DESOLATION BULDERNESS and the SOUTH LAKE TAHOE BASIN

5th Edition

> A Guide to LAKE TAHOE'S FINEST HIKING AREA

Jeffrey P. Schaffer





Edition

Where else can you find 130 lakes, about 90 of them named, packed into 100 square miles of mountain scenery? Although Desolation Wilderness occupies only one-third of the area covered by this guidebook's map, it accounts for five-sixths of its lakes.

The trail makes a brief, steep climb, then winds south to where ducks mark a 200-yard traverse west to a lodgepole-shaded camp perched on a bench above the Rubicon. By it, the river cascades into a 10-foot-deep pool—brisk, but excellent for diving, cooling off, or just frolicking.

(Loon Lake Trail)



The several meadows along this trail will reward wildflower lovers, while at least three sets of creek pools will please others. However, the main attractions are the two subalpine lakes, which by early August can be suitable for swimming.

(Lyons Creek Trail)



Jeffrey P. Schaffer



Desolation Wilderness and the South Lake Tahoe Basin

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Front cover photo: The Pacific Crest Trail/Tahoe Rim Trail at the north end of Lake Aloha, south of the junction with the trail to Mosquito Pass. Photo by Daniel Deemer.

Back cover photo: The peaks of the Crystal Range (from left to right: Pyramid, Agassiz, and Price) soar above Lake Aloha in the early-morning twilight. Photo by Chad Brown.

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Read This

HIKING IN THE BACKCOUNTRY entails unavoidable risk that every hiker assumes and must be aware of and respect. The fact that a trail is described in this book is not a guarantee that it will be safe for you. Trails vary greatly in difficulty and in the degree of conditioning and agility one needs to enjoy them safely. On some hikes, routes may have changed or conditions may have deteriorated since the descriptions were written. Also, trail conditions can change even from day to day, owing to weather and other factors. A trail that is safe on a dry day or for a highly conditioned, agile, properly equipped hiker may be completely unsafe for someone else or unsafe under adverse weather conditions. You can minimize your risks on the trail by being knowledgeable, prepared, and alert. There is not space in this book for a general treatise on safety in the mountains, but there are a number of good books and public courses on the subject, and you should take advantage of them to increase your knowledge. Just as important, you should always be aware of your own limitations and of conditions existing when and where you are hiking. If conditions are dangerous, or if you are not prepared to deal with them safely, choose a different hike. It's better to have wasted a drive than to be the subject of a mountain rescue. These warnings are not intended to scare you off the trails. Millions of people have safe and enjoyable hikes every year. However, one element of the beauty, freedom, and excitement of the wilderness is the presence of risks that do not confront us at home. When you hike, you assume those risks. They can be met safely, but only if you exercise your own independent judgment and common sense.

Desolation Wilderness and Vicinity



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DEDICATION

For my wife, Bonnie, and my daughter, Mary Anne



PREFACE

MOST OF THIS BOOK'S HIKES were taken from a section of *The Tahoe Sierra* (1975 edition) that was titled "Trails of the Highway 50 Region." I hiked and mapped the trails in that section in 1974, accompanied and aided on many days by Kenneth Ng. In 1976, 1978, and 1979, I rehiked some of those trails, plus other Tahoe trails not found in that book. With this new information I compiled *Desolation Wilderness*, which was read in manuscript form by Nathan Leising of the Lake Tahoe Basin Management Unit of the U.S. Forest Service. After that, I did trail scouting every couple of years, the last year being 1995. The natural-history chapter has evolved with time, especially the geology subchapter. Over the years I came to realize that there were problems with the standard interpretations. In my lengthy PhD dissertation (third draft, 1995—later much abridged), I was able to demonstrate that virtually everything written about uplift and glaciation of the range was incorrect. The biology subchapter has changed much less.

Editors' note: Although this guidebook has been in print for several years, it continues to offer the best wilderness trail descriptions available. They are still accurate, to a large extent, as verified by U.S. Forest Service Desolation Wilderness staff. There could be minor reroutes on some trails, but they will be signed/posted. We have updated the text to reflect permit and campground information available as of 2020.



Overlooking Fallen Leaf Lake (see Hike 18)

CHAPTER 1

The Country

ne of California's most popular hiking areas, dominated by Desolation Wilderness, stands above the southwest shore of giant, mountain-rimmed Lake Tahoe. To the north a smaller hiking area, dominated by Granite Chief Wilderness, siphons some visitors to the subalpine country west of Tahoe's northwest shore, but this loss hardly makes a dent in the summertime "urban population" found in Desolation Wilderness. By the late 1970s this wilderness had grown so much in popularity that the U.S. Forest Service began to limit the number of backpackers entering it. Flying over the majestic Lake Tahoe Basin, you would expect most of the lands below you to be laced with scenic, public hiking trails. This, unfortunately, is not true, for the mountains north, south, and east above Lake Tahoe are, like most of the lake's shoreline, in private hands. Hence the brunt of the hiking use congregates in Desolation Wilderness and the adjacent mountain lands above the south shore of Lake Tahoe. Most of these lands are shown on the USGS Fallen Leaf Lake 15-minute topographic map, and this map, in updated form, can be found on pages 150-163. Trails, however, don't stop at the map's edge; rather they continue out to their trailheads. Hence the author has added some sections to this primary map in order to show all of this book's described trails in their entirety. These trails have been consolidated into 32 hikes found in four areas: Desolation Wilderness, Emerald Bay, South Fork American River, and Upper Truckee River.

THIS BOOK'S STAR ATTRACTION is compact Desolation Wilderness, which is certainly northern California's most accessible wilderness. It's about a 3-hour drive from the San Francisco Bay Area, a 2-hour drive from Sacramento, and a few minutes' drive from South Lake Tahoe. This 100-square-mile roadless area stands as an island of primitive solitude hemmed in on all sides by civilization's demands. Logging and grazing occur close to its western and northern borders, while widespread development west and south of South Lake Tahoe causes the exclusion of Cascade, Fallen Leaf, and Echo Lakes. To the south, US 50 and its developments prevent union with southern mountain lands. Averaging 12.5 miles long by 8 miles wide, this wilderness can be traversed in any direction by a strong hiker in a day or less. Because it is so compact and readily accessible, it is too crowded to be considered a wilderness in the strict sense of the word. Although wilderness areas should be pristine havens for solitude, don't expect to find any unless you get off the beaten path, which requires mountain skills. And pristine it's not: dozens of lakes have low dams, through the 1900s several hundred cattle invaded the west side in late summer, and today some visitors still leave traces of their presence (latrines would be most welcome at popular sites). Although the number of backpackers is limited to 700 per day, day hikers are unlimited. Both groups need wilderness permits (although the day-use permit requirement was suspended at press time due to COVID-19), and those caught without them may be cited (see page 11). With all these visitors treading the trails and splashing or fishing in the lakes, Desolation Wilderness is neither desolate nor wild; rather, it's best viewed as a mountain playland, an extension of the Lake Tahoe recreation scene.

And what attracts hikers to this readily accessible, triple-crested wilderness? Its Crystal Range, the prominent granite crest you see when driving east up US 50, averages only 9,500 feet in elevation, and the two crests east of it are even lower—hardly a match for central California's High Sierra. But where else can you find 130 lakes, about 90 of them named, packed into 100 square miles of mountain scenery? Although Desolation Wilderness occupies only one-third of the area covered by this guidebook's maps, it accounts for five-sixths of its lakes.

Like Yosemite National Park, Desolation Wilderness averages about 8,000 feet in elevation, and this general figure seems to be ideal for lake formation. Indeed, the bulk of the Desolation Wilderness lakes lie between 7,500 and 8,300 feet, and with mountain crests averaging 9,000 feet, there is sufficient relief to wrap the lakes in dramatic backdrops. Most of the landscape, like that of the High Sierra, is composed of granitic rock, differing significantly from the Sierra Crest north and south of the wilderness, which is mostly composed of thick volcanic deposits. This granitic rock fractures into an array of patterns, resulting in myriad shapes of lakes, which occupy bedrock basins excavated by glaciers. Furthermore, about 15% of the landscape is metamorphic, and this belt of rock, cutting east–west across the middle of the wilderness, paints the landscape in multihued earth tones, which are magnified when reflected in the still waters of, say, Gilmore and Lois Lakes.

In short, Desolation Wilderness is a mountain landscape that incorporates in a very small area most of the best features found in the High Sierra. It is prime lake country, ranging from 6,140 to 9,983 feet in elevation. It is high enough to avoid the oppressive summer heat found to the west, yet low enough for the hiker to get by with light clothing (though extra clothes and emergency gear should always be taken). Its mountains rise high enough to make them a strong attraction yet low enough to provide relatively easy accessibility through the countryside.

The trails of Desolation Wilderness are described in Hikes 1–20 and 23. The hikes are arranged in a counterclockwise arc, starting at Loon Lake, near the wilderness's northwest corner, and circling around to General Creek Campground (the starting point of Hike 24), near its northeast corner. Hikes 21, 22, and 24, along this arc, lie just east of the wilderness. Hikes 3 and 12 are also outside the wilderness, though each can be linked with a trail leading into it.

Several trails are omitted. At the west edge of topographic maps 1 (page 150) and 3 (page 154) below McConnell Peak are trails to Shadow Lake, outside the wilderness, and Forni Lake, within it. From the latter, a primitive trail climbs east to the saddle west of Highland Lake. This is a quick, though potentially dangerous, way to that lake and is for accomplished mountaineers only. The primitive trail climbs north to nearby Tells Peak, a worthy goal, but then it makes a lengthy, near-crest, sometimes cryptic descent to the Rubicon Trail. Finally, from a trail's end above Cascade Lake, on the east side of the wilderness, a fairly popular, though potentially dangerous, mountaineers' route climbs to Snow and Azure Lakes.

The best period to visit is about August 5–20, when lakes are usually at their maximum temperatures and the days are warm. Before late June, only Hike 1 is sufficiently snow-free for enjoyable hiking. By early to mid-July, however, most of the trails are hikeable and the passes are open, while the lakes, depending on their elevation and surrounding topography, are beginning to warm. Except for the low Hike 1 terrain, mosquitoes are an extreme nuisance almost everywhere through late July, so bring a tent and an effective repellent. August, being the most pleasant month, is the most crowded one, and wilderness quotas for overnighters can fill rapidly. After mid-September, use decreases quickly and, except for an occasional, usually mild storm, the days are quite pleasant, even though the nights can be freezing. During weekdays, in particular, you may be alone in watching autumn paint the deciduous vegetation in warm hues. However, hunters can abound in late September and early October—that is, during deer season. About mid-October the days become too cool for most hikers, and about then or soon after, a major storm dumps sufficient snow to keep trails buried until the next June.

EMERALD BAY

A NATIONAL SCENIC TREASURE such as Lake Tahoe should be totally accessible to the public. Unfortunately, most of its shore is privately owned, thereby causing the public to crowd the lake's relatively few public beaches. Lester Beach, in D. L. Bliss State Park, is one such beach. However, most of this park's shoreline is seldom visited, and for the bather seeking relative solitude, Hike 22, from the Lester Beach area south to Emerald Bay, offers shoreline access at a number of points. Hike 21 drops to Emerald Bay State Park's Vikingsholm Beach, Tahoe's only substantial public beach to which one must hike. On summer weekends its popularity is limited only by available parking

space. Because you can reach Vikingsholm Beach in a 15-minute walk, it is a good place to refresh yourself after a strenuous Desolation Wilderness hike. Of course, Lake Tahoe's public beaches require even less effort. Both Emerald Bay and Lake Tahoe are chilly by most people's standards. At best they warm to the mid-60s by August through mid-September, and to the low 60s or lower before then.

SOUTH FORK AMERICAN RIVER

THE TERRAIN JUST SOUTH of US 50 resembles Desolation Wilderness in that it is mostly granite and has been somewhat glaciated. But one glance at map 7 (page 162) tells you this area is quite different—it is almost lakeless. Although past glaciers filled every canyon from the Upper Truckee River canyon west to the Strawberry Creek canyon, sizable lakes developed in only two unlikely locations. Lake Audrain, near Echo Summit, lies in a shallow trough that was slightly eroded by an overflowing lobe of the giant Upper Truckee River glacier. Near the middle of the south base of the map is Cody Lake, which lies on a granitic bench halfway up a Cody Creek side canyon. Both lakes lack good trails to them.

Only four trails, combined into three hikes, are described in this section of the book. Hike 25 guides you to Lovers Leap in under an hour. From this summit you can



Emerald Bay's Vikingsholm Beach and Fannette Island

carefully look down its steep northwest face, which provides some of the best and most challenging climbing routes found in the entire Lake Tahoe area. Nonclimbers will appreciate the splendid views up- and downcanyon, which include a head-on view of the prominent lateral moraines lining the sides of Pyramid Creek canyon. This Lovers Leap Trail is usually hikeable from early June through mid-October. Hike 26, the Sayles Canyon and Bryan Meadow Trails, offers neither lakes nor views, just pleasant forest punctuated by two mountain meadows. Lacking Desolation Wilderness attractions, this hike also lacks its crowds. Only nature lovers need apply. Technically, Hike 27, a stretch of the Pacific Crest Trail, lies in the Upper Truckee River drainage but is included here because it crosses similar terrain. Both 26 and 27 are usually open from early July through mid-October, mid- to late July being best for flowers, and August being best for ideal temperatures and minimal mosquitoes.

UPPER TRUCKEE RIVER

TODAY'S UPPER TRUCKEE RIVER did not cut the mammoth canyon it now occupies. Late in the days of the dinosaurs, a fault formed and the canyon originated along it, deepening and widening over millions of years. More recently, glaciers flowed through it, but they did little more than create shallow basins now filled with lakes. Hikes 29–32 provide routes to the four largest lakes, Hikes 31–32 being particularly scenic. All the basin's lakes are at least partly rimmed with granitic bedrock, and in that



Upper Truckee canyon

6 DESOLATION WILDERNESS

respect they resemble the lakes of Desolation Wilderness. However, in each of these lake hikes you tread on some volcanic soil, and, with volcanic rocks lining the basin's walls, your impressions of this scenery will differ from those of any Desolation Wilderness hike. Hike 28, along an abandoned, lakeless historic road, will perhaps appeal only to history buffs and those in search of exercise. Still, it can be used to complete a loop trip to all four lakes. Take Hike 29 to Dardanelles Lake, visit Round, Meiss, and Showers Lakes (Hikes 30–31), and then trek north on the Pacific Crest Trail (Hike 27 in reverse), taking the alternate route to near the top end of Hike 28. This you descend in reverse toward the original trailhead, which, if you're willing to ford the Upper Truckee River, is only 100 yards from Hike 28's trailhead. Otherwise, add 0.5 mile along roads. Subalpine Showers Lake, due to its high elevation, may be partly snow-lined until early August and never warms for comfortable swimming. The other lakes are worth visiting from July through September.

Hiking in the Tahoe Area

Before delving into this guidebook's 32 hikes, you might first read this chapter, which covers information you should know for a safe, enjoyable, and informative excursion. If you're too eager to head up to Desolation Wilderness and can't take the time to read the whole chapter, at least read the sections on wilderness permits (page 11) and on minimal-impact hiking (page 16). Doing so will save you a lot of time and frustration, and you'll avoid possibly getting cited for entering the wilderness without a permit.

THIS GUIDEBOOK'S 32 HIKES

Hike Organization

The trails shown in this book's seven topographic maps (starting on page 149) are consolidated into and described in 32 hikes. These hikes fall into two broad divisions: If you were to drive counterclockwise around the perimeter of Desolation Wilderness, north of US 50, you would encounter Hikes 1–24 in the order they appear in this book. If you were to drive clockwise around the mountain lands south of US 50, you would encounter Hikes 25–32 in their proper order. (See overview map, page vi.)

On the counterclockwise loop, Hikes 1–7 cover trails along the western section of Desolation Wilderness, while Hikes 8–11 start near the wilderness's south edge. Hikes 8 and 9 describe features near Lake Aloha, while Hikes 10 and 11 describe features seen as you hike north through the middle of the wilderness. Hikes 12–20 cover trails around the southeast part of the wilderness, while 23–24 cover those in or near its northeast part. Hikes 21 and 22 cover trails of Emerald Bay, which lies just east of the wilderness.

On the clockwise loop, Hikes 25–27 cover trails south of US 50, from Lovers Leap east to Echo Summit. Hikes 28–30 start from Upper Truckee Road (and CA 89), while Hikes 31 and 32 start on or near CA 88. Hikes 27–32 lead into the Upper Truckee River basin.

Hike Description

For each hike, directions are given to its trailhead, and mileages are given to its main destinations. These destinations, usually lakes, are listed because many visitors will walk only partway along a hike, and they will want to know the mileage of their planned excursion. For example, not many people will follow 13.8-mile Hike 1 to its end just past Camper Flat; rather, most will proceed no farther than Rubicon Reservoir, 8.3 miles from the trailhead. The hike description naturally gives all appropriate trail directions, but it does more than that. It also mentions, and sometimes elaborates on, the natural features seen along the trail. Photographs show many of these features and may help you decide which hike to take.

While this book emphasizes geographical features, which are the main draw to this area, it minimizes the biological features—fish and wildflowers in particular. Experience shows that whenever a guidebook states that a lake has excellent fishing, anglers will rush to it, rapidly downgrading its fishing status to poor. Anglers should also note that the practice of stocking Desolation Wilderness lakes with trout was suspended in the mid-2000s, and many of the lakes have had their fish populations eradicated to provide habitat for the Sierra Nevada yellow-legged frog, an endangered species.

Wildflowers, mentioned in chapter 3, are beautiful and are the prime attraction for a few hikers, but they are rarely mentioned in our trail descriptions because they are so ephemeral. Some bloom early, others late, and the kind and amount of flowers you'll see depend on what month you're there. Their numbers can also vary considerably from year to year. For maximum wildflower exposure, hike in July—which unfortunately is usually when mosquitoes are quite abundant. Both peak in early summer, taking advantage of the abundant snowmelt water.

Selecting a Hike

Chapter 1 introduces you to this area and its hikes, but more should be said. Except for Hikes 9, 25, 26, and 28, all visit one or more lakes. Hence, if lakes are what you have in mind, you have quite a selection from which to choose. The following table lists this area's major lakes in order of increasing distance from a trailhead. It lists the shortest distance to each lake, which isn't always the easiest route. Hike 8's 2.4-mile climb to Ropi Lake is certainly more strenuous and dangerous than Hike 10's 4.5-mile climb to it (7.0 miles without water taxi). Likewise, hikes of a given length can vary greatly in difficulty. While almost anyone can hike the 4.5 miles to Spider Lake with little effort, some people trying to hike the 4.5 miles to Upper Velma Lake may turn back in agonizing despair. In sum, the lake-distance table just gives you an overall, simplified view of this area's lakes; consult this book's topo maps and the appropriate hike (its introduction and description) for a better impression of the route that interests you. If you're in average shape you can day hike to all lakes under 5 miles except Dicks, Fontanillis, and Velma



Caples Lake

(all in Hike 20, which makes a very steep climb). However, many hikers, anglers in particular, prefer to backpack to any lake more than 1 mile from its trailhead.

Table of Shortest Distances to This Area's Lakes

Longer routes to these lakes are omitted. The number in parentheses refers to the hike that goes to that lake in the shortest distance. Hike 10 mileages assume you've taken the water taxi, which saves 2.5 miles. Hike 8 provides the shortest way in to Avalanche, Pitt, and Ropi Lakes, but it is too dangerous for many hikers; take Hike 10 instead.

Miles Lakes

- 0.5 Lower Angora Lake (12)
- 0.6 Beauty Lake (4)
- 0.8 Upper Angora Lake (12); Lake Tahoe, at Emerald Bay's Vikingsholm Beach (21)
- 1.0 Eagle Lake (20)
- 1.1 Granite Lake (19)
- 1.3 Tamarack Lake (10)
- 1.6 Ralston Lake (10), Cagwin Lake (10)
- 1.7 Triangle Lake (10), Floating Island Lake (18)
- 1.8 Bloodsucker Lake (3)
- 1.9 Avalanche Lake (8)

Miles Lakes

- 2.0 Pitt Lake (8)
- 2.1 Grouse Lake (5), Showers Lake (32)
- 2.5 Ropi Lake (8), Cathedral Lake (18)
- 2.6 Hemlock Lake (5), Lake Margery (10), Grass Lake (14)
- 2.7 Lower Twin Lake (5), Lake Lucille (10)
- 2.8 Lake of the Woods (10)
- 2.9 Meiss Lake (32)
- 3.0 Smith Lake (5)
- 3.1 Upper Twin Lake (5), Boomerang Lake (5), Round Lake (30)
- 3.3 Island Lake (5), Lake Aloha (10)

Miles	Lakes		Miles	Lakes
3.6	Richardson Lake (11)		5.9	Barrett Lake (4), Shadow Lake (23)
3.8	3.8 Gertrude Lake (6)		6.1	Buck Island Lake (1)
3.9	3.9 Tyler Lake(6)		6.2	Lake Doris (7)
4.0	Dardanelles Lake (30)		6.3	Lawrence Lake (4),
4.1	L Loon Lake, at its Pleasant Camp- ground (1); Susie Lake (15)			Stony Ridge Lake (23)
			6.7	Rockbound Lake (1), Lake No. 5 (4)
4.2	Lake LeConte (10),		6.8	Lake No. 9 (4), Clyde Lake (10)
			6.9	Top Lake (4)
4.3	Dicks Lake (20)		7.3	Lake No. 4 (4), Lake Lois (7),
4.4	Middle Velma Lake (20)			Duck Lake (24)
4.5	Spider Lake (1),		7.5	Lost Lake (24)
4.6	Maud Lake (7).		7.6	Lake No. 3 (4)
	Lake Genevieve (23)		8.1	Rubicon Lake (23)
4.7	Pearl Lake (4)		8.2	Fox Lake (1)
4.8	Half Moon Lake (16)		8.3	Rubicon Reservoir (1)
4.9	Lake Sylvia (2), Fontanillis Lake (20), Crag Lake (23)		8.6	Lake Schmidell (7)
			9.8	Lower Leland Lake (7)
5.0	Lyons Lake (2)		10.6	McConnell Lake (7)
5.2	Heather Lake (15)		11.8	Horseshoe Lake (7)
5.3	Lake Winifred(l)		12.0	4-Q Lakes (7)
5.5	Alta Morris Lake (16)		12.3	Lake Zitella (7)
5.7	Hidden Lake (23)		13.5	Highland Lake (7)

Hikes That Climb to Prominent Summits

These are Hike 9 (Ralston Peak, 4.6 miles), Hike 13 (Echo Peak, 3.6 miles), Hike 17 (Mount Tallac, 6.0 miles), Hike 18 (Mount Tallac, 4.6 miles), and Hike 25 (Lovers Leap, 1.4 miles). If you take the Echo Lakes water taxi, then Hike 10 provides the shortest route to Ralston and Echo Peaks, 4.3 and 2.6 miles respectively. All summits provide rewarding views, the one from Mount Tallac being, in my opinion, the best. Of course, you needn't climb to a mountaintop to get a superlative view; these exist along many trails covered by this guide. Mountaineers may want to go cross-country to climb trailless peaks, Pyramid Peak in particular (see Hike 2). And most rock climbers know that Tahoe's best climbing cliff is Lovers Leap (see Hike 25). Where other climbing opportunities exist, this guide identifies them.

Perhaps you have friends who've hiked in this area, and they can tell you their favorite trails and lakes. Some of the choicest spots are off the trail, and these I leave for your own discovery. Discovery is, after all, an important part of the wilderness experience. After you peruse this book's hikes, odds are you'll select a hike into Desolation Wilderness. To enter it, you'll need a wilderness permit.

WILDERNESS PERMITS

DURING THE 1960S, backpacking, with its new, lightweight technology, came of age, and hikers proliferated throughout the Sierra Nevada. By the time Desolation Wilderness was officially created in late 1969, it was already crowded. In 1971 the U.S. Forest Service began a permit system, in part to study visitor use and impact. The Forest Service determined that the wilderness's optimum capacity was about 2,100 persons at one time, which was considerably less than what could be found on a typical summer day. In 1978 the Forest Service began a quota system by which it limited the number of overnight users. *Wilderness permits are required for both overnight users and day users. If you enter the wilderness without a permit, you could be issued a violation notice by a patrolling ranger.* Note: At press time, the day-use permit requirement was temporarily suspended due to COVID-19 restrictions. Check the websites below for updates.

For the latest information, visit the Eldorado National Forest website, fs.usda.gov /eldorado, and follow the Special Places link to locate information about Desolation Wilderness. For the Lake Tahoe Basin Management Unit, visit fs.usda.gov/ltbmu, again following the Special Places link. Overnight Desolation Wilderness visitors only: The fee for wilderness permits is \$5 per person for the first night and \$10 per person for 2–14 nights. Children age 12 and under are free. There is also a \$6 reservation fee when booked at recreation.gov. Information regarding Desolation Wilderness is also available at the Desolation Wilderness Volunteers site, desowv.org.

When

Wilderness permits are necessary *every day* of the year, even in the dead of winter when no one may be present but you. For a true taste of the wilderness, *experienced* hikers should visit the area when it is snowbound, from about November through May. Then, the traces of man lie beneath the snow, and solitude reigns supreme.

How Many

The Forest Service dispenses permits for up to 700 overnight users per day. Up to 490 persons per day can reserve them, and knowledgeable users do just that. The quota system is in effect from the Friday before Memorial Day through September 30. For the rest of the year, usage is low enough that a quota system is unnecessary. Note: At press time, the number of day users was unrestricted and 100% of overnight permits were reservable, due to the COVID-19 situation, but because this policy may change, call one of the offices listed below to check on current requirements.

Where

You can reserve a wilderness permit within six months of the start of your proposed hike during the quota period by visiting recreation.gov. Or stop at the Desolation Wilderness Office at the Placerville Ranger District (see below), where the remainder of the daily permit allotment can be issued. If you plan to enter the wilderness anywhere west of the Sierra Crest (i.e., west of Echo Summit), stop at the **Placerville Ranger District** (4260 Eight Mile Road, Camino; 530-647-5415), located off US 50 in Camino at Exit 54. *Note:* This office is currently offering virtual services only, Monday–Friday, 8–4:30 p.m., excluding holidays. If you have a question or need assistance, please call 916-500-4712 and leave a message and the staff will respond at their earliest convenience.

For east-side entry, stop at the **Taylor Creek Visitor Center** (530-543-2674), just north of Camp Richardson. It is located on the right side of CA 89 about 3 miles northwest of the US 50/89 split in South Lake Tahoe. The center's entrance is just 150 yards past Fallen Leaf Road. *Note:* This office is currently not offering services. Before you visit, check whether it has reopened.

Alternatively, you could stop at the Lake Tahoe Basin Management Unit (35 College Drive, South Lake Tahoe; 530-543-2600). Note: At press time, this office was offering virtual services only, Monday–Friday, 8–4:30 p.m., excluding holidays. If you have a question or need assistance, please call 530-543-2600 and leave a message, or email pa_ltbmu@fs.fed.us, and the staff will respond at their earliest convenience.

Day users can obtain a wilderness permit (if the requirement has been reinstated) at one of the offices mentioned above or at their trailhead. Permits are available at the major trailheads. On busy days, popular trailheads can run out of permits, so you may have to drive to a nearby trailhead or visit one of the offices. If permits are not available at your trailhead and you enter the wilderness without one, you can be cited by a patrolling ranger.

CAMPGROUNDS

BECAUSE HIKERS OFTEN STAY at campgrounds either before or after their hikes, this guidebook lists campgrounds, grouping them by hike and listing them in the order you would encounter them. For example, those driving to the Hike 1 trailhead would encounter Sunset Campground first and Loon Lake Campground last.

Unless described as private, all campgrounds are administered by government agencies. During the summer, many of the campgrounds fill up, especially on weekends, so you should make reservations well in advance (ideally, two to four months). **Most of the public campgrounds are on a reservation system, and these are identified with an asterisk (*).** For U.S. Forest Service campground reservations, visit recreation.gov or call 877-444-6777 four days to six months in advance of your first night's stay; for state park campground reservations (Emerald Bay, D. L. Bliss, General Creek), visit reserve california.com or call 800-444-7275.

Public campgrounds generally cost \$25–\$45 per night for a single tent site. Several of the private campgrounds are in the same range, although a few are higher. Private campgrounds provide hot showers and other amenities; however, they tend to be noisy because they are next to a busy highway or, for Tahoe Valley Campground, because sporadic noise comes from aircraft flying overhead from nearby Lake Tahoe Airport. On the other hand, because public campgrounds lack electrical hookups, RVers often have annoying generators operating. Additionally, from the author's experience, rowdy campers frequent the cheaper (i.e., public) campgrounds. (Most private campgrounds are well patrolled and do not tolerate disturbance, while public ones tend to be underpatrolled or not patrolled at all).

Hike 1

*Sunset Campground, Wench Creek Group Campground, *Yellowjacket Campground: All three are larger campgrounds around Union Valley Reservoir, just west of Forest Route 3. *South Fork Group Campground: Just 0.1 mile past the Forest Route 1 junction, branch left, go 0.8 mile, and branch right 0.1 mile. *Loon Lake Campground: Near the Hike 1 trailhead.



Spider Lake

Hikes 2-7

*Wrights Lake Campground: By the trailheads for Hikes 3–7.

Hikes 8-11

Lovers Leap Campground: 1.3 miles west of the trailhead for Hike 8. The Lake Tahoe KOA, formerly used for hikes in this section, is closed.

Hikes 12-18

Tahoe Valley Campground (private; 530-541-2222): One block east of US 50, just 0.4 mile south of the US 50/CA 89 split in South Lake Tahoe. Camp Richardson (private; 530-541-1801; 800-544-1801): On CA 89 about 2.5 miles northwest of the US 50/CA 89 split in South Lake Tahoe and 0.5 mile before Fallen Leaf Road. *Fallen Leaf Campground: 0.5 mile west of Camp Richardson on Fallen Leaf Road.

Hikes 19-22

*Emerald Bay State Park (two camping areas): Northeast slopes above head of Emerald Bay. Bayview Campground (24-hour limit): Above Emerald Bay. *D. L. Bliss State Park (five camping areas): Along park road down to the Hike 22 trailhead.



Grouse

Hikes 23–24

*Meeks Bay Campground: Just 230 yards south of the Hike 23 trailhead. Meeks Bay Resort (private; 530-525-7242): Just 250 yards north of the Hike 23 trailhead. *General Creek Campground (Sugar Pine Point State Park): By the Hike 24 trailhead. *William Kent Campground: By William Kent Visitor Center, 2.2 miles south of Tahoe City.

Hikes 25-30

Undeveloped campsites (no fee) along road descending from the Big Meadow trailhead (Hike 30).

Hikes 31-32

*Caples Lake Campground: On CA 88 opposite Caples Lake Resort. Schneider Camping Area (primitive campground without water; no fee): 0.4 mile before the Hike 32 trailhead.

BACKPACKING AND DAY HIKING

General

Most of the hikes in this book can be done as day hikes rather than overnight hikes, although you may want to take more than one day to do many of them. Generally, however, each requires very little planning and preparation.

Because detailed, updated maps are included in this guide, mileage figures within the text are kept to a minimum. There are, however, numerous instances where vertical distance in feet and horizontal distance in yards are given. The vertical distance tells you how much you will have to climb, thereby informing those who like easy hikes what they're in for. The horizontal distance has a more practical purpose: Some trail junctions can be missed if poorly signed or if snow still covers the trail; therefore, potentially hard-to-find junctions are identified by their distance from the nearest identifiable feature—often a creek crossing. Yards are given because they approximately equal long strides—when in doubt, the hiker can pace off the distance.

Your progress along a trail is often measured with respect to a prominent feature in the landscape, such as a mountain or a hill above you. On this guide's topographic maps, many unnamed high points are identified by an *X*, which marks the point, and a number, which gives the elevation. This guide refers to these high points as peaks—for example, peak 9,224. Some trails in this guide are potentially hard to follow in a few spots. Others may have lingering snow patches that hide them. For both, your route can usually be found by watching for blazes or ducks that mark the trail. A *blaze* is a conspicuous, man-made scar on a tree trunk that results from the removal of a patch or two of bark. A *duck* is one or more small rocks placed on a larger rock in such a way that the placement is obviously unnatural.

Minimal-Impact Hiking

If thousands of hikers walk through a mountain landscape, with its fragile soils, they are almost bound to degrade it. The following suggestions are offered in the hope they will reduce human impact on the landscape, thus keeping it attractive for those who might follow.

First, if you're healthy enough to make an outdoor trip into a wilderness area, you're in good enough condition to do so on foot. Leave horses behind. (However, most hunters who enter Desolation Wilderness and other mountain areas in late September and early October will certainly object to carrying a deer out on their shoulders.) One horse may do more damage than a dozen backpackers. It will contribute at least as much excrement as all of them, but moreover, it will do so indiscriminately, sometimes in creeks or at lakeshores. Another problem with horses is that they can transform meadow trails into muddy ruts, particularly in early season. And they selectively graze the meadows, affecting certain native plants. For example, only 30 years after Yosemite Valley was set aside as a state park in 1864, its luxuriant native grasses and wildflowers were reduced to about one-fourth their original number, largely replaced by hardier, less showy alien species. Also affecting meadows, though probably to a lesser degree, are grazing animals, especially cattle. In comparison, the relatively few horses have made only a minor impact. Occasionally it's the riders rather than the horses that are a problem. It's so easy to pack in food for a feast and leave garbage, cans, and bottles littering the campsite. If you do bring stock animals into Desolation Wilderness, it is recommended that you take supplemental feed, and you're not allowed to tie or picket them in any meadow or within 200 feet of water.

If at all possible, day-hike rather than backpack. As was mentioned earlier, you can make easy to moderate day hikes to over half of the Desolation Wilderness lakes, and the same applies to the lakes outside the wilderness. Actually, if you're *really* in shape, there's no reason you can't day-hike to *any* lake under 10 miles away and *enjoy* it (and mountaineers, using cross-country shortcuts, can reach them all). Such a hike should take about 6 hours or less to walk, plus the time spent relaxing at spots. Anglers will object, since fishing is best around dawn and dusk, and who wants to get up at 3 a.m. to fish a lake at dawn? For them, backpacking is a must.

Why do day hikers have less impact on the environment? For one thing, they usually use toilets near trailheads rather than soil near lakes. Seven hundred backpackers in Desolation Wilderness contribute about a ton of excrement *per week*, and the bulk of this is within 100 yards of a lake, stream, or trail. Whereas horse and cattle excrement lying on the ground decomposes rapidly, buried human excrement takes longer. Excrement can lead to deterioration of a lake's water quality. Always defecate at least 200 feet away from any lake or stream, and the Forest Service recommends you bury feces 6–8 inches deep. *Environmentally conscious campers will carry out both toilet paper and feces, and then dispose of them properly after reaching the trailhead.*

If, in order to have a satisfactory wilderness experience, you decide to backpack, please consider the following advice, which is specifically aimed at those visiting Desolation Wilderness, but is applicable to all overnighters in the mountains.

- 1. **Pack out all trash, including toilet paper.** Popular lakes can receive over 1,000 visitors during a summer, and there is a limit to how much paper can be buried.
- 2. Don't build a campfire. They are prohibited in Desolation Wilderness. Downed wood is already too scarce, and cutting or defacing standing vegetation, whether living or dead, is prohibited. Instead use a stove, which cooks meals faster, leaves pots and pans cleaner, and saves downed wood for the soil's organisms, which are consumed by animals. Campfires can leave an unsightly mess, and, as the snowpack melts, campfire ashes can be carried into lakes, reducing water quality. If you are backpacking *outside* the wilderness, you'll need a *campfire permit* if you intend to build a fire. Get one at a Forest Service office (when they reopen) or online at readyfor wildfire.org/permits/campfire-permit. It is a good idea to carry a shovel. If you don't build any fires but use only a gas stove, then you can leave the shovel behind but will still need the permit.
- 3. Don't pollute lakes and streams by washing clothes or dishes in them or throwing fish entrails into them. And don't lather up in them, even with biodegradable soap. *All* soaps pollute. Do your washing and pot scrubbing well away from lakes and streams, and bury fish entrails ashore rather than throwing them back into the water.
- 4. Set up camp at least 100 feet from streams, trails, and lakeshores. At some lakes this may be practically impossible, and then you must be extremely careful not to degrade the environment. Always camp on mineral soil (or perhaps even on bedrock, if you've brought sufficient padding) but never in meadows or other soft, vegetated areas. It's best to use an existing site rather than to brush out a new one, which would result in one more human mark upon the landscape.
- 5. Leave your campsite clean. Don't leave scraps of food behind, for this attracts mice, bears, and other camp marauders. If you can carry it in, you can carry it out. After all, your pack is lighter on the way out.
- Don't build structures. Rock walls, large fireplaces, and bough beds were fine in John Muir's time, but not today. There are just too many humans on this planet, and one goes into the wilderness for a bit of solitude away from

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them. The hiker shouldn't have to be confronted with continual reminders of human presence. Leave the wilderness at least as pure as you found it.

- 7. **Noise and loud conversations,** like motor vehicles and mountain bikes, are prohibited. Have some consideration for other campers in the vicinity. Also, camp far enough away from others to ensure privacy for both them and you.
- 8. **Dogs are allowed in the wilderness,** but the Forest Service strongly recommends you leave them home. If you bring one, it must be kept leashed or under immediate control.

Regardless of whether you are day-hiking or backpacking, you should observe the following advice.

 The smaller your party, the better. In Desolation Wilderness overnight groups are limited to 12 persons, and groups of 8 or more should avoid the most popular trails. These trails are in Hikes 5–7, 10–11, 14–17, and 20. If you do have a large party, consider camping outside the wilderness. Lakes outside the wilderness that can handle large groups are Spider and Buck Island Lakes (Hike 1), Barrett Lake (Hike 4), Richardson Lake



Leopard lily

(Hike 11), Lost Lake (Hike 24), Round Lake (Hike 30), and Meiss Lake (Hike 30 or 32). Also try to avoid the main hiking season, which lasts from mid-July through Labor Day weekend, when lakes are warmest.

- 2. If you are 16 or older, you need a California fishing license to fish. The wilderness's limit is 5 trout per day, 10 in possession. You can also have up to 10 eastern brook trout—if they are 10 inches or shorter. You also need a license to hunt. Observe all regulations.
- 3. Destruction, injury, or disturbance to any natural feature or public property is prohibited. This includes disturbing any animal, picking flowers or other plants, and damaging growing trees or standing snags.
- 4. **Smoking is not allowed while traveling through vegetated areas.** You may stop and smoke in a safe place.
- 5. **Pack and saddle animals have the right-of-way on trails.** Hikers should get completely off the trail, on the downhill side if possible.
- 6. When traveling on a trail, stay on its tread. Don't cut switchbacks, as this destroys trails. When going cross-country, don't mark your route in any way. Let others find their own way.
- 7. Be prepared for sudden adverse weather. It's good to carry a poncho even on a sunny day hike. It can also double as a ground cloth or emergency tent. A space blanket (typically weighing just 3 ounces) is also useful. Some day hikes unintentionally turn into overnight trips due to injury, getting lost, or bad weather. Never climb to a summit if ominous clouds are building above it, particularly if you hear thunder in the cloudy distance. And if you see lightning, turn back.
- 8. As a rule, don't hike alone. The farther you are from your trailhead, the greater the problem if you are injured.

GIARDIASIS

MOUNTAIN WATERS SOMETIMES contain microscopic, disease-producing organisms. One is *Giardia lamblia*, whose cystic form can be found in clear mountain streams and lakes, even if they look, smell, and taste fine. Although the disease it causes, giardiasis, can be incapacitating, it is not usually life-threatening. Symptoms usually include diarrhea, gas, nausea, loss of appetite, abdominal cramps, and bloating. These discomforts may last up to six weeks. Symptoms do not begin immediately after ingesting giardia; they may develop after you have returned home. If properly diagnosed, the disease is curable with medication prescribed by a physician. The best method of treating water is to use a portable filter, available in many outdoors stores. The safest bet, however, is to day-hike and to carry your own supply of water.

Natural History of the Tahoe Area

GEOLOGY

Introduction

Measuring about 22 miles long from north to south and 12 miles wide, 191-squaremile Lake Tahoe is the country's largest mountain lake. Having a depth of 1,645 feet, it is surpassed only by 21-square-mile Crater Lake, with a depth of 1,932 feet. Crater Lake, discovered in 1853, went on to become a national park. Lake Tahoe, discovered in 1844, was almost destroyed by the rising tide of humanity. (Lake Tahoe, once as clear as Crater Lake, now has a maximum viewing depth of about 70 feet, versus more than 100 for Crater Lake.) Alas, the geologic processes responsible for creating the Lake Tahoe Basin also kept it from achieving national-park status, as we'll see. The principal piece of Tahoe land preserved for public use is Desolation Wilderness, which, like Yosemite National Park, happened to have the right geologic constituents: it was mostly granitic, it was deeply glaciated, and it lacked economically important minerals.

The geologic history presented below is very different from that of the first two editions, for I and others have done Sierran field work that negates much of what was believed as late as the 1980s. The new geology incorporates new interpretations on the origin and uplift of mountain ranges and on the role of glaciers in transforming their landscapes.

First Rocks

Tahoe's geological history is a youthful one by the earth's standards. When masses of magma rising through the earth's crust solidified to form the Sierra's first granites about

240 million years ago, the planet had already reached 95% of its present age. These granitic masses, known as plutons, formed not in Desolation Wilderness but rather in the southern Sierra Nevada near Walker Pass.

About 240 million years ago, the area comprising Desolation Wilderness lay just offshore from North America, the coastline located perhaps in the vicinity of Lake Tahoe. To the east, in western Nevada, was a line of volcanoes. These did not form a towering volcanic range such as the Andes, but rather developed close to sea level. Indeed, some of their flows reached the sea. Desolation Wilderness remained a very shallow part of that sea, lying under perhaps less than 50 feet of water until volcanism waned about 220 million years ago. By then the coastline had retreated at least 50 miles east of the vicinity of Lake Tahoe. About the same time, the limestone comprising the shallow sea floor of Desolation Wilderness was part of a crustal mass that began to sink between faults, transforming it rather quickly, geologically speaking, into a deep-sea floor.

For about 40 million years that environment collected sediments. These make up the Sailor Canyon formation and are preserved as the lower third of Desolation Wilderness's Mount Tallac roof pendant (a remnant of older rocks atop granitic bedrock). Today this 5,000-foot-thick band of sediments occurs mostly along the floor and lower slopes of Rubicon Valley from near the junction of the Schmidell and Rubicon River trails upcanyon to about 0.5 mile south of Camper Flat.

Between about 180 and 163 million years ago, our area underwent change. The seafloor was raised, and some of the upper sediments of the Sailor Canyon formation were eroded and redeposited elsewhere. Atop this formation, there developed the thick Tuttle Lake formation, which accounts for the upper two-thirds of the roof pendant. The lower part of the formation is composed mostly of chaotic volcanic sediments associated with submarine volcanism. The nature of the formation changed with time, becoming increasingly dominated by basaltic and andesitic lava flows. Some of these formed underwater to become pillowed flows. The seascape, which back then lay in a tropical setting, may have resembled today's volcano-rimmed, earthquake-prone Molucca Sea of central Indonesia.

Remnants of the Tuttle Lake formation exist as a generally east-west band that extends from the lower Glen Alpine Creek drainage west to Susie Lake and Jacks Peak and from Mount Tallac west to Half Moon Lake and Dicks Peak (and along the ridge north from it). Because peaks, ridges, cliffs, and slopes have developed in this formation, it is very prominent, painting the east-central part of Desolation Wilderness in earth tones. In contrast, the equally colorful Sailor Canyon formation often goes unnoticed, for it exists largely amid talus and vegetation of generally bottomlands and lower slopes.

Whereas volcanoes developed in this area and produced lava or *tephra* (ejected material, ranging from fine ash to huge blocks), part of the molten material that fed the volcanoes solidified within them or close to the surface of adjacent bedrock. Magma that produced basaltic lava also solidified to form subsurface gabbro, and magma that produced andesitic lava solidified to form subsurface diorite. You see



Above Lake Schmidell's west shore, dark diorite, or gabbro (left), contrasts with light granodiorite. The latter breaks apart to form blocky talus, which supports fewer plants.

quite a lot of these dark, intrusive rocks along Hike 7, first from before Maud Lake and most of the way up to Rockbound Pass, and then from Lake Lois to Lake Schmidell. Likewise, each of the three Velma Lakes (Hike 20) is almost entirely surrounded by diorite or gabbro, as is the floor of the canyon that descends northeast from them to Emerald Bay.

The Sierra's most common intrusive (plutonic) rock is granodiorite, a rock that gives the range its characteristic light-gray color. It and closely related forms (granite, alaskite, quartz monzonite) are often called granitic rocks. During this time of volcanism, some magma cooled to form granitic plutons, and four remain today. These are, from oldest to youngest, Keiths Dome quartz monzonite (area bounded by Ralston Peak, Echo Peak, and Heather Lake), Pyramid Peak granite (crest lands from that peak north to Red Peak), Desolation Valley granodiorite (in its namesake and in upper Rockbound Valley), and Camper Flat granodiorite (Phipps Peak west across Camper Flat to Highland Lake and beyond).

Uplift, Metamorphism, and More Plutonism

The Sierra Nevada finally became a mountain range during the Nevadan orogeny, a compressional event that in our area lasted from about 163 to 143 million years ago. During this time, five terranes (pieces of the earth's crust) were individually compressed against and then accreted (attached) to lands west of our area. Each compression

probably caused some uplift, and after the last one our area had reached much greater elevations than those of today. Each compression also probably caused some metamorphism of the existing rocks—that is, transforming them through heat and pressure. Sedimentary rocks became metasedimentary ones, and volcanic rocks became metavolcanic ones, and they were both folded and faulted.

Compression can thicken continental crust only to a certain extent before it becomes too heavy to be supported by the underlying plastic, slowly deforming rock. As the underlying rock began to flow, the newly formed Sierra Nevada began to extend apart, and its crust thinned, in part fracturing the existing plutons. This rifting greatly facilitated the upward flow of deep-seated magma, and the range entered a period of voluminous volcanism and plutonism. Large volcanoes developed on the surface, while large bodies of magma just below them solidified to form plutons. The oldest post-orogeny plutons are about 143 to 140 million years old, and on US 50 East you drive past their exposed granitic rocks first near the west part of Placerville and then later from about Riverton onward for several miles.

Many of the granitic rocks found in Desolation Wilderness and the lands south of it are considerably younger. Here a second group of plutons developed that are about 100 to 85 million years old. They, too, once had volcanoes and lava flows above them, but all that has been removed. This is because the magma that produced the granitic plutons produced volcanoes of rhyolite and dacite. These rocks solidified from lava so stiff, viscous, and gas-charged that violent eruptions often resulted, producing voluminous ash deposits. These were readily eroded and deposited as sediments in the Central Valley. Pasty rhyolite and dacite flows that developed in our area were weathered and eroded over time so that they, too, no longer exist. Unlike the earlier basalt and andesite flows, these were never metamorphosed into more-resistant rocks.



Development of a Granitic Landscape

The extension that caused voluminous volcanism and plutonism also rifted the crust along faults. The crust immediately east of the wilderness was downfaulted, creating the Truckee–Lake Tahoe depression. (Lake Tahoe formed much later). Other depressions also were created along faults, including the Mono Basin and Owens Valley.

A 5-foot-long granitic boulder carried in volcanic mudflow

Roughly 80 million years ago and continuing perhaps for one to several million years, the upper crust of the central Sierra Nevada collapsed, perhaps due to the cessation of plutonism in the range. Apparently the range's upper crust was faulted along a detachment fault, one that separated the brittle upper crust from the ductile, slowly deforming lower crust. With the weight of several miles of thickness removed, the lower crust raised to roughly its present height. Back then, dinosaurs roamed the Sierran lands, until their extinction 65 million years ago.

The climate during the days of the dinosaurs was tropical, and after their demise it still remained moist and warm until about 33 million years ago, when it began to change toward California's modern summer-dry climates. Under moist and warm climates the sedimentary and volcanic rocks weathered and eroded quite rapidly, and the tops of granitic plutons were exposed in as little as several million years. By 65 million years ago, our area, like most of the Sierra Nevada, had become a largely granitic landscape. By 33 million years ago, this landscape had evolved to one extremely similar to today's granitic landscape—indeed, you could have used today's topographic maps.

Volcanism and Burial

The last pulse of uplift rejuvenated erosion, and coarse sediments were deposited in the lower parts of some drainages. The most important locale, geologically speaking, is the South Yuba River drainage in the vicinity of Malakoff Diggins State Historic Park, north of Nevada City. Minor remnants of these prevolcanic auriferous (gold-rich) gravels let us reconstruct the topography that they buried some 50-plus million years ago. What they show is that the South Yuba River canyon back then was essentially as deep as it is today. And, as Waldemar Lindgren stated back in 1911, the range was just as high.

The 33-million-year date, besides marking climate change, marked the beginning of renewed volcanism. At first there were infrequent, if violent, eruptions of rhyolite. With time, however, there were sufficient eruptions to bury the granitic landscape under as much as 1,000 feet of rhyolite, as it did in the Plum Creek drainage south of Riverton. As with the prevolcanic gravels, remnants of rhyolite let us reconstruct the topography they buried. One rhyolite remnant, dated at about 26 million years, buries part of a gully cut through granitic bedrock. This lies just outside our area, about 2 miles east-northeast of the Upper Truckee River's Round Lake (no rhyolite has survived in our area). The remnant shows that this gully above Scotts Lake is not the result of relatively recent glacial erosion, but rather that it had already existed at the time of burial.

The rhyolite outbursts lasted until about 20 million years ago, when floods of volcanic lava, volcanic mudflows, and volcanic sediments, chiefly andesite in composition, began to inundate the range. (Andesitic volcanism actually *began* earlier, by about 26 million years ago, and it overlapped the waning stage of rhyolitic volcanism.) Geographically centered in the Tahoe area, these deposits extend from the Feather River country south to northern Yosemite National Park. They collectively have been called the Mehrten

formation, although more recently this has been subdivided into various units. They eventually covered part of our area with as much as 3,000 feet of deposits. Even though volcanism was relatively intense, the volcanic landscape was usually quiet, for eruptions were probably no more common than those in today's Cascade Range. In our area the andesitic volcanism, like the earlier rhyolitic volcanism, was largely restricted to south of US 50. The greatest andesitic volcanism was in the headwaters of the Upper Truckee River, as seen along Hikes 30–32. In contrast, Desolation Wilderness largely escaped burial by both periods of volcanism, standing high as an island of granitic and metamorphic rock. Where volcanic deposits were expansive, new rivers originated and carved shallow canyons in them, and these took paths quite different from those of the underlying former rivers. Occasionally a large lava flow would descend one of these shallow canyons, the best example being the 9-million-year-old Table Mountain flow in the Stanislaus River drainage, south of our area. Between 9 and 5 million years ago, the largely andesitic volcanism waned, causing erosion to outpace deposition, and the old river canyons were exhumed.

Creation of Lake Taboe

As was mentioned earlier, the basin that now holds Lake Tahoe began to form late in the days of the dinosaurs. Over tens of millions of years the bedrock of this Truckee– Lake Tahoe fault-formed basin weathered and eroded. By 33 million years ago, when the climate began to evolve toward the modern one, the southern half (Lake Tahoe part) of the basin had topography that closely resembled today's. Freel Peak, to the east of our area, back then was the basin rim's highest peak, as it is today, and it may have towered over 6,000 feet above the basin floor.

The lake began to form about 2.25 million years ago when lava erupted in the northern half of the basin, creating a volcanic dam and effectively impounding water south of it. Between 2.25 and 1.25 million years ago, there were at least seven major lava flows, which at times dammed the lake as much as 800 feet above its current 6,229-foot level. However, the lake's outlet, the Truckee River, continued to erode through successive flows. Faulting accompanied volcanism in the northern half, but apparently not in the southern half. Geologists nevertheless have mapped a major contemporary fault running along the west side of the lake, despite a lack of field evidence. In particular, the thick volcanic deposits at the head of the Upper Truckee River drainage should have been displaced, but no fault movement has been found.

Concluding our look into the origin of Lake Tahoe, we might note that the processes that brought about its creation, early faulting and late volcanism, also denied it national-park status. That is because some of the volcanic rocks laid down just east of the Lake Tahoe Basin were faulted, the most famous one being the Comstock fault. Along it, silver, gold, and mercury were injected, creating the Comstock Lode. When it was discovered in 1859, a tide of miners flooded the mining area, and waves of others came to the Tahoe area to cash in on the wealth (see Hike 28 for a bit of mining history). The Tahoe forests were raped for mine timbers, buildings, and firewood, while the mountain meadows were desecrated with livestock that helped feed the hungry hordes. In the Lake Tahoe Basin, traffic used a growing network of roads, while laden steamers plied Tahoe's easily navigable waters. Desolation Wilderness, in contrast, was largely spared, except for the livestock. There were no minerals to mine, and because glaciers had removed soils, the trees that grew there were too sparse to be lumbered.

Glaciation

As was just stated, Lake Tahoe owes its origin to a volcanic dam. Back in the 19th century, many believed it had originated after glaciers, through powerful erosion, had excavated a deep basin, which then filled with water. Although this long-persisting myth has just about died, the equally long-persisting myth of glaciers as major erosive agents is still alive and well. What glaciers do best is transport rockfall; in *resistant* bedrock, they erode very little. Glaciers also accelerate the rate of rockfall production (see discussion of exfoliation in Hike 4, Pearl Lake), which explains why glacial deposits are both so bouldery and so voluminous.

In the Tahoe area, small glaciers may have appeared sporadically as early as 15 million years ago. Major glaciation, however, did not begin until about 2 million years ago. Since then the landscape has been appreciably glaciated perhaps four dozen times. During each major glaciation, glaciers advanced over deposits of previous glaciations, eradicating evidence of their existence. The best glacial records lie not in mountain ranges but rather in ocean sediments, which record alternating periods of glaciation and interglaciation (like the one we are in now). In our area there remains evidence from only two glaciations, the Tahoe and the Tioga. The Tahoe existed from about 200,000 to 132,000 years ago, the slightly smaller Tioga from about 28,000 to 13,000 years ago (although some believe that glaciers were mostly gone by as early as 16,000 years ago). There may have been up to three glaciations between these two, but their glaciers were smaller than the Tioga's; hence no direct evidence of them has survived.

From Desolation Wilderness's west-side Crystal Range, Tahoe glaciers coalesced to form an ice sheet that advanced as much as 10 miles downslope, reaching Union Valley Reservoir. An ice cap formed over the southern half of the wilderness, and glaciers spilled outward from it in all directions. The largest one flowed north through Rockbound Valley and down the Rubicon River canyon, ending some 30 miles from its source near Mosquito Pass. As such, it rivaled the Tahoe glacier that flowed through Yosemite Valley. At most, some glaciers on the wilderness's east side advanced about a mile or so beyond Lake Tahoe's west and southwest shores, spewing icebergs into the frigid water.

South of the wilderness, glaciers west of the Sierra Crest were relatively small. However, just east of it existed an enormous glacier, 20 miles long, which originated at the Round Top mountain ice cap and spilled northward into the Upper Truckee River



drainage and descended to Lake Tahoe. Because the range above the lake's west shore collected most of the precipitation, the one above its east shore lacked sufficient snow

Author's reconstruction of glaciers in the Fallen Leaf Lake quadrangle, showing their maximum extent during the Tahoe glaciation, which occurred from about 200,000 to 132,000 years ago. Glaciated lands are shown in white, nonglaciated lands in gray. Today's lakes, roads, and wilderness boundary are shown as dashed black lines. The water level of Lake Tahoe back then was up to 90 feet higher; hence its larger size. In Desolation Wilderness, only the major peaks and crests stood above glacier ice, but just south of US 50 the lands remained largely unglaciated.

and ice to develop glaciers. However, in the Freel Peak area above the south shore, two north-draining glaciers reached lengths of about 4 miles.

Glaciers not only discharged into Lake Tahoe; a few large ones managed to dam it. These glaciers descended east to the north-flowing Truckee River—Lake Tahoe's outlet stream—and blocked its flow. The glacier dams were immense, high enough to raise the lake's level by 600 feet during an early glaciation. But when water pressure became too great, the ice dams broke, sending an inconceivably large wall of water down the Truckee River canyon. During the Tahoe glaciation, one or more glacier dams raised the lake by 90 feet. Consequently, the lake was larger, and it expanded south over the South Lake Tahoe plain and into the lower part of the Upper Truckee River canyon. Lakebed sediments were deposited in both areas. During the Tioga glaciation, the glaciers were a bit shorter, and apparently no ice dam formed in the Truckee River canyon. Newer research, done in the late 1990s, indicates that major submarine landslides have occurred within the lake, creating tsunamis (tidal waves). Therefore, the aforementioned inconceivably large walls of water down the Truckee River canyon could have been from broken ice dams, tsunamis, or both.

When the Tioga glaciers finally retreated into oblivion about 13,000 years ago, they left behind moraines, which are accumulations of material—mostly rockfall—that the glaciers had transported. In the area covered by this book, the Tahoe- and Tioga-age moraines are most conspicuous about Fallen Leaf Lake (Hike 12), Cascade Lake (Hike 19), and Emerald Bay (Hike 21). There, lateral moraines formed as boulders carried atop the glaciers fell from their sides, accumulating as a veneer on bedrock ridges. By viewing these moraines, which would have been slightly lower than the surfaces of the glaciers responsible for them, one can visualize the length and thickness of the glaciers. The accompanying map—the extent of glaciers during the Tahoe glaciation—is based on such evidence. Note that most of the area lay under glacier ice.

Overall, glaciers did not radically transform the landscape. Glaciers may have been effective erosive agents only in the Upper Truckee River canyon. There the thick volcanic sequence that had buried the canyon, which is composed of volcanic silts, sands, gravels, and a few thin lava flows, is readily credible. However, most of this sequence would have been removed by the Upper Truckee River in the approximately 10 million years it had to erode before glaciation. When glaciation commenced, the buried granitic surface of the upper drainage may have been largely exhumed or else may have lain under a thin layer of volcanic sediments.

Before glaciation, granitic bedrock locally had undergone considerable weathering, particularly on flat-floored canyon bottoms, where the weathering front penetrated along fractured bedrock. Glaciers removed this weathered bedrock, excavating hollows that then became today's lakes. Had Desolation Wilderness been volcanic rather than granitic, it would have been virtually lakeless. Superficially, Round Lake in the Upper Truckee River drainage (Hike 30) seems to be completely rimmed by such rocks, but closer inspection reveals granitic rocks along its floor and its west shore. In addition to excavating generally shallow lake basins, glaciers have modified the landscape by accelerating two processes of mass wasting. First, they have caused accelerated rockfall due to pressure release. Large, thick glaciers exist for thousands of years, and their mass applies considerable pressure to the bedrock. When they melt away, which happens rather suddenly, the bedrock becomes depressurized. Slopes and cliffs then undergo accelerated mass wasting, spalling rock slabs that break and accumulate below as talus (which future glaciers will remove). Second, because glaciers produce extremely cold local climates, freeze-and-thaw prying of rocks is also accelerated. This is particularly true at the heads of glaciers, where snowfields today linger long into summer. Conventional wisdom has held that cirques developed as the heads of glaciers plucked away at the adjoining bedrock. However, a bergschrund (the glacier's uppermost crevasse) separates the ice from the wall—plucking cannot occur where there is no contact.

Parts of our area remain almost as pristine and desolate as the day the glaciers left them, for in areas of soil-free bedrock, the granite has weathered only a fraction of an inch in the last 13,000 years. But hardy plants and animals have adapted to this bleak environment. A sparse number of drought-tolerant conifers, shrubs, and wildflowers painstakingly work away at granitic cracks, gradually enlarging their roothold on the land as they change it for their benefit and that of future plants. Animals such as marmots and pikas dwell in talus slopes of granitic rock, stirring up its sterile gravel as they shape their burrows. Their food scraps and feces add nutrients to the gravel, enriching it for plants. Thus plants and animals slowly change the environment to better suit themselves even as the environment is influencing evolutionary changes in them.

BIOLOGY

Introduction

To adequately cover Tahoe's plants and animals, their interrelationships, and how they influence—and are influenced by—the environment is a difficult task to do in only a few pages. You can find a book or two on each Sierran life-form and its ecology: wildflowers, shrubs, trees, birds, mammals, and so on (see Source Materials, page 164). Most amateur naturalists exploring the Tahoe area come to view its wildflowers and birds. For wildflowers, use Niehaus and Ripper's *Field Guide to Pacific States Wildflowers*, which covers a very large area but nevertheless does a good job of identifying the Sierra's common wildflowers. (The common names for wildflowers presented in this section are based mostly on that guide. Where alternate common names exist, these are mentioned in parentheses.) If you prefer color photos to botanical keys, try Graf's fairly complete *Plants of the Tahoe Basin.* Its primary drawback (besides its virtually useless index) is that you will have more than 220 pages of photos to pore over, so for the book to be effective, you've got to memorize the photos. A key would be useful, and for that, get

Weeden's comprehensive *A Sierra Nevada Flora*, which is for those doing serious plant study. Horn's *Sierra Nevada Wildflowers*, which has some species beyond our area, may be better than Graf's book, simply because it has fewer photos to pore over, and they are larger. For serious plant study, lug along Hickman's hefty authority *The Jepson Manual: Higher Plants of California.* Finally, for a comprehensive introduction to the area's flowers by a competent, vivacious botanist who is obviously enamored by them, get Carville's *Lingering in Taboe's Wild Gardens*, which not only mentions flowers seen along 30 Tahoe trails but also gives fascinating details about each. Even if you never hike a trail, simply reading her book will give you quite a thorough education in wildflowers.

If birds interest you, carry the authoritative *Sibley Guide to Birds*. Also bring along, or study beforehand, Games's *Birds of Yosemite and the East Slope*, which is very fitting for Tahoe species. Arranging birds by habitat, this guide makes the identification of hard-to-view birds an easier task. If you're interested in all aspects of nature, carry Storer and Usinger's *Sierra Nevada Natural History*, which, though dated, is still perhaps the best introduction to the range's plants and animals.

Habitats

When you hike in the mountains—or anywhere, for that matter—you anticipate seeing certain plants and animals in a given habitat. You quickly learn, for example, that junipers don't grow in wet meadows, but corn lilies do. Corn lilies, in turn, don't grow on dry rock slabs, but junipers do. Likewise, you would expect to find garter snakes in wet meadows and western fence lizards on dry rock slabs, but never the reverse. Thus you could group plants and animals by their habitat. In this book, habitat classifications are based on the dominant plant or plant types that exist there, simply because these are the most readily observed life-forms. Some habitats are based on topography.

Because animals move, they may be found in more than one habitat. Birds, for example, typically have a wide—usually seasonal—range, and therefore span many habitats. In this section, a species is mentioned in the one in which a summer visitor is most likely to see it. In addition, only the more prominent and/or diagnostic species are mentioned. The habitats are listed in an approximate order of ascending elevation and decreasing temperature.

1. White-Fir Forest

Most of this book's trails begin in the upper reaches of this habitat, where white fir is yielding to red fir. In our area this community of plants and animals is best expressed along Loon Lake (Hike 1), near the shores of Lake Tahoe (Hikes 21 and 24), Emerald Bay (Hikes 21 and 22), and Fallen Leaf Lake (Hike 12). White fir is the dominant conifer, subordinated by ponderosa pine. Also present, usually on drier, more open terrain, are Jeffrey pine, sugar pine, and incense-cedar.





Mule-ears

Spreading phlox

Of all this book's habitats, this is the one most likely to erupt into a raging forest fire. *Natural* fires are definitely associated with it. These fires, if left unchecked, burn stands of mixed conifers about once every 10 years. At this frequency, brush and litter do not accumulate sufficiently to result in a damaging forest fire; only the ground cover is burned over, while the trees remain generally intact. Thus, through small burns, the forest is protected from going up in smoke. Eventually, however, it does, since the trees mature, reach old age, and then begin to die. Abundant dead trees, either fallen or standing as snags, invite a conflagration. Some plants are well adapted to fire, and they rapidly invade in the aftermath. (Logging, landslides, and other disruptive elements also bring about invasions.) A patch of charred white-fir snags is likely to be quickly overgrown with tobacco brush; greenleaf manzanita; and, briefly, fireweed.

Many plants and animals found in the white-fir forest are also found in the red-fir forest. Bird-watchers, however, might note a few species that definitely prefer the whitefir forest. On its conifers, white-headed woodpeckers punch through the bark to reach wood-boring insects with their long tongues. White-breasted nuthatches descend the trunks headfirst, looking for insects in bark crevices, while brown creepers spiral upward in search of the same. Higher up in the trees, western tanagers, like Hammond's flycatchers, dart out from the foliage to capture flying insects, though at berry time they're more likely to forage in nearby shrubs. Hermit warblers prefer to stay in the tree foliage, hunting for insects among the branches and needles.

2. Jeffrey Pine-Huckleberry Oak Woodland

In areas of deep soils, white-fir forest grades upward to red-fir forest. Jeffrey pine, a constituent of both, comes into its own where soils become thin, if not downright barren. You may see a healthy specimen seemingly growing right out of a rock slab and, if the day is warm and a gentle breeze blows your way, you may detect the faint butterscotch odor wafting from the furrows of its rusty bark. In spots, shaggy-barked western junipers share the dry bedrock environment, exuding their own inviting odor. And where volcanic soils abound, fields of mule-ears and paintbrush may carpet the open-forest slope and lace the air with their distinctive aromas.

But far and away the most common plant associate of the Jeffrey pine is the huckleberry oak. Usually waist-high, this drab, dusty, evergreen oak can form dense, almost impenetrable thickets with occasional Jeffrey pines breaking the monotony. Such thickets are most likely to form on dry *granitic* slabs and benches. As soils deepen and retain more water, other shrubs appear: greenleaf manzanita, tobacco brush, and bitter cherry. If the soil deepens but remains very dry because it is so gravelly, then snowbush, which because of its spiny tips is also known as mountain whitethorn, joins the huckleberry oaks and Jeffrey pines.

The rocky slabs are seasonally colored with wildflowers. Perhaps the most diagnostic one of this habitat is mountain pride, or Newberry's penstemon. Few wildflowers care to share its masochistic habit, but three that do are spreading phlox, woolly sunflower, and Sierra stonecrop. This dry, rocky environment is ideally suited for western fence lizards, which do push-ups to "scare" you away, should you get too close. The western rattlesnake is another resident, which buzzes at you for the same reason. Chances are you won't see one as you hike the Tahoe landscape. In this habitat the golden-mantled ground squirrel is its main prey.

The sagebrush lizard, a western fence lizard look-alike, prefers dry, gravelly soils. So do a lot of wildflowers. Sunflowers lead the way, with Brewer's daisy, leafy daisy, Anderson's thistle, and yarrow. However, Bridges' penstemon, showy penstemon, Applegate's paintbrush, scarlet gilia (desert trumpet), Leichtlin's mariposa lily (tulip), and western wallflower are also bound to catch your attention. In very gravelly soils grow pussy-paw, mountain jewel flower (streptanthus, or shieldleaf), Brewer's lupine, nude buckwheat, and sulphur eriogonum (also a buckwheat).

A few Sierran birds definitely prefer this dry, often shrubby environment. Fox sparrows and, to a lesser extent, green-tailed towhees flit about the shrubs, while coveys of mountain quail dart about on the ground. On rockier ground, Townsend's solitaires invade junipers when their berries ripen, while Lewis's woodpeckers occasionally visit Jeffrey pines.

3. Red-Fir Forest

On the broad, gentle-sloped uplands between the Sierra's mighty river canyons, the red-fir forest can form large, pure stands. In our area, however, canyons and crests characterize the landscape, so the red-fir forest is very heterogeneous. Nevertheless, in its elevation range the red fir accounts for more timberland than lodgepole, Jeffrey, or western white (silver) pine. Most of this book's hikes are up canyons—red-fir country—to lakes, passes, and peaks, so you'll spend most of your *hiking* time in a shady forest.

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ABOUT THE AUTHOR



Jeffrey P. Schaffer made his first backpacking trip in a 1962 traverse of the Grand Canyon, at age 19. The following year the climbing frenzy seized him and lasted until about 1972, some 200 roped ascents later. In that year he began working on his first book for Wilderness Press, *The Pacific Crest Trail*. Between then and the late 1980s, he was the sole or principal author of 12 guidebooks and had mapped about 4,000 miles of trail for his books and 15-minute topographic maps. Innumerable observations while hiking made him seriously question conventional geological wisdom on the origin of mountain ranges, which led him to write a lengthy book on the origin of the Sierra Nevada land-

scapes, particularly Yosemite Valley. He taught geology and geography at a number of colleges, especially Napa Valley College, from which he retired in 2015. As of 2020 he still does occasional fieldwork on Sierran uplift and glaciation, a project begun in 1990, and hopes to get at least one major paper published in the near future.

Other Wilderness Press books authored or coauthored by Jeff include Hiker's Guide to the High Sierra: Yosemite and Tuolumne Meadows; Pacific Crest Trail: Southern California; Pacific Crest Trail: Northern California; The Pacific Crest Trail: Oregon and Washington; Lassen Volcanic National Park and Vicinity; Yosemite National Park; The Tahoe Sierra; Hiking the Big Sur Country: The Ventana Wilderness; and The Geomorphic Evolution of the Yosemite Valley and Sierra Nevada Landscapes.



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