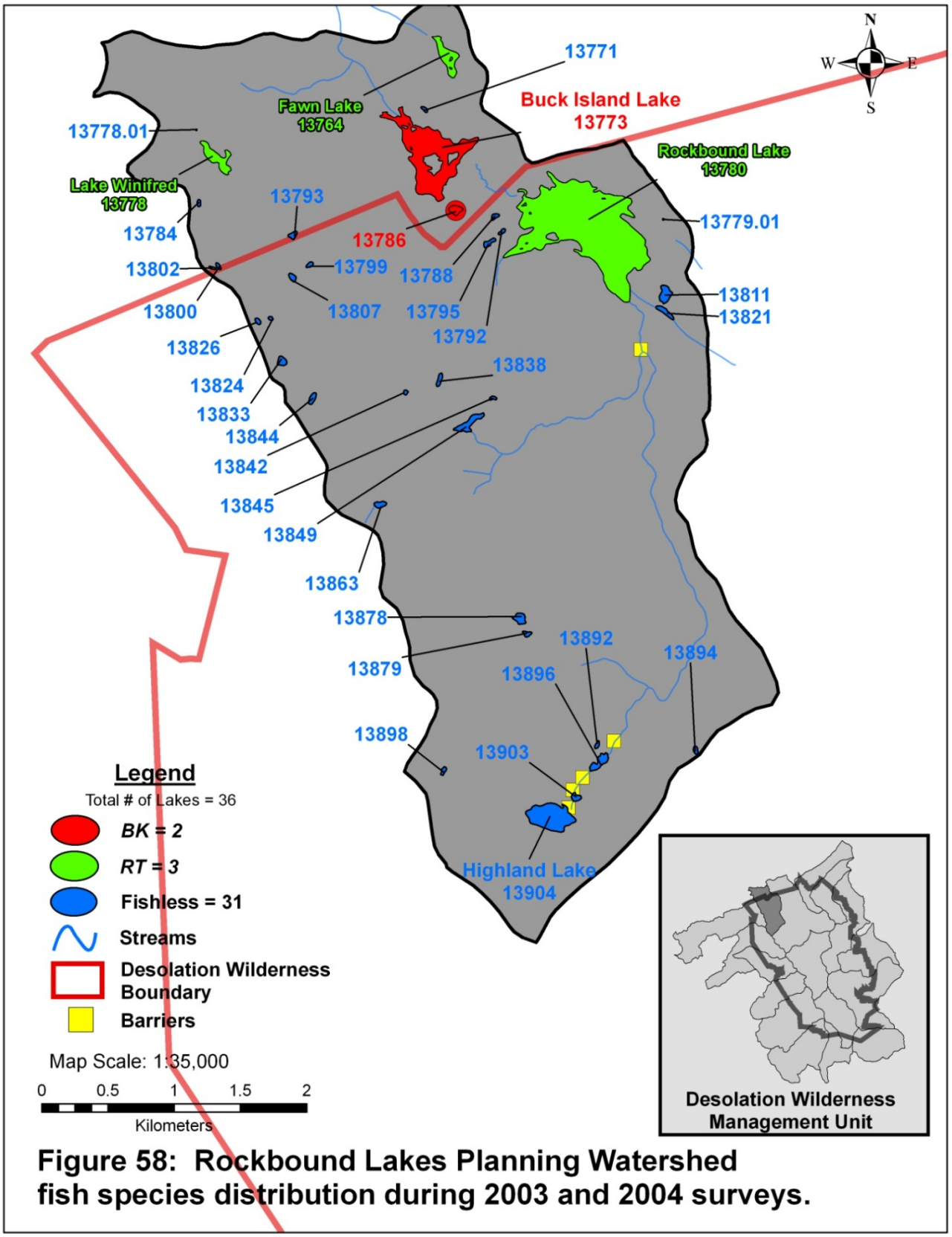

Figure 58: Rockbound Lakes Planning Watershed fish species distribution during 2003 and 2004 surveys.

16) ROCKY CANYON PLANNING WATERSHED MANAGEMENT DIRECTION

Rocky Canyon PWS drains the southern flank of Pyramid Peak via a high gradient, ephemeral creek that flows directly into the South Fork American River. There is a single unnamed water body within the PWS and no named lakes. The watershed does receive occasional visitation along an unmarked trail that ascends the southern shoulder of Pyramid Peak.

Table 46 provides summary data for amphibian resources and management in the Rocky Canyon PWS. Table 47 provides a summary of fish population data for the Rocky Canyon PWS. Table 48 provides a summary of fisheries management for the Rocky Canyon PWS. Figure 59 provides herpetofauna species distribution for the Rocky Canyon PWS. Figure 60 provides the management direction for the Rocky Canyon PWS. Figure 61 provides fish species distribution for the Rocky Canyon PWS.

Herpetofauna Resources and Management

No SNYLF or other special status species have been found in Rocky Canyon PWS. Lake ID 14358 is a fishless pond and will be managed for native aquatic species.

Fisheries Resources and Management

There are no fish-bearing water bodies within the Rocky Canyon PWS.

Table 46. Summary of herpetofauna survey data and management for Rocky Canyon PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
	14358.00	27-Aug-03	HYRE	0	0	20	100	0	Amphibian resource

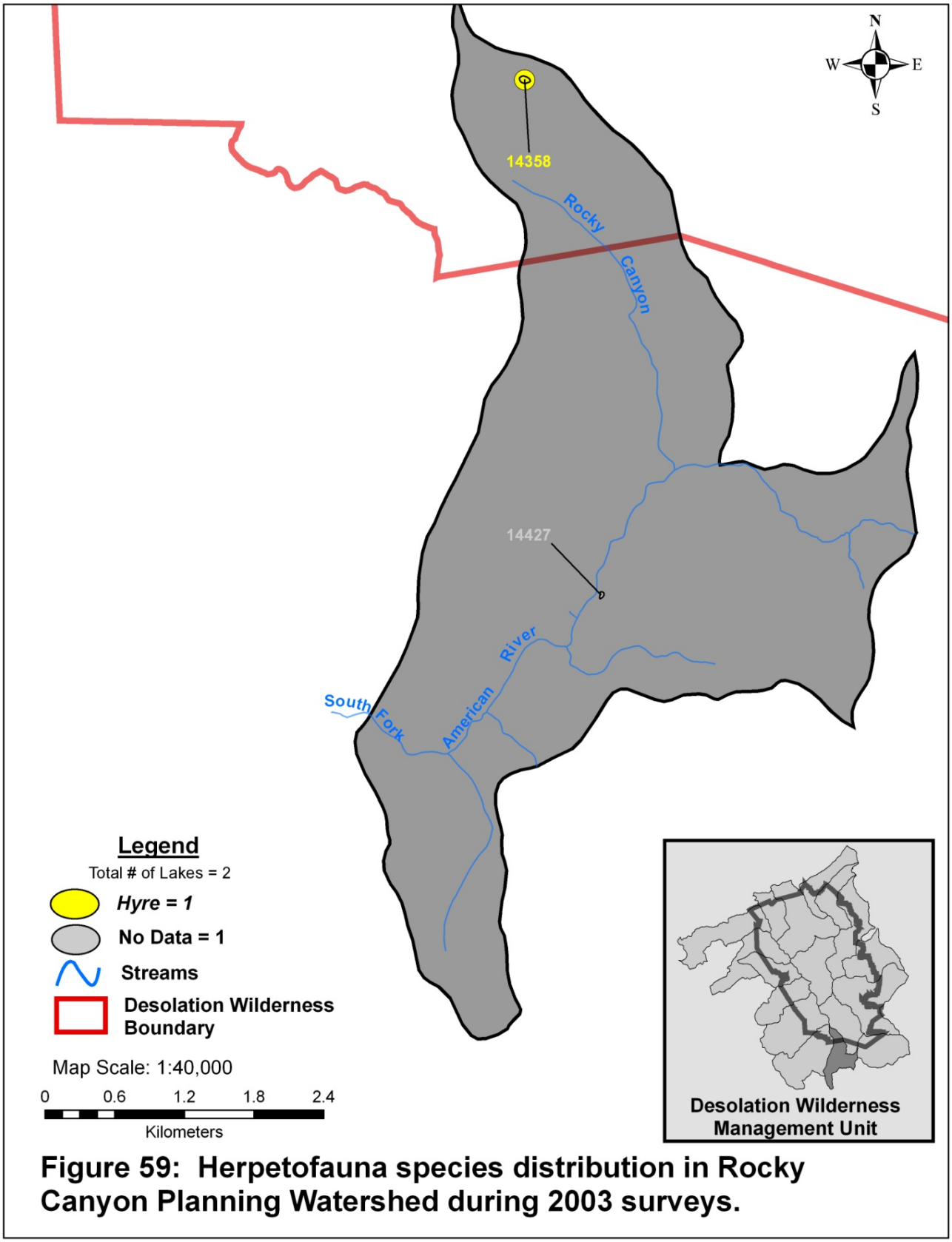

Figure 59: Herpetofauna species distribution in Rocky Canyon Planning Watershed during 2003 surveys.

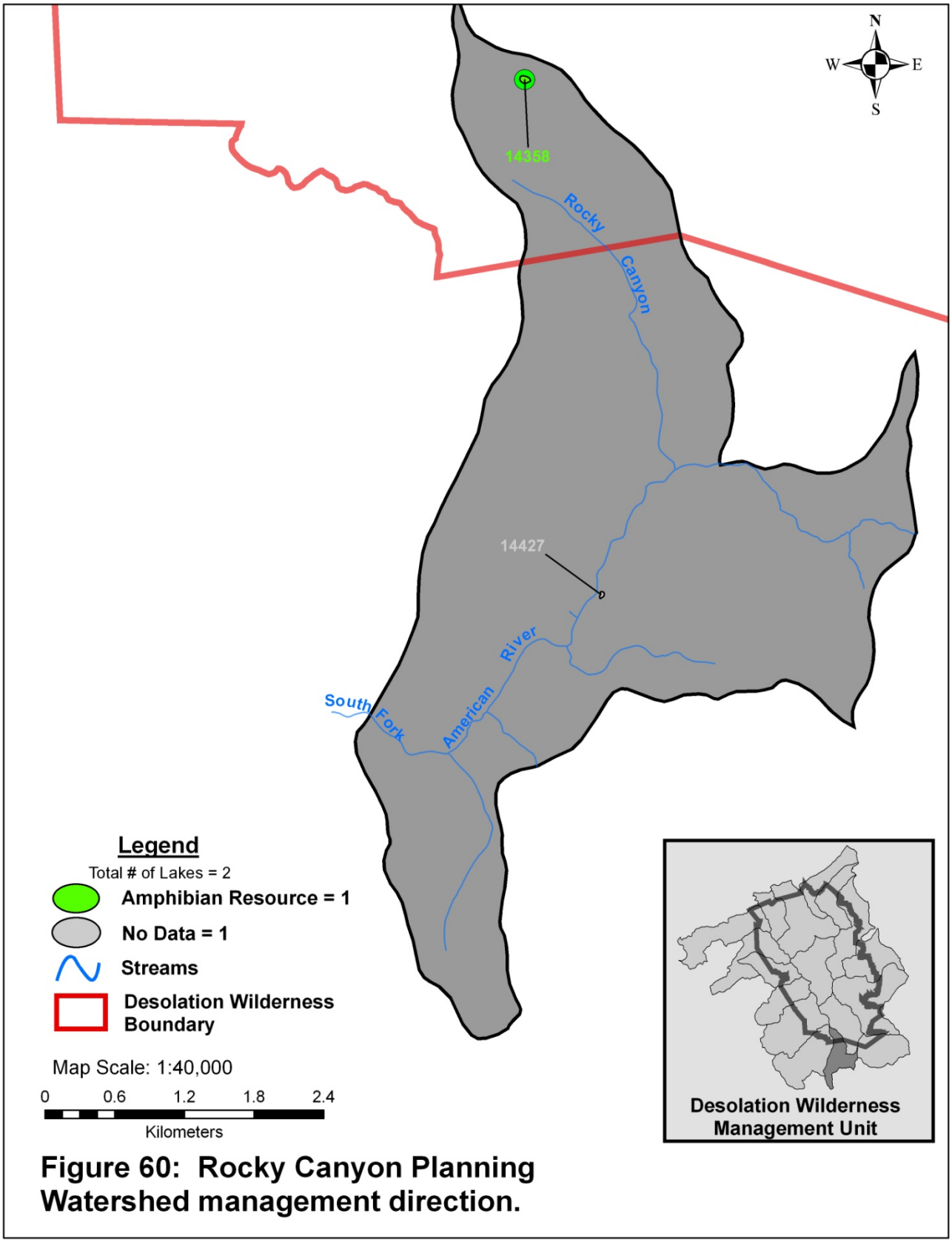

Figure 60: Rocky Canyon Planning Watershed management direction.

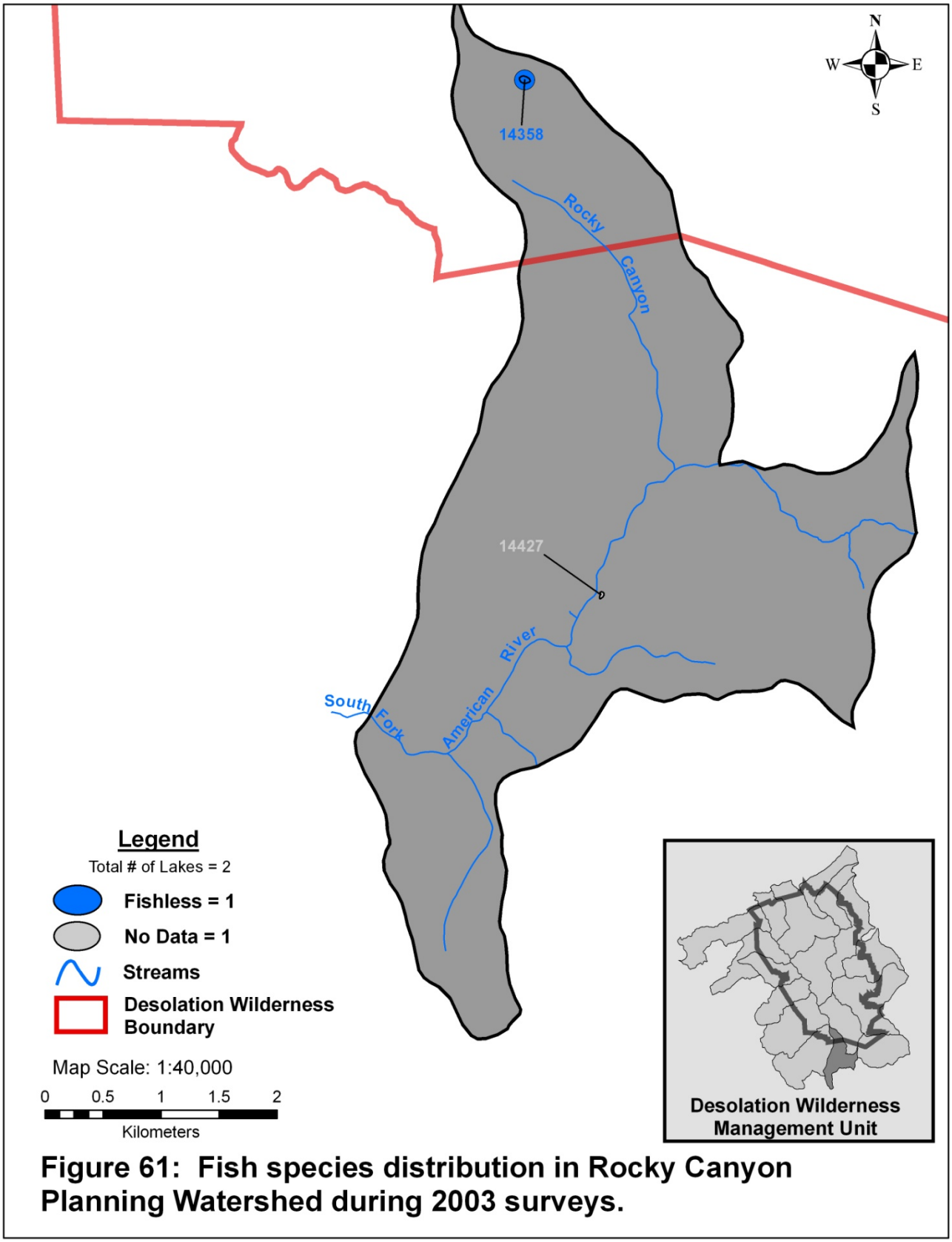

Figure 61: Fish species distribution in Rocky Canyon Planning Watershed during 2003 surveys.

17) UPPER SOUTH FORK RUBICON RIVER PLANNING WATERSHED MANAGEMENT DIRECTION

Upper South Fork Rubicon River PWS forms the headwaters of the South Fork Rubicon River which is part of the greater Middle Fork American River watershed. It is accessed via the Shadow Lake and Loon Lake trails starting from Van Vleck Bunkhouse. There are two named lakes and 19 unnamed water bodies within the watershed. The area receives little visitation since there is only one destination lake.

Table 49 provides summary data for amphibian resources and management in the Upper South Fork Rubicon River PWS. Table 50 provides a summary of fish population data for the Upper South Fork Rubicon River PWS. Table 51 provides a summary of fisheries management for the Upper South Fork Rubicon River PWS. Figure 62 provides herpetofauna species distribution for the Upper South Fork Rubicon River PWS. Figure 63 provides the management direction for the Upper South Fork Rubicon River PWS. Figure 64 provides fish species distribution for the Upper South Fork Rubicon River PWS.

Herpetofauna Resources and Management

SNYLF were not detected within the Upper South Fork Rubicon River PWS, nor does CDFG have any record of historic detections. Larval AMMA were found at Lake ID 13841 and Lake ID 13855. In addition, BUBO adults were observed at Lake ID 13818 and Lake ID 13847. All four of these small ponds will be managed as amphibian breeding resources.

Fisheries Resources and Management

Shadow Lake was initially stocked with brook trout in 1951. It was switched to rainbow trout stocking in 1977 and continued until 2000. A gill net survey conducted in 2004 returned several large rainbow trout and no brook trout. Other species were found during previous CDFG surveys in 1971 and 1997, specifically brown trout and Lahontan redsides. It is unknown if these species persist or if the 2004 data accurately represent the current fishery. More data collection is necessary to determine the long term management of this lake. The lake will continue to be stocked with rainbow trout until additional surveys warrant different management.

Huth Lake was stocked with brook trout for two years in 1962 and 1964. Gill net samples in 2004 show that brook trout persist and reproduce naturally. Lahontan cutthroat trout were stocked from 1969 to 1981 however they seem to have disappeared without active stocking. The fish population seems to be stunted without adding additional fish therefore the lake will continue to be managed as a self-sustaining brook trout fishery.

Table 47. Summary of herpetofauna survey data and management for Upper South Fork Rubicon River PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Herpetofauna Present	Adult	Sub-adult	Meta-morph	Larvae	Egg Masses	Management Direction
Shadow Lake	13877.00	15-Aug-04	None						Stocked lake
	13809.00	16-Aug-04	HYRE	1	0	5	18	0	Amphibian resource
	13818.00	17-Aug-04	HYRE	0	0	0	1	0	Amphibian resource
			BUBO	0	1	0	0	0	
			THCO	0	1	0	0	0	
	13825.00	15-Aug-04	HYRE	0	0	2	1	0	Amphibian resource
		4-Jun-03	TATO	4	0	0	0	0	
	13841.00	16-Aug-04	HYRE	2	0	36	14	0	Amphibian resource
			AMMA	0	0	0	7	0	
	13847.00	15-Aug-04	BUBO	1	0	0	0	0	Amphibian resource
			HYRE	1	0	3	0	1	
			THEL	0	1	0	0	0	
	13852.00	15-Aug-04	HYRE	4	0	0	0	0	Not actively managed
	13853.00	16-Aug-04	HYRE	0	0	0	0	23	Amphibian resource
			THSI	2	0	0	0	0	
	13855.00	16-Aug-04	HYRE	0	0	11	31	0	Amphibian resource
			AMMA	0	0	0	28	0	
	13874.00	15-Aug-04	HYRE	25	0	0	0	0	Not actively managed
	13901.00	4-Jun-03	THCO	0	4	0	0	0	Not actively managed
			THEL	0	1	0	0	0	
	13917.00	2-Sep-02	HYRE	11	0	0	0	0	Not actively managed
	13983.00	2-Sep-02	HYRE	2	0	0	0	0	Not actively managed
			THEL	2	0	0	0	0	

Table 48. Summary of fish population data for Upper South Fork Rubicon River PWS.

Lake Name	Lake ID	Survey Date	Survey Data: Fish Species Present	Self-sustaining	#Caught	Avg. Length (mm)	Avg. Weight (g)	Avg. K Value
Huth Lake	13887.00	14-Aug-04	BK	yes	20	202	75	0.893
Shadow Lake	13877.00	15-Aug-04	RT	no	4	339	354	0.914

Table 49. Summary of fisheries management information for Upper South Fork Rubicon River PWS.

Lake Name	Lake ID	First Recorded Stocking	Last Recorded Stocking	Pre-Survey Allotments	Current Proposed Allotment	Management Direction
Huth Lake	13887.00	1962 - BK 1968 - CT-L	1964 - BK 1981 - CT-L	DNP	DNP	Self-sustaining fishery
Shadow Lake	13877.00	1951 - BK 1969 - RT	1976 - BK 2000 - RT	1000 RT ANN	500 RT ANN	Stocked lake

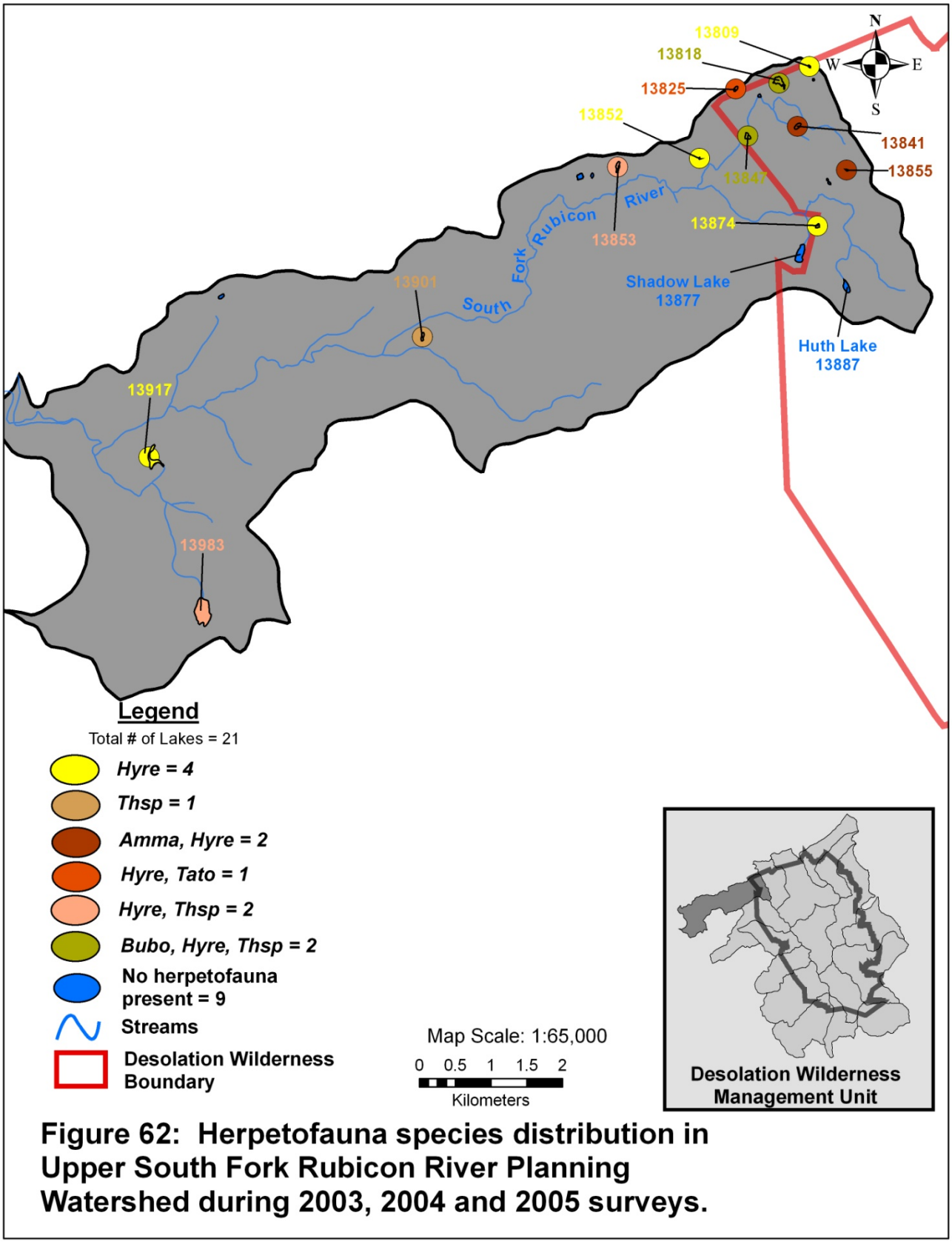

Figure 62: Herpetofauna species distribution in Upper South Fork Rubicon River Planning Watershed during 2003, 2004 and 2005 surveys.

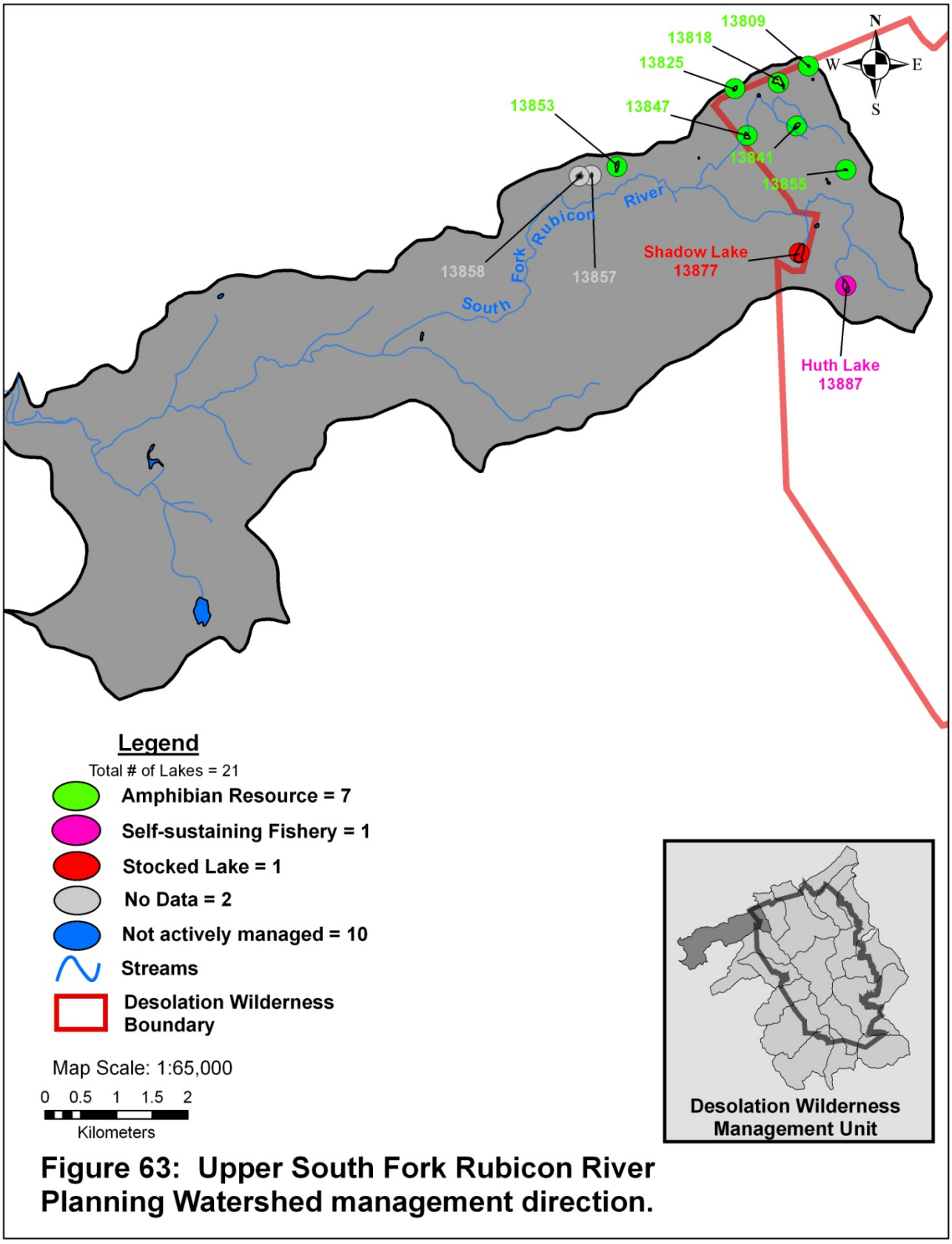

Figure 63: Upper South Fork Rubicon River Planning Watershed management direction.

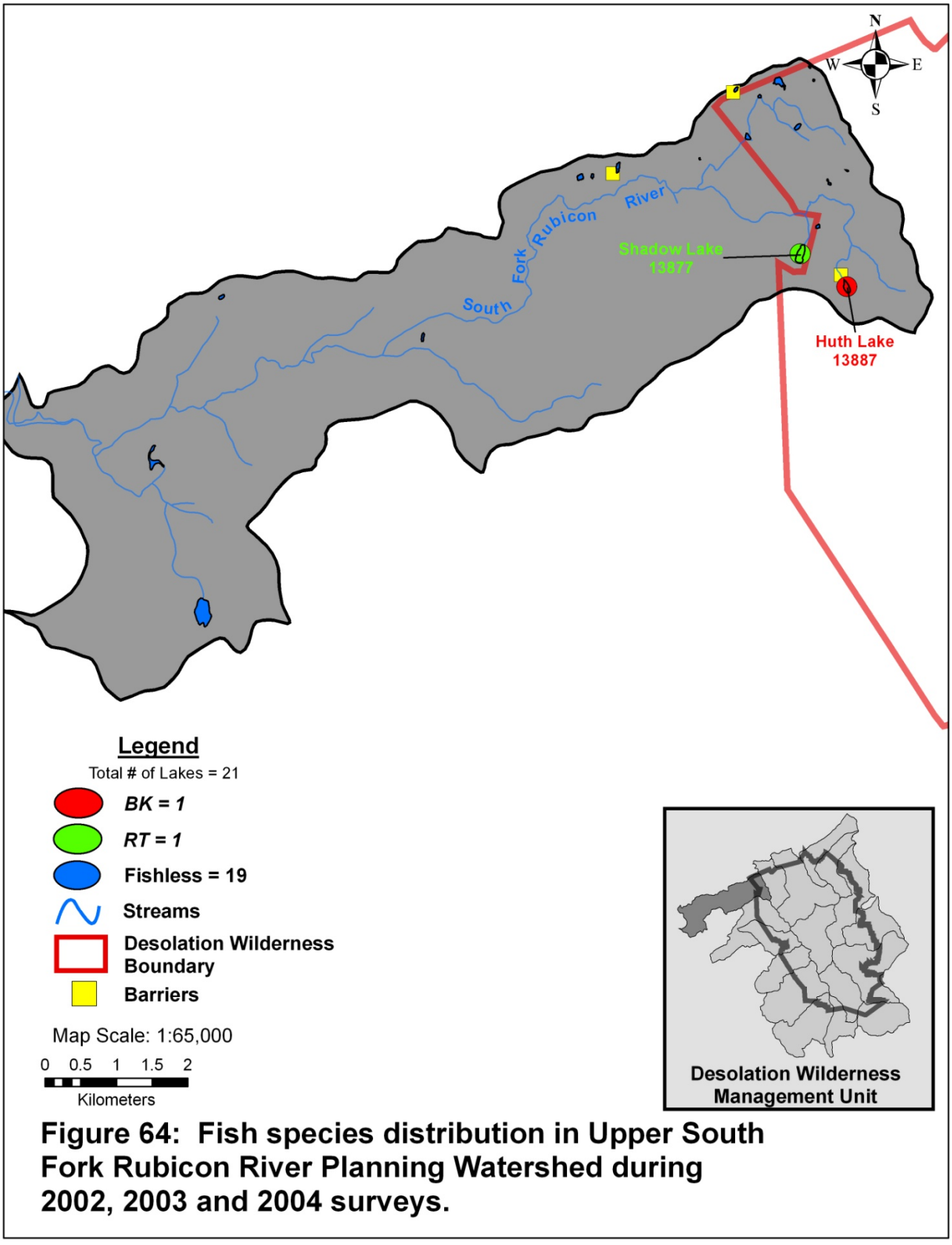

Figure 64: Fish species distribution in Upper South Fork Rubicon River Planning Watershed during 2002, 2003 and 2004 surveys.

SECTION IV

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