SPECIAL REPORT ON A WILDLIFE STUDY OF THE HIGH SIERRA IN SEQUOIA AND YOSEMITE NATIONAL PARKS AND ADJACENT TERRITORY

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The saddle horses and pack stock used on the trip were the personal property of the writer or of Mr. McLellan. Rather more than the usual daily mileage for travel of this sort was made, as we averaged twenty miles per day and on some days made thirty five. None of the expense of transportation, feeding or any other maintenance cost of the animals was borne by the government.

Itinerary and Annual Leave

Originally it was calculated that hardly any more time would be required to travel directly through the mountains from the back country of Sequoia and Kings Canyon to Devils Postpile and the back country of Yosemite then would be needed to make the long, roundabout trip from the back country of Sequoia down to headquarters, thence by auto down into the San Joaquin Valley and north up the main highway to Yosemite, and then back into the high country again. The intent was to follow the John Muir Trail from Sequoia to Yosemite and thus gain a better knowledge of conditions in the high Sierra - in which the writer had never been before - than would otherwise be possible.

Actually it turned out that due to heavy snows and a late spring, considerable portions of the John Muir Trail were still impassable, necessitating long detours over difficult and seldom used trails, so that a week’s time was lost from this cause. Accordingly, all time over and above that which would have been required to make the trip over the usual auto route through the San Joaquin Valley was charged by the writer to annual leave. The observations made during this leave period are an integral part of the whole picture, however, and have been incorporated in full into this report.

The detailed itinerary of the trip is given under the various areas treated below.
SEQUOIA NATIONAL PARK

Itinerary

The route was from Ash Mountain to Hospital Rock and thence up the Middle Fork of the Kaweah River to Little Bearpaw Meadow. From Little Bearpaw the High Sierra Trail was followed across the Chagoopa Plateau and up the Kern Canyon; on the Chagoopa Plateau a side trip was made northward up to Red Spur to investigate the "Kaweah Basin Reserve" and another side trip was taken from Big Tuley into Little Five Lakes basin. From Kern Canyon the seldom used trail up Tyndall Creek was followed, via the Bighorn Plateau, to Shepherd Pass, and thence to Independence for supplies.

Ash Mountain - Hospital Rock Area

Trail Conditions. A well maintained stock trail connects Ash Mountain with Hospital Rock but it is very seldom used, and while there is no inducement to hikers to take this route because the automobile highways parallels it.

Middle Fork of the Kaweah

General Aspects. The Middle Fork of the Kaweah River traverses a precipitous transition zone country of rather high summer temperatures where dense chaparral growth and Canadian forest meet.

Wildlife. The steep densely forested, north-facing slopes on the south side of the river constitutes an inaccessible refuge for such forest dwellers as the cougar and fisher; in fact most of this area comprises the important "Fisher Reserve" which was recently set aside. On the same side of the river but higher up in the rugged granite country, is located the scenically spectacular Granite Creek Reserve which was set aside by the park administration for the study and protection of the golden trout (photos of these reserves were taken but were spoiled).

The chaparral-clothed south-facing slopes of the Middle Fork area afford abundant food and cover for deer, bear and grouse.

Bear. Droppings noted July 17 along the trail indicated a heavy diet of manzanita berries, with which the bushes are heavily laden at this season.

At Little Bearpaw Meadow a large male and two yearling cubs were present. The latter came to the edge of camp and showed interest in our grub. They had previously dug up partially buried garbage left by a previous camping party and had become camp-conscious as a result of this experience, although as yet they were not so badly spoiled as to attempt a raid on our supplies. If campers would burn all garbage, including tin cans (which would thereby
lose their odor of food), the majority of bears would not acquire the camp robbing habit. It is therefore suggested that CCC spike camps and similar work crew camps be required to burn all such refuse after each meal, thereby avoiding much of the trouble which they sometimes have at present.

Sierra Grouse. Covey of approximately five 3/4 grown young, with parent, noted on July 17 at Little Bearpaw Meadow.

Ground Squirrel. Present, but not abundant, at Little Bearpaw.

Coyote. Heard one howling on the night of July 17 at Little Bearpaw. The voice of the coyote when heard in the evening around the campfire adds the final touch to the wilderness setting. Its appeal to the park visitor under such conditions is often very great.

Trail Conditions. The Middle Fork trail is a good example of a wilderness trail—entirely adequate for stock or foot travel but not conspicuously artificial in appearance (Fig. 1).

Fig. 1.

Middle Fork trail,
Sequoia National Park. This simple trail is adequate for travel but is not conspicuously artificial. Transition between chappel and coniferous forest is shown.
Special Report on a Wildlife Study of the High Sierra in Sequoia
and Yosemite National Parks and Adjacent Territory

INTRODUCTION

Justification

From time to time in the past various comments — some of them in a
rather humorous vein — have been made to the effect that whereas the
regional field men of the technical branches are markedly active in
making hurried visits to the headquarters of the parks and monuments
in their large territories, yet such persons have often displayed but
slight first hand knowledge of the surrounding park territory and only
a limited grasp of the fundamental problems related thereto.

Since there seems to be no way of avoiding the necessity of submitting
technical comments on local park problems from a more or less distant
central office, it becomes the duty of those who have to make the
comments to avoid this form of criticism by knowing the regions in
question. It is for this reason, namely to become acquainted with a
hitherto unfamiliar region, in which a large number of ECW projects
have been initiated in the past that the writer made the present study.

Scope of Subject Matter

Without a doubt the present period is one of change on the High
Sierra. Some of the conditions here recorded are the product of earlier,
more primitive times and probably will not last much longer. For this
reason the following report includes various observations which are not
always directly connected with wildlife but which seem worthy of record
so that they can be compared with later developments, and because they
may be of use to persons not personally acquainted with the region. In
treatment of subject matter the aim has been to avoid a narrow, strictly
wildlife point of view in favor of the broader consideration of wilderness
values.

Equipment and Assistance

The trip was made in company with Mr. A. B. McLellen who is a friend
and neighbor of the writer and an experienced mountain man who lived for
a considerable time in the Sierra Nevada years ago. Mr. McLellen kindly
volunteered to go along for the pleasure of the trip. His detailed knowledge
of trail conditions and the condition of the range fifteen years ago, when
most of the country which we traveled was heavily sheepe or grazed by
cattle, was especially valuable as a basis of comparison with conditions
in the same places now.
The zigzags on the short cut trail up to Little Bearpaw Meadow are steep, but their very primitiveness contributes to the wilderness atmosphere in a way that a sophisticated, engineered pathway cannot do.

**Administrative Problems.** Superintendent White called attention at the beginning of the trip to the fire hazard condition in the Middle Fork area, pointing out that in this region, where the inflammable chaparral adjoins the forest, the danger of fire is particularly great, because considerable numbers of fishermen travel up and down the river. Superintendent White stated that a truck trail up the Middle Fork is necessary in order to give adequate fire protection to the area.

**Big Arroyo and Chagoopa Plateau**

**General Aspects.** From the Middle Fork Country one climbs rapidly upward toward the summit of the Great Western Divide, which rivals the main Sierra crest in height and spectacular beauty. In dizzy zigzags the High Sierra Trail scales the granite slopes, until the forest is left far below. At length it crosses the divide at Kaweah Gap around whose crests the thunder rumbles, and enters the long alpine meadow at the head of Big Arroyo. Chagoopa Plateau is a high spacious rather sandy table land, mostly forest-covered but also with many meadows, of which Sky Parlow Meadow is the largest, and several lakes and ponds.

**Wildlife.** Deer. Evidently rather common in Big Arroyo and on Chagoopa Plateau.

**Kaweah Basin Reserve.** It was hoped that a trip could be made into the remote Kaweah Basin Reserve, but the difficulties attendant upon penetrating this mountain-ringed area, to which no trail has ever been built, prevented the writer from crossing its barriers during the time at our disposal.

From the Chagoopa Plateau side a series of lofty ridges bar the way except at the southern end of Red Sour, where it appears that an entrance might be gained, through the thick timber (Fig. 2; see also Figs. 5, 9).

Mr. Joseph Dixon has stated that so far as he knows the only human beings who have entered the region in recent years are: Vernon Bailey (between 1930 and 1933), a fish planting crew (judged by the presence of fish to have entered some time prior to 1934), Branch of Forestry type mapping crew (1933), Joseph Dixon (1934). Several old-time mountain men at Independence, Florence Lake, and Kings Canyon who were interviewed by the writer knew the location of the Kaweah Basin very well but only one of them (Mr. Gates of Independence) had ever been in there.

As pointed out in a "Report on Research Reserves Proposed for Sequoia National Park" (October 9, 1935), the Kaweah Basin Reserve ideally fulfills the requirements of a research reserve. On the other hand, the inaccessibility imposed by its great natural barriers renders it unattractive to the passing tourist; moreover in the event that such a visitor should gain entrance to the area, he would find nothing there which was not abundantly available in the surrounding country. For these reasons it is earnestly recommended that
Fig. 2. View from the northern end of the Chuggeta Plateau, showing the mountain barrier which surrounds the Kaseen Basin Reserve (the latter here invisible). No trail penetrates this remote glacial basin, which lies on the other side of these mountains, with the result that its primitive conditions have remained practically undisturbed. Dotted line indicates location of reserve boundary along mountain crest.
for the sake of preserving intact a biological area which has existed with scarcely a change for untold centuries, no additional plants or fish be made in the Kaweah Basin.

**Trail Conditions.** Unlike the Middle Fork trail the High Sierra Trail is heavily traveled. The tread is wider, the gradient less steep, and evidences of artificial construction are more obvious (Fig. 3), but the greater elaborateness is largely imposed by the need of rock retaining walls when traversing the steep granite slopes. The tread is about three feet wide; anything wider than this would be superfluous, since a trail of sufficient width to permit pack animal to pass each other without one of them stepping off the trail would have to be 6 feet wide, which is a roadway. Provided proper clearance is allowed for the pack, the widening of a trail beyond three feet for the "safety" of pack or saddle stock would be superfluous because the animals tend to walk on the extreme outside edge of the trail no matter how wide it is.

![Fig. 3. High Sierra Trail on descent from Moraine Lake to Kern Canyon](image-url)
Fig. 4. Kern Canyon has a magical atmosphere of solitude which would be destroyed if an auto road were ever built into it.

Fig. 5. Kern Canyon as seen from the bridge at Upper Fumston Meadow. An idea is given of the charm of the place in its present primitive state.
Kern Canyon

General Aspects. Kern Canyon is a long, narrow, almost straight gorge which runs for many miles into the heart of the mountains between walls of nearly perpendicular granite (Fig. 4). At present it is a remote, unspoiled valley of restfulness and quiet. While perhaps not quite as spectacular as Kings Canyon it has about it a certain magical atmosphere of solitude (Fig. 5) which will be destroyed in the latter area with the completion of the automobile road. In its present primitive state (Figs. 6-8) Kern Canyon is unique; with a road up the center it would become just another mountain resort, inferior in scenic value to many of the others, definitely cheapened by citified sights and sounds.

Fig. 6. The Kern River bridge near Upper Punston Meadow. Adequate, but not ornate, this bridge fits well into the primitive picture.
Fig. 7. The bath house at Kern Hot Spring, Kern Canyon. This simple little structure is made of unshaved timbers and shakes secured in the vicinity. The minimum of artificiality is presented.

Kaweah Basin Reserve. In traveling through Kern Canyon one skirts the Kaweah Basin Reserve on the east side, but the two thousand foot wall of the canyon constitutes an insurmountable barrier to any approach from that direction (Fig. 8). At the head of the canyon, where the torrential Kern-Kaweah River joins the Kern River, if one looks westward up the granite stairway down which the Kern-Kaweah tumbles, one sees the precipitous north boundary of the reserve, and also, in the far distance, the spire-like pinnacles of the Red Kaweah, Black Kaweah and Kaweah Peaks Ridge which form the formidable south-west boundary (Fig. 9).

Administrative Problems. Proposed GCN Projects. The projects to be described received wildlife clearance March 15, 1936, but it was desired that field studies should be made and additional information gathered regarding them as soon as possible.

No. 146-109 Buildings, Contact Stations. Of the 3 locations proposed the following were visited: Upper Funston Meadow, Upper Tyndall Creek, Big
Fig. 8. View down Kern Canyon from about opposite Whitney Creek. The nearly perpendicular canyon wall forms an insurable barrier to penetration of the Kaweah Basin Reserve from the east.
Fig. 9. View looking east from the High Sierra Trail two miles above Junction Meadow. Shows the fortress-like east and north boundaries (dotted line) of the Kaweah Basin Reserve. In the far distance (upper-right) can be seen the formidable pinnacles which guard the basin from approach from the south-west; the wide angle lens of the camera used fails to reproduce the massive proportions and the awe-inspiring perpendicularity of these distant peaks (RS-Red Spur, RK-Red Kaweah, BK-Black Kaweah).
Arroyo, Junction Meadow and Bearpaw Meadow. There is no question of the need of these shelters on the part of the patrol men. The locations visited seemed suitable and free from wildlife objection; in most of them there is already a modest development such as fenced pasture, temporary shelter, or telephone station.

No. 147-301. Stream and Bank Protection - Kern River. It is stated in the project application (Jan. 15, 1936) that "floods during recent years have done inestimable damage in the Kern Canyon by obstructing old channels with gravel bars and log jams, cutting into meadows, valuable for pasture and filling deep holes once used as fish packs... The stream banks will be protected from further cutting."

The writer believes that the wording of the justification tends to create in the mind of the reader a picture of havoc of much greater extent than is actually the case. Of the three chief meadows involved, Upper Funston Meadow and Junction Meadow were studied, and the following comments are offered:

Upper Funston Meadow. This is a fenced tourist pasture comprising perhaps two acres of good feed (Fig. 10).

![Image of Upper Funston Meadow, showing good feed and little damage by flood conditions.](image-url)
The meadow is bordered on the east side by the Kern River, but relatively little of it has been affected by changes in the stream channel. At the lower end of the meadow the river has changed its course from time to time, but numerous willow thickets and clumps of other trees have tended to control the course of the water to such an extent that only a small part of the edge of the meadow has been eaten away (Fig. 11). A number of logs have been deposited at the extreme lower end of the meadow, but their presence hardly affects the use of the meadow for grazing purposes, at least at this time of year, because that end is too wet for stock and has not been used by the animals at all (Fig. 12).
Junction Meadow. This meadow is at the present time vastly inferior to Upper Funston as a source of feed but its inferiority in this respect if it can be attributed to the activity of the Kern River at all, must have been caused by the moving of the stream farther away from the meadow, for the latter is some distance from the waters edge, and is quite dry. The meadow is watered only by a small, sluggish branch streamlet, and is hardly more than a swampy place in the forest. Much of the area is covered by charred logs which represent former standing timber that fell and lay undisturbed — not logs drifted in from above by flood waters. Large parts of the meadow have resprounto to timber again, which was chopped down then the trees were about 5 inches in diameter, leaving the ground thickly dotted with the small stubs.

Due to this accumulation of down logs and stubs (Fig. 12) the area is not easy for stock to negotiate; however, the ground is too dry and sandy to support a luxuriant growth of feed under the best conditions. In the neighborhood of the sluggish streamlet referred to, the ground is damper but the feed remains inferior and consists largely of false heliobore or "skunk cabbage" (Veratrum sp.) and associated plants such as fuchseia.
Fig. 13. Junction Meadow, showing charred fallen logs, and numerous small stubs indicating extensive forest reproduction. The feed here is of an inferior type and very limited in amount.
It seems unlikely that this actually inferior meadow can ever be enlarged or improved to any great degree. Removal of some logs and possibly a limited amount of standing timber might be justified if it should become necessary to keep the meadow set aside exclusively for government stock used on patrol only, but for ordinary tourists use the meadow can never beadequate, so that extensive improvement next for the purpose is not to be recommended. In any event there is sufficient feed in other parts of Kern Canyon and in immediately adjacent regions to meet the needs of the tourist. We ourselves found lots of game without using either of the meadows mentioned.

On the basis of these observations it is recommended that very little be done to Upper Kearsage Meadow and Juntura Meadow on the basis of any improvement. On the basis of what is known improvement is possible that Supervisor of Fish Resources models will desire to make specific recommendations; but in this connection it is urged that any alteration of the river be proposed until he has had a chance to personally review the situation, in November.

With regard to Lower Kearsage Meadow, which was not visited, no specific recommendations are offered. The tourist meadow, a matter of a mile north of Kern Hot Springs, does not seem to have been disturbed by the river.

Secs. 1,3,4,11 and 1,3,4,12 Excepting Countryside - Kern River. These are directly related to the preceding project. They seem unnecessary extenstive and artificial for the preservation of the meadows described above; it is recommended that Mr. Barlow be given opportunity to judge their necessity as related to fish conservation.

Secs. 1,2,3 and 1,2,3,4 Lake and Pond Development. Not studied. In view of what was learned at the Sacramento conference in January regarding the difficulty of planning stream improvement projects which result in real benefit to fish it is desirable that all such work be postponed until Mr. Barlow can make specific suggestions on the ground. (This was provided for in the letter of March 12, 1929 from Assistant Director Burt to Superintendent White, and no work has been done to date). (* See also page 17b for information gained since the above report was written).*}

*Medallion Creek - Bighorn Plateau

General aspects. The climb out of the Upper Kern River valley follows a wooded trail and is quite steep. The end of the climb brings one to the top of the left, scenicly resembles Bighorn Plateau which extends over thousand of acres and meet at one time have been a prime feeding ground for the animals from which it derives its name.

Kiddville. Bighorns. Prior to the establishment of the park the Bighorn Plateau was heavily wooded and very likely the native inhabitants were driven out by a combination of hunting competition for food, and disease introduced by bands of tame sheep. At the present time there is abundant
Fig. 14. Bighorn Plateau looking north toward Diamond Mesa and the main Sierran Crest. Originally a prime bighorn territory, the area was heavily sheeared before Sequoia Park was established. The bighorn remnants have never recovered from the invasion. Note abundant feed in foreground.

Fig. 15. Bighorn Plateau, looking west to the Great Western Divide—the backbone, scenically as well as physiographically, of Sequoia National Park. Once this was all bighorn range (M - Milestone Mountain, RS - Red Spur, RK - Red Kaweah, BK - Black Kaweah, K - Kern Ridge)
* Since the foregoing comments were prepared it has been learned that Projects 147-301, 148-404 and 149-405 were intended for application primarily to Lower Funston Meadow (not visited), where erosion damage is said to be excessive. Therefore, it should be emphasized that the above comments on condition at Upper Funston and Junction Meadows do not apply to Lower Funston Meadow.

Projects 150-903 and 159-903 are being held in abeyance.
feed (Fig. 14), but the bighorn remnants have never recovered from the invasion of their exotic relatives.

Looking westward across the Bighorn Plateau the observer sees one of the most spectacular regions in the park - the Great Western Divide, which, scenically as well as physiographically, is the backbone of Sequoia (see Fig. 15, in which the wide angle lens fails to do justice). This mountain range also must have been a magnificent bighorn country, but now it is deserted. The main Sierra crest (Fig. 16) was another stronghold for bighorn, and it is here that the survivors still linger, as Mr. Dixon's investigations have shown.

Fig. 16. The barren crags of the Sierra crest, seen looking through Shepherd Pass to Owens Valley. Ninety miles farther, beyond two more ranges of increasingly forbidding desert mountains, lies Death Valley. This is the best bighorn country left in California.

Fish. The Kern River above Junction Meadow, and the tributary Tyndall Creek, both of which lie off the beaten track, are plentifully supplied with the Kern Rainbow (Salmo gilberti).
**Trail Conditions.** The trail from the Kern Valley to the Bighorn Plateau is not much used and is one of the old-fashioned kind that goes straight up without benefit of engineered gradients. Although more work to climb, the feeling of isolation is greater.

The trail down Shepherd Pass, just outside the park, is well constructed, but at the time of the trip the higher portions were buried deep in snow, making it necessary to zigzag down over a steep, very loose talus slope. The large pack outfit run by Mr. Robinson of Independence had improvised a trail there (after having been forced to turn back, with the loss of three miles from an attempted crossing farther north) at the time that it crossed the mountains to pick up the Sierra Club at Giant Forest, a week before our visit. With every downward step that we took the loose rock slid underfoot causing one of our green mules to stagger off the trail into a pile of boulders, where she nearly broke a leg and by her struggles started a small avalanche which for a moment threatened to come down on top of the entire party.

**Summary of Recommendations**

The following recommendations are submitted for consideration:

1. That garbage at camp sites including tin cans be burned after each meal instead of being buried. When the garbage and tin cans are merely buried they are likely to be dug up by bears which learn in this way, often for the first time, to become camp robbers. While perhaps not always easy to enforce in out-of-the-way tourist camping spots this precaution ought to save the CCC spike camps and other work crew camps from numerous unpleasant experiences.

2. That no fish be planted in the Kernah Basin Reserve, since this would upset the existing natural balance which is the chief reason for having the area set aside for study.

3. That no measures involving drastic change of the natural stream flow be taken at Upper Junction and Junction Meadow to improve pasturage, and that related measures for the improvement of fish environment be in accordance with suggestions to be made by Mr. Hadsen.

4. That no road shall ever be built into Kern Canyon or any other human development introduced there which would destroy the primitive atmosphere which now makes that area unique.
KINGS CANYON

It was the desire of the late George N. Wright that the writer become familiar with wildlife conditions in the proposed Kings Canyon National Park, and it was in accordance with this wish that a short trip was made last summer with the Sierra Club into the lower end of the canyon.

Since Kings Canyon lies directly between Yosemite and Sequoia, and is immediately adjacent to the latter, the present trip was routed so as to include a part of Kings Canyon which the writer had not visited previously.

Itinerary

The route was from Kearsarge Pass down Bubbs Creek to Kernwærers and thence up Copper Creek through Granite Pass to the Middle Fork of the Kings River. The original plan was to follow up the Middle Fork to Cartridge Creek and regain the John Muir Trail once more, but Le Conte Canyon and Muir Pass were still blocked by deep snow, so that the long, circuitous route through Teshipti Valley, Grove Valley, and Roll-For-Sure Pass had to be followed, resulting in several day's loss of time and numerous unforeseen minor mishaps.

Bubbs Creek Area

General Aspects. From Keearsarge Pass, on the Sierran Crest, one descends fairly gradually into the basin of the Keearsarge Lakes and Bullfrog Lake. This is a high, granite country of marvelous scenic beauty; thickly forested only on the bottoms of the valleys and gorges where the meager soil has slowly accumulated (Fig. 17).

The route down Bubbs Creek soon enters the forest zone, where it slopes downward more steeply, passing several small flower-studded meadows along the way. Finally, in the last mile it plunges downward 1,300 feet to the floor of Kings Canyon, accompanied by the roar of innumerable leaping cascades.

Wildlife. Ground Squirrel. Three young about 1/3 grown were seen at Charlotte Creek, and the species was present in small numbers from this point to the floor of Kings Canyon.

Rattlesnake. Plentiful along the Bubbs Creek trail in the vicinity of Charlotte Creek. They occupy the same territory as the ground squirrels and probably help prevent the latter from spreading; indeed it is possible that the frequently observed spread of ground squirrels into new areas, which is usually correlated with a considerable invasion of the area by man, has been promoted by the gradual extermination of rattlesnakes on the part of the human settlers.

Fish. Not nearly as abundant as in the upper Kern River, undoubtedly because of the larger number of people who pass up and down Bubbs Creek and
through the adjacent territory. So constantly does one meet people along the trails of this region that one finds it difficult to shake off the impression that a resort is not far off. Campers with tents and pack stock were present at Bullfrog Lake and at the upper end of Bubbs Creek; for this reason there was no feed available for our stock along the trail for a distance of about twenty miles.

**Trail Conditions.** The explanation of this state of relative human congestion lies in the presence of a good road from Independence to Onion Valley, which is only about three miles from Kearnsyge Pass. A packers' camp is located at Onion Valley and the adjacent meadow is thronged with the automobiles of visitors who come up for pack trips of two or three day's duration.

**Kings River Canyon**

The Kings River Canyon is a glaciated gorge similar to Yosemite Valley but not so spectacular in scenic detail. The walls are neither as high or as sheer, and the breadth of the canyon at the bottom is not so great (Fig. 13); more important still, most of the floor of the canyon lacks the moisture which has
produced Yosemite's lush meadow land; it is sandy and dry, and when disturbed it envelopes the visitor in a cloud of dust. The Kings River Canyon cannot hope to rival Yosemite on the basis of scenic values; its appeal has rested on its claim of being the last great wilderness area left in California.

Since last summer's visit, the historic Kenwayers, or what there was left of it, has burned down. Nothing remains now but the name on the U.S. G.S. sheet and a few old hot water boilers and scraps of iron, and these latter are being cleared away by the Forest Service. At the height of its development fifteen or more years ago the old Kenwayers homestead included, according to oldtimers, a hotel — of extreme small size and rustic simplicity, one would judge. A son of the original Kenwayer who pioneered the region is now a U.S. Forest Service employee in the district.

Wildlife. Rainbow trout are abundant in Copper Creek except in a zone 100 yards long where the main trail crosses the stream; in this zone no fish at all were seen.

Deer. Two does were seen July 25 at Kenwayers. Deer are common in this
vicinity, according to the observations of this year and last year.

**Trail Conditions.** The Rubbs Creek trail and the trail through Kings Canyon are well traveled and in good condition.

**Granite Basin Region**

**General Aspects.** The trail up Cooper Creek to Granite Basin and thence down Dougherty Creek to Simpson Meadow is infrequently used. It traverses a strikingly scenic country in which wilderness conditions have been very little upset. Leaving the floor of the Kings River Canyon, it winds steeply...

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**Fig. 19.** Granite Basin as seen from the north rim. This is a prime beauty spot and an unspoiled natural garden. The so-called "granite buck" is rather common in this basin.

and interminably upward through mixed chaparral and forest; from time to time a small wet meadow, cherish high with luxuriant grass, or a grove of quaking aspens, marks the presence of a streamlet tributary to Copper Creek,
and affords a brief rest from the long, hot climb.

Granite Basin is a great bowl of dazzling rock whose whiteness is relieved by acres of green meadow and numerous small lakes (Fig. 19). It is a fine refuge for grouse and deer by reason of its inaccessibility.

From Granite Pass the trail drops down into the lush Dougherty Meadow and from that point descends with increasing steepness through dense forest until, in a climax of zigzags, it reaches the floor of Middle Fork canyon.


Deer. A fine buck and several does seen on July 25 at Granite Basin, also numerous tracks.

Sierra Grouse. A family group seen at Granite Basin on the above mentioned date. One 3/4 grown youngster showed characteristic lack of sophistication by flying toward us when startled, so that it missed colliding with one of the mules by only a few inches.

Western Goshawk. At Dougherty Meadow on July 25, 1936, a very large accipiter flew hurriedly into a small fir tree under which I was standing. Immediately upon alighting, however, it saw me and hastily darted away. The brief glimpse which I got made me feel pretty sure that the bird was much too large to be a female cooper hawk; moreover the altitude (10,000 feet) at which the record was made is a further indication that the bird was not a cooper hawk but a goshawk. Although identification was not positive, the observation seems worth recording.

Fish. In the vicinity of Dougherty Meadow, both meadow grass and bunch grass feed is abundant. This abundance of vegetation is associated with an abundance of insect life, which in turn is conducive to an abundance of fish. Rainbow trout in Dougherty Creek were excessively abundant, doubtless for this reason together with the fact that Dougherty Creek lies off the beaten track.

Trail Conditions. Because it is little used, the Granite Pass trail is not kept up much, and has never been laid out on an engineered gradient. Nevertheless it is not difficult or dangerous if one does not try to make great speed, and its simplicity enhances the wilderness feeling.

The descent from Granite Pass to Dougherty Meadow shows rather severe erosion of a type which is common to these alpine regions. The moist, flower-bedded sod is easily cut and trampled by live stock, and due to the short growing season, together with the heavy precipitation, such scars tend to spread and deepen instead of healing (Fig. 20). The tendency of the stock to take short cuts down the zigzags serves to multiply the number of gullies. Erosion was also noted on this trail at lower elevations where the soil was markedly sandy and vegetation sparse.
Fig. 20. Gulleye formed at Granite Pass by stock trails. This type of damage is common in alpine regions, where the soil is easily scarred and slow to heal.

Fig. 21. Fallen log serving as a soil saving dam at the head of an incipient gulley — a lesson against extensive forest clean up.
In forested regions, on the other hand, fallen logs often serve as soil-saving dams which hold back excessive run-off and check incipient gulleys at their commencement. This process was clearly evident along the trail from Dougherty Meadow to Simpson Meadow (Fig. 21), and served to call to mind once more some of the dangers of excessive forest clean up.

Middle Fork of the Kings River

General Aspects. The proposed Kings Canyon National Park includes two main forks of the Kings River. The South Fork flows through what is known as the Kings River Canyon, as described above; it has received much more publicity than the Middle Fork and is commonly thought of as the heart of the Kings River wilderness area. Actually, the less well known Middle Fork canyon is fully as outstanding from a scenic point of view (Figs. 22-24), and will soon be, if indeed it has not been for a long time, a more primitive piece of wilderness than the better advertised Kings River Canyon.

Fig. 22. Typical view of the Middle Fork Gorge, north wall, as seen from the zigzags on the Dougherty Creek trail. The central mass is thought to be Mt. Woodworth. The floor of the canyon lies some 2500 feet below the bench from which this picture was taken.

Like the Kings River Canyon, the Middle Fork Canyon is a long, narrow glaciated gorge, fed by a series of plunging cascades which unite to form a broad, swift-flowing river. It is less ugly, and quite as scenic, if not more so (Fig. 23); the celebrated Tehapiite Dome, which rises like a gargantuan tombstone 3413 feet above the canyon floor recalls the more striking aspects of
Fig. 23. A typical portion of the Middle Fork canyon view from the junction of Dougarty Creek trail and main canyon trail, looking east. Note how the presence of occasional dead trees contributes to the wilderness atmosphere.
Yosemite Valley (Fig. 24). Above all there is an atmosphere of the truly primitive about this canyon which the more exploited Kings River Canyon cannot help losing when the road is completed. Various U.S. Forest Service representatives, both during the trip and at subsequent meetings, have stated that the Middle Fork canyon will be protected from future development as part of the huge "Sierra Nevada Primitive Area" which has been set aside to preserve wilderness conditions.

The maintenance of the canyon intact will at least be made easier by the fact that at the mouth of the gorge the narrow walls rise nearly straight up for more than 3000 feet, imposing an almost insuperable obstacle to road building; in fact it has not been possible to push through even a feet trail, and one is cut off from all direct communication with the adjacent Kings River Canyon and the General Grant Country. According to the local old-timers, only two men have succeeded in getting through this gorge, and they were prospectors whose grub supply ran out during the winter forcing them to make the attempt. That they were able to get through was due to the fact that the country was buried in snow and ice, with the river at its seasonal low point.

Fig. 24. The Middle Fork canyon as seen from the highway out of Teniente Valley, looking east; the celebrated Teniente Dome is seen on the left. This is truly the heart of the Kings Canyon wilderness region.

At the time of our visit the John Muir Trail from Cartridge Creek to Grouse
* Superintendent Guy Hopping of General Grant National Park has since informed the writer that one or two other persons have succeeded in passing through the gorge.
Meadow was practically impassable, and Mair Pass was completely blocked by snow. A Forest Service man was working on the trail, but had not yet been able to accomplish much; one party had tried to make the crossing a few days previous, but had been forced to turn back.

The blocking of Mair Pass left the long, exceedingly circuitous route through Tehapi Valley, Crown Valley and Hell-For-Sure Pass as the only other available route through the high country. The way led over various obscure, seldom used trails which received little or no annual maintenance, so that the time consumed was far beyond what had been anticipated.

Wildlife. Ground Squirrels. A few at Simpson Meadow and in adjacent territory, but not many. The absence of abnormal numbers of ground squirrels furnishes a good gauge of the primitiveness of regions like this. For example, there is hardly any doubt that ground squirrels will greatly increase in the Kings River Canyon when the road is completed and the natural enemies of the ground squirrels are driven away.

Bear. Present, but have not had an opportunity to become garbage feeders; therefore they are still wild and do not molest the few camps which are present.

Martin. Fairly common, according to "old-timer" Blodgett, of Visalia, who has spent the last 5 summers in this region (he knew the late Walter Starr, who wrote the "Guide to the John Muir Trail and the High Sierra Region"; he also knows Norman Clyde and other mountaineers of prominence, and probably represents a good cross section of local opinion concerning the administration of the region and its development.

Wolverine. Blodgett said that he had never seen one alive, but that their tracks may be seen frequently in the vicinity of Woods Creek.

Fish. Said to be exceptionally abundant in the Middle Fork and tributaries.

Trail Conditions. The trail which follows the Middle Fork down the canyon is decidedly primitive (Fig. 25). One section, known as Hells Half Acre, threads its difficult way across the base of a wide talus slope covered with giant boulders; in some places, where the boulders are too big to get around, one is forced into the river for short stretches. This granite country wears out horse shoes at a terrific rate and if a shoe is pulled off, the hoof wears down to the quick in a few hours.

The zigzags up out of Tehapi Valley rise about 3400 feet in two miles, and are quite the most viciously steep zigzags that the writer has ever encountered. By the trailside were the bones of some horse that had failed to make the grade; one of ours was staggering pretty badly before the climb was finished.
Administrative Problems. No criticism of the administration is intended by the above observations as to trail conditions, which are given here as a matter of record for comparison with future conditions; as explained by District Ranger Jim Poe, very little money is available for trail maintenance in the more out of the way sections.

Certainly this primitive type of trail does not do violence to the wilderness values as would a rocked up engineered trail of excessive width. Probably a middle course between these two extremes is possible, but if not, then the present un "improved" type would seem preferable in this intentionally maintained primitive area. If one does not insist upon traveling fast there is little danger on this type of trail - certainly much less than is present when one attempts to cross a paved automobile highway.

It was found that there is a certain amount of feeling among local campers and oldtimers against the establishment of a Kings Canyon National Park because:

(1) it is felt that the National Park Service would promote extensive building construction by public utility operators, build elaborate trail systems and bring in great crowds of people,

(2) hunting would be forbidden

(3) household pets, particularly dogs, could not be brought in to spend the vacation with the family, as is now permissible (in the various discussions which took place the writer considered it advisable to preserve complete anonymity and to utter no expressions of opinion; this anonymity was maintained from the time So no. was left until the Devils Postpile was reached).
SIERRA NATIONAL FOREST

Itinerary

From the Middle Fork of the Kings River the route paralleled the Green Creek drainage, passing Hay Meadow, Dry Meadow, and Johnson's Cow Camp. From Johnson's Cow Camp the trail crossed Scepter Pass, the Devils Punch Bowl, Hell-For-Sure Pass, and entered Goddard Canyon, where it joined the John Muir Trail as the latter descended from the snow bound alpine country. A detour was made to Blaney Meadows and Mono Hot Spring (at Florence Lake) for supplies, and the John Muir Trail was reached again by the way of Vermilion Valley, from which point it was followed the remainder of the way to Devils Postpile and Yosemite National Park.

Crow Valley and Black cap Basin

General Aspects. After climbing out of the Middle Fork canyon the way leads through long stretches of only moderately precipitous Canadian zone country characterized by miles of heavily forested slopes, numerous small, shallow grassy valleys, and occasional bare granite ridges and glacial cirques. The most outstanding feature of the country was the difficulty, regarding which we had been warned previously, of locating the main trail. The region is grazed by cattle and sheep, and their well-worn trails, some of which have been blazed, together with a general scarcity of trail signs, caused us to make several unintentional detours.

Wildlife. Deer. Quite numerous in the vicinity of Johnson's Cow Camp, which is also gradually becoming a dude ranch, although no road leads to it as yet.

Trail Conditions. Scepter Pass is apparently quite unused and the trail is now hardly more than a game trail down over the rocks. What little travel there is in this country follows an alternative trail (not named on Walter Starr's map) to the west. The blazed trail into Black cap Basin ends in a box canyon and was taken by a mistake arising from the lack of signs together with sheep trails.

Administrative Problems. Grazing. The minimum of damage by live stock was observed throughout this whole forest district, doubtless because the range is not overstocked. The wet meadows are trampled and cut by cattle to some extent, but the stock is well scattered and forms relatively few clearly marked trails. Even the sheeped areas showed little damage, and there was still enough feed for our stock in some of the box canyons. Possibly feed conditions were better than normal at the time this visit was made, for, as noted below, under weather, this has been an unusually wet summer.

Hell-For-Sure Pass and South Fork of San Joaquin

General Aspects. From Black cap Basin one rises gradually to Bench Valley
and the Devils Punch bowl. The dense forest drops behind and again the country becomes predominantly granite, with an alpine meadow or a barren glacial tarn in each rocky basin. Hell-For-Sure Pass marks the climax of a tortuous clambering over the rocks; although not as lofty as many passes, the grim desolation of the scene (Fig. 26) together with the almost ladder-like ascent over slippery boulders justifies its name.

From Hell-For-Sure Pass the trail drops rapidly into the deep, narrow Godderd Canyon, down which the South Fork of the San Joaquin flows for about a dozen miles until it enters the artificial Florence Lake, which is a resort country.

Fig. 26. Barren alpine country as seen looking west from halfway up Hell-For-Sure Pass. There are few zigzags on this trail, as it goes almost straight up over the boulders. A broken pack saddle and some bones told of one horse that failed to make it.

Trail Conditions. From Bench Valley the trail leads to the Devils Punch Bowl, which is a glacial basin over whose narrow rim the snow-fed lake spills into a small valley about two hundred feet below. The trail leads out across this rim, which is only about 20 feet wide, and it is necessary to make the stock through the overflow from the lake. Although perfectly safe at the time of our crossing the rock ledge which forms the rim is smooth and slopes slightly so that at times of high water it is dangerous to make the crossing. One party had three horses washed over the rim a year or so ago, and the total number of stock lost to date is 45 according to Mr. Johnson, at Johnson's Cow Camp.
The Hell-For-Sure Pass trail is not much used and maintenance work must be still less frequent. The ascent over the boulders is so steep in places that one must be careful to keep the stock well spaced out, otherwise a slip on part of one animal might throw the next one below over backwards off the trail. A broken pack saddle tree and some old bones told of one horse that fell down to rise no more.

The loose rock on these mountain trails (Fig. 27) will often wear out a set of horse shoes in one week, besides pulling many off. After we had used up all our spare horse shoes we used the many cast-off shoes stream along the trails, cutting the big ones down with a cold chisel and shaping them over a boulder. The zero hour of the trip came one late afternoon near Hell-For-Sure Pass in a pouring rain when we found ourselves on the wrong trail, with all the stock partly barefooted and too sore to go on without shoes except one horse, thirty miles of rocky trail between us and the nearest known habitation, and our supply of horse shoe nails exhausted. Luckily some nails were discovered at a nearby sheep camp.

The trail down Goddard Canyon is much more heavily traveled than the Hell-
For-Sure Pass trail; two parties, one with seven and the other with 9 head of stock were passed, as well as two other parties with tents. A University of California geology student stated that still another party had been camped for two weeks waiting to get through Muir Pass; someone else had lost all their grab and outfit fording the San Joaquin River which was greatly swollen by the continuous rains.

The trail crosses the San Joaquin three times in about six miles. At least one of these crossings was formerly provided with a suspension bridge, but at the present time it is necessary to ford them all. The water came well above our horses' bellies and was quite rough, but none of the animals was forced to swim.

These conditions affecting mountain travel are mentioned for their possible value in throwing light on National Park Service trail conditions.

Florence Lake - Vermilion Valley Region.

General Aspects. From Fresno an automobile highway was built far in to the heart of the Sierra so that dams could be built at Huntington Lake and Florence Lake. The road is heavily used and the surrounding area has become a popular resort with facilities for camping, boating, and packing (Gasner's Pack Outfit).

Vermilion Valley to Devils Postpile

General Aspects. From the populous Mono Hot Spring the trail climbs slowly through typical Canadian zone woodland and meadows until the forest drops behind at Silver Pass, where the snow banks linger well into the summer. From this point one drops down again into the forest, which continues with unbroken regularity to the Devils Postpile.

Wildlife. Rainbow trout were very abundant in Cascade Creek. This is just far enough north of Mono Hot Spring and south of Reds Meadow so that it is reached by few fishermen.

Trail Conditions. The John Muir Trail is practically a highway compared with the seldom used trails over which we had previously traveled; it is, of course, a main artery of mountain travel and is well kept up throughout most of its length.
DEVILS POSTPILE AND VICINITY

Itinerary

From the Devils Postpile a detour was inadvertently made into the Minaret Creek basin owing to the partial obliteration of the old trail, now abandoned, to Shadow Lake and the lack of signs. From Shadow Lake the route ran by way of Thousand Island Lake, Island Pass and Donohue Pass to Yosemite.

Nade Meadow and Devils Postpile

Nade Meadow and Devils Postpile lie in a long, rather narrow valley, at an average elevation of about 7500 feet. Each of the valley is forested like the surrounding ridges but there are numerous wet meadows and an occasional sandy flat. A good road connects the area with the main Owens Valley Highway, so that this mountain region is frequented by hordes of visitors. A large Forest Service camp ground, together with a bath house and a store are present and heavily used.

The Devil's Postpile is on 850 acre tract of forest land immediately adjacent to Nade Meadow and the Middle Fork of the San Joaquin River. Its jumbled piles of post-like basaltic columns have given it its name, and constitute its chief distinction. Its trails are broad and well used, and since the area is one of considerable human concentration, it probably serves its most useful purpose as a kind of outdoor museum.

Trail Conditions. The main trails are side, easy, engineered pathways.

The Minarets, Banner Peak, and Vicinity

General Account. From Nade Meadow the maps show two trails which diverge northward, and after running parallel to each other for about 6 miles, converge again at Shadow Lake.

The west fork of this route is now practically abandoned and was unfamiliar to local residents when mentioned; it was so obscure that we lost it in a woody jungle of down timber and inadvertently followed an abandoned mining road instead. The old mining road traverses the upper Minaret Creek basin, dotted with numerous small lakes, and affords many a gorgeous glimpse of the glacier draped Minarets which tower over the valley like gigantic cathedral spires (Fig. 28). At little under 10,000 feet the forest dwindles away, and one comes upon the abandoned Minaret Mine. Six years ago the region must have presented a scene of noisy, populous activity, but now the wilderness is slowly reclaiming the place. The only sounds are the murmuring of the wind in the pines and the soft roar of the snow fed streamlet — sounds which only serve to intensify the vast quiet silence.

Leaving the deserted mine, an almost invisible trail threads the alpine meadows and then abruptly ascends to the crest of Volcanic Ridge where the old Alamo claim is located (altitude 11,000). From the abrupt escarpment of Volcanic Ridge the view is breath-taking in the extreme. To the south and east lies a tumultuous sea of snowy crests, most of them lying within the once Sierra National Forest 'Primitive Area'. On the west one is confronted by the jagged wall of Mt. Ritter, Banner Peak (Fig. 290) and the Minarets — gigantic monuments
Fig. 28. Glimpse of the needle pointed Minarets as seen from the abandoned Minaret Mine road. The wide angle lens fails to do justice to these spire like creags.

Fig. 29. Mt. Ritter (left) and Banner Peak (right) as seen from Volcanic Ridge. The wilderness atmosphere is unspoiled.
whose frozen breath, sweeping across snow which never melt, seems to have congealed the flow of time itself. To the north one looks out over empty space; the rocky ledge drops away almost under foot to Shadow Lake lying far below where the John Muir trail shows as a narrow ribbon, only a mile distant as an eagle might make it, but nearer twelve for plodding mankind. This part of the Sierra, although not more wild than many others, was certainly the most magnificent covered by the present trip, from a scenic point of view. The feeling of awe and reverence which this region engenders would be shattered by the intrusion of any artificial human structure; to build anything in such a priceless place would be nothing short of sacrilege. With buildings and highways practically everywhere else in California, there should be no question as to the necessity of really protecting occasional wilderness fragments such as this from the advancing tide of "improvement". At present the area lies just outside the U.S. Forest Service "Primitive Area", and about 5 miles from the east boundary of Yosemite.

Since it was impossible to descend Volcanic Ridge with stock, the west fork of the trail to Shadow Lake had to be retraced as far as Reds Meadow, and the well traveled east fork followed instead. The latter route traverses a long, narrow partly wooded valley down which flows a branch of the infant San Joaquin River, then it climbs abruptly a stair-like formation past thundering waterfalls and brings the mirror-like surface of Shadow Lake suddenly into view. From Shadow Lake the way lies through alpine meadows, past Garnet and Thousand Island Lakes, overhung by frowning mountains, then through the low Island Pass (sinclastic life zone) and into the Rush Creek basin which is characterized by extensive Canadian zone forests and numerous meadows. Even in August the nights are decidedly cold, the temperature probably falling to 40°F or even lower. Thousand Island Lake is considered an impossible camp site by local people because of the cold winds which sweep down from the glaciers; although feed is plentiful, stock refuse to stay there if turned loose (Fig. 30).

**Wildlife**. California Gull (*Larus californicus*). On August 5, a large white bird which could hardly have belonged to any other species was seen from Volcanic Ridge as a tiny speck sailing low over Shadow Lake. Since the California Gull has been recorded as breeding at Mono Lake, which is only about 20 miles distant, air line, this observation is not as unusual as it might seem at first.

**Trail Conditions**. The obscenity of the old west fork trail from Reds Meadow to Shadow Lake has already been mentioned; it is blocked in scores of places by tangled masses of prostrate trees blown down by winter storms. On the calm motorless morning when the writer was riding along this trail a little behind the pack stock, something suddenly whissled through the air in a great arc and struck the earth with a resounding report. On reaching the spot it was found that a dead tree had just crashed down across the trail between the writer's horse and the rest of the stock in front; if those in front had been traveling a little slower at this point on the trail, or if the writer had traveled a little faster, the result would have been most unlucky for someone.

The east fork of the trail to Shadow Lake coincides in part with the John Muir trail, and is by comparison with the west side, a boulevard. At Geyser Lake the
trail was temporarily lost owing to the fact that there are few signs in the region; under such circumstances, however, a mountain man can usually find the trail again without retracing his route even though he is a stranger in the country, if a good map is available, or if the topography is sufficiently varied so that among the various possible routes certain ones obviously are more logical than others.

Although no live stock is grazed in the meadows of this region, the John Muir trail, in common with various other trails, is traveled so frequently that the short, velvety alpine grass is continually cut and gashed, and because of the very short growing season, has little chance to heal. This condition leads to the formation of unsightly gullies which may prove difficult to eradicate (Fig. 31).

The Donohue Pass trail into Yosemite had only been open a short time and the section east of the pass was especially tough for stock. The last mile to the top traverses a barren glaciated slope so thickly strewn with granite blocks as to be more adapted to travel by goats than by horses; in crossing it some care was necessary to avoid breaking legs.
Fig. 31. Gully formation caused by heavy travel on the John Muir Trail, near Garnet Lake. The picture fails to show adequately the brilliant red blossoms of *Castilleja* which dot the green carpet in great profusion.
YOSEMITE NATIONAL PARK

Itinerary

From Donohue Pass the route was to Tuolumne Meadows, followed by a side trip to the floor of Yosemite Valley via the Tenaya Lake trail, and return. From Tuolumne Meadows the trail down the Muir Gorge was followed to Pate Valley, thence via Rancheria Mountain to Hetch Hetchy and Lake Eleanor Reservoirs, at which point the park boundary was crossed and the return to San Francisco headquarters made by bus.

Lyell Canyon and Tuolumne Meadows

General Aspects. Lyell Canyon is a high-walled spacious valley, some nine miles long; its nearly level floor is largely meadow land dotted with numerous clumps of conifers which give it a fine park-like aspect; the Lyell Fork of the Tuolumne River flows down the middle of the valley. Tuolumne Meadows represents the same sort of country on an even more lavish scale (Fig. 32); the almost level floor of this high river valley (alt. about 8700 ft) approaches a mile in width at some points, and its fertile soil supports a luxuriant growth of grass and associated vegetation.

The Lyell Canyon trail is traveled by crowds of people and the forage in the canyon is grazed to a limited extent. Tuolumne Meadows is traversed by the Tuolumne Pass automobile road, which handles a steady stream of traffic. There are several lodges and stores, a gas station, postoffice, numerous campgrounds, and a large number of other buildings adjacent to the meadow areas, which is also rather extensively grazed. The whole region is heavily used by a large human population (Figs. 33-36) so that no atmosphere of primitive wilderness can be expected.

Wildlife. Needle miners and other insect enemies of conifers. Along the south side of Tuolumne Meadow needle miners (and possibly bark borers also) have killed 50% of the trees on the hill slopes (Fig. 33); the slopes on the north side of the meadow are similarly affected. This epidemic started around 1916, I was informed, and seems now to be a matter of historic rather than practical interest as far as preventative measures are concerned. The dead forest still stands, but the new growth is very dense and vigorous and has attained a height of 10 feet or more (Fig. 34). Although perhaps not esthetically appealing to persons unused to the sight of so much dead timber, it cannot be said that the forest is in any danger of extinction; on the other hand the countless dead snags provide shelter for many wild creatures. The fire hazard is unquestionably great.

Rainbow trout were noted as quite abundant in the Lyell Fork of the Tuolumne River; however, they are said to be difficult to catch because constantly pursued by large numbers of fishermen.

Administrative Problems. The building of roads and through park areas presents problems which chiefly concern various technical branches other than the Wildlife Division. Aside from the comparatively rare direct injury to plant
Fig. 32. Tuolumne Meadow as seen from the Tioga Road during a heavy rain.

Fig. 3. Hill slopes on south side of Tuolumne Meadow, as seen from John Muir. More than fifty percent of the trees were killed in former years by insect attack, but reproduction of young growth is heavy. Dotted lines indicate major areas of dead timber.
and animal life, the only other aspect of road construction requiring comment is its effect on the primitive picture. The construction of a road often involves a much greater disturbance of the original environment than is implied by just a narrow line drawn on a map, and it must often be difficult for those who have to make final decisions on road questions from a distance to picture the total amount of disturbance necessarily involved in addition to merely laying out a road bed through the country.

The construction of the new Tioga Road is mentioned here not with any thought of criticizing the manner in which the project, once it had been decided upon, has been handled, but because it illustrates the complex, irrevocable, and perhaps partly unforeseen chain of disturbances which is set up as soon as an elaborate highway of this type (Fig. 35) is authorized. The same line of thought applies even more forcibly in the case of the Hetch Hetchy dam construction project mentioned below.

At the junction of the new and old Tioga roads a dredge is removing huge quantities of rock and sand from the Tuolumne River (Figs. 36, 37). The material is crushed and sifted (Fig. 38) and deposited in an enormous storage pile (not photographed) at the edge of the forest (the river is considerably narrowed by these operations, but seemingly not enough to injure fish life). (Continue on p. 43)

Fig. 34. Forest killed by insect attack during the outbreak which started about 1916; view taken from the old Tioga Road (new road will be a broad, paved highway) near Tuolumne Meadows. It will be noted that reproduction is vigorous and extensive so that the forest cannot be said to be in danger of extinction.
Fig. 35. New Tioga Road where it crosses Tuolumne Meadows on a long, high fill.

Fig. 36. Machinery used to dredge up, crush and sift gravel obtained from the Tuolumne River; the finished product is used in constructing the adjacent Tioga Road.
Fig. 37. Closer view of operations shown in Fig. 36. Rock and gravel dug out of the river.

Fig. 38. Closer view of operations shown in Fig. 36. Rock and gravel dug out of the river is separated here.

Of course most of the disfiguring machinery and structures used in the road building will be removed when operations are completed, but some of the scars will be slow to heal, and others cannot but remain permanently. The road and its appurtenances are symbolic of the permanent change from the primitive Tuolumne Meadows of fifteen years ago to the mechanized sophistication of modern times.
Fig. 39. Forest along the Tenaya Lake trail which was damaged by insect attack at an earlier period. Reproduction is now very heavy and dense.

Fig. 40. Trail in vicinity of Mirror Lake, floor of Yosemite Valley.
Tenaya Lake Trail

Wildlife Aspects. Insect damage to trees. As in the case of the Tuolumne Meadows region, part of the forest along the Tenaya Lake trail suffered heavy loss from insect attack at one time. However, reproduction is now very vigorous and dense (Fig. 39).

Muir Gorge and Grand Canyon of the Tuolumne

General Aspects. Muir Gorge and Grand Canyon of the Tuolumne comprise another of those narrow, glaciated gorges with which this region abounds (Fig. 41). From the populous Tuolumne Meadows one descends slightly to Glen Aulin, which is a tent cabin resort; thereafter the canyon walls close in and the trail drops rapidly to the bottom of Muir Gorge, passing a number of attractive waterfalls on route.

Fig. 41. Muir Gorge — a region of attractive waterfalls and swirling pools heavily patronized by hikers and fishermen.
The canyon is heavily traveled as far down as Watersheel Falls by hikers of both sexes and all ages, and by fishermen. Below Watersheel Falls the number of day hikers decreases, but campers with tents are still in evidence. To any point in the canyon it is only a day's short trip either from Tuolumne Meadows or White Wolf.

**Wildlife.** Rainbow trout were observed to be very numerous in the Tuolumne River below Watersheel Falls.

**Trail Conditions.** All the trails encountered in Yosemite during this trip were carefully engineered exceptionally safe and well maintained. The exotic Downy Brome Grass (*Bromus tectorum*) is present in many places along the trail in the Grand Canyon of the Tuolumne. Probably it was introduced with feed brought in for pack and saddle stock.

**Rancheria Mountain**

**General Aspects.** At Pate Valley the trail leaves the Grand Canyon of the Tuolumne, climbs 4,000 feet to the top of Rancheria Mountain, then descends into the canyon again in the vicinity of the Metch Metchey Reservoir. Rancheria Mountain is a roughly triangular, forested plateau with an average elevation of less than 8,000 feet. Extensive meadows and bunch grass flats (Fig. 42) and an abundance of water made this area, together with the adjacent Pleasant Valley, a good grazing country in former days; hence its name. There is nothing spectacular about the region, but the absence of heavy travel and the freedom from a multiplicity of human structures have resulted in the preservation of much primitive charm.

**Wildlife.** Bear. A dropping composed almost entirely of manzanita berries was observed on the trail near Pate Valley on August 10. On August 11 a very fat brown yearling cub was encountered on the trail to Pleasant Valley. It turned off the trail with manifest reluctance and showed very little fear.

**Ground Squirrel.** One seen on Rancheria Mountain August 12, 1936 the first in many days.

**Lake Fauna.** Most of the lakes encountered in the Sierra Nevada were comparatively barren of plant and animal life, and many were situated at such high altitudes as to be completely lifeless, at least as regards visible forms. Table Lake, near Pleasant Valley, is a marked exception (Fig. 42). Evidently its lily-pad-covered waters presents an unusually favorable combination of prolonged moderate temperature and various chemical constituents which promote plant growth. The plants, in turn support a large insect population, which constitutes a food supply for numerous vertebrates. Unfortunately there was not time to study the animal life of the lake. Ranger Patterson, stationed at Miguel Meadow, states that there were several similar lakes in the region.

**Trail Conditions.** Portions of the Rancheria Trail are relatively little developed or formalized, although everywhere entirely adequate even for heavy use. Contrasting with this simplicity, however, most of the trail has been developed beyond what would seem necessary for safety or the requirements of
Fig. 42. Table Lake, near Pleasant Valley. Such luxuriant plant growth is unusual in the lakes of the Sierra Nevada.

maintenance. In Section 16, where the slope is very moderate, the trail is 4 feet wide, with roadbed up embankment (Fig. 43); farther up, on the level plateau itself, the trail is not marked by the usual inconspicuous blazes but instead is lined for long distances with parallel rows of small boulders, reminiscent of the rows of stones commonly used to mark the paths in backyard gardens (Fig. 44).

Rancheria Mountain lies just out of range of the commercialized Hatch Hatchy area (see below) on the west, and just beyond the heavily used Grand Canyon of the Tule Lake, Glen Aulin, and Tule Lake Meadow on the east; the Rancheria Mountain region is infrequently traveled, and presents the closest approximation of wilderness atmosphere encountered in the park during the trip; the lines of stones along the trail interject a note of studied artificiality into an otherwise attractive picture, and are all the more functionally unnecessary.

Hetch Hetchy, Miguel Meadow and Lake Eleanor

General Aspects. Hetch Hetchy Valley represents the climaxial lower end of the Grand Canyon of the Tule Lake. Its narrow floor and glacier-polished walls remind one forcibly of the Kings River Canyon. Originally, Hetch Hetchy Valley must have been even more attractive than the Kings Canyon, however, because the floor of the former was covered with a meadow of great luxuriance.

When the City of San Francisco won its long fight to appropriate Hetch Hetchy for its own use, the wilderness was necessarily ruined, as the opponents of the project had foreseen. The trees were chopped down and cleared from the floor of the valley; then, following the construction of the dam, the meadow was submerged (Fig. 45).
Fig. 43. Rancheria Trail in Section 6, showing trend 4 feet wide, and rock bar embankment.

Fig. 44. Rancheria Trail on the mountain top. These rows of stones are unnecessary as trail markers and interject a note of studied artificiality into an otherwise primitive scene.
Fig. 45. Hatch-Hatchy Reservoir as seen from opposite Kolama Rock. The dotted line indicates a previous water level; when the present construction is completed, the level will be 25 feet higher yet. X- Kolama Rock; D= O'Neaghmassey Dam E- excavation in side of mountain to obtain rock for concrete work.
At the present time the dam is being raised an additional 35 feet, which, it is said, will back the water up nearly to Pate Valley. Evidences of engineering skill are to be seen everywhere; rock for cement work is being blasted from the side of the mountain (Fig. 45) and picked up with a power shovel; the adjacent slopes are criss-crossed with roads for the trucks, and a 700 foot tunnel has been built to permit passage of one of these roads through a solid rock shoulder. The scene is one of great activity; motor boats cross from one shore to the other, a gigantic tramway, supported on steel towers, extends through the forest to Miguel Meadow, several miles away, and conducts a ceaseless stream of raw materials to the dam site (Fig. 46); the roar of operations can be heard for miles.

Fig. 46. Vicinity of O'Shaughnessy Dam, showing roads (R), tunnel (T), motor boat (M) one of the steel towers supporting the tramway (S), the tramline (L), and other developments. D — the dam itself, which is being raised an additional 35 feet.

Miguel Meadow was once a fine large meadow near the center of a densely forested plateau; its rather dry, sandy soil supported a luxuriant stand of forage (Fig. 47) of a type much superior to that found on wet meadows. At the present time this meadow is being dug up by power shovels (Fig. 46) to furnish sand for the O'Shaughnessy Dam addition.

The sand is hauled by trucks to the end of the meadow where it is loaded onto a gigantic cable tramway with buckets spaced 650 feet apart, by means of which it is conducted to the dam site 1800 feet lower and 3 miles distant in an air line (we were told that the tramway was 10 miles long, but this does not appear to be corroborative by the map). The entire meadow will be extirpated by this project,
Fig. 47. Miguel Meadow just prior to annihilation. The entire area is to be dug up to furnish sand for the O'Shaughnessy Dam; the resulting hole will be flooded so as to make an artificial lake. Shows ramp for trucks at end of meadow.

Fig. 48. Closer view of the destruction of Miguel Meadow.
and the resulting hole is to be flooded with water to form an artificial lake so as to conceal the scar.

Lake Eleanor is another artificial reservoir with widely fluctuating water levels; however, unlike Hetch Hetchy, a portion of the present body of water was originally a natural lake. The dam, the caretaker's house and associated buildings, a road, and a work camp have obliterated any wilderness values.

**Wildlife.** Fish. Lake Eleanor is an important egg taking station. The water level falls about 25 feet during the summer, but the original sump retains enough water to enable the fish to survive.

At the Hetch Hetchy Reservoir, also, old waterlines visible on the canyon walls above the present water surface, together with the presence of a zone devoid of vegetation, indicate that the water level fluctuates at least twenty five feet. Such extreme fluctuations prevent the establishment of any important aquatic food plants, as pointed out by Dr. Richard M. Bond in a wildlife memorandum dated November 12, 1935.

**Trail Conditions.** The writer was told that original contract bids for the construction of the O'Shaughnessy Dam called for the building of a four foot wide, oiled trail all the way around the reservoir at the high water line.

**Administrative Problems.** The drastic alteration of natural conditions which has taken place in this region has profoundly disturbed many forms of wildlife. From a broader viewpoint, however, the accompanying destruction of wilderness values is much more serious, and this consideration alone would fully justify the determined opposition which the Service has offered to the exploitation of the area. Probably the endlessly ramifying consequences of huge projects such as this are not clearly seen by those who have to make final decisions on them from remote headquarters. Who could foresee the full extent of wilderness destruction, including all the roads, trails, tunnels, maintenance stations, tramways, stock piles, borrow pits, mountainside scars, power lines, abandoned camps, and meadow obliterations, implicit in the drawing of a tiny segment of line, representing a dam, across this canyon?

Although the destruction of Miguel Meadow will be concealed by flooding the hole with water — which is doubtless the best choice of expedients — of course this circumstance can not be used as an argument in favor of the Hetch Hetchy project, since the purpose behind the establishment of the park was to preserve natural conditions and this perquisite is not met by artificially rearranging the scenery to make a pretty picture. Perhaps the sacrifice of this area in Yosemite may help prevent other raids on the national parks such as the threatened construction of a tunnel through Rocky Mountain National Park.
Although the annual climatic cycle throughout most of California is characterized by cool rainy winters alternating with hot, dry summers, the climate of various large mountain masses rising above 8000 feet constitutes an exception to this rule. To higher portions of Sierra Nevada, in particular, are subject to frequent summer thunderstorms which exert a pronounced effect upon the vegetation and thus secondarily upon the associated wildlife.

All residents and habitual visitors whom we encountered in the mountains agreed that the rains have been heavier and more prolonged than usual this summer, and that forage conditions are the best in at least ten years. Certainly feed was abundant nearly everywhere, and was by no means used up even in the vicinity of the sheep camps. Perhaps this very abundance, however, has resulted in an unduly favorable impression as to the effects of grazing in the region.

Rain fell during 16 of the 28 days spent by the writer in the high country. Usually the sky would be somewhat overcast in the morning but with no actual rain, then shortly after lunch the air would become noticeably colder and rain would commence to fall, often coming down very hard for three or four hours to the accompaniment of a prodigious crashing and rumbling of thunder among the mist encircled crags. Toward evening the downpour would subside, and during the night little or none would fall, which was decidedly convenient.

These recurrent afternoon showers kept the porous, mountain soil reeking like a sponge, so that the high meadows were still covered with flowers and green grass, whereas usually by that time of year the feed commences to dry up.

FORAGE CONDITIONS

A summary of forage conditions observed on this trip is given herewith:

| TRAIL | LOCATION OF FORAGE | TYPE OF FORAGE | QUALITY | AMOUNT | FENCED
|-------|-------------------|----------------|---------|--------|--------|
| Middle Fork of Kaweah River | Little Bearpaw Meadow  
(Other localities in this vicinity said to be good, but not visited) | wet meadow | good | 2 or 3 acres | Present |
<p>| Big Arroyo to Upper Funston Meadow | Big Arroyo almost throughout; Sky Parlor Meadow and elsewhere on Chagoosa Plateau | bunchgrass and wet meadow | fine | unlimited | Present in Big Arroyo |</p>
<table>
<thead>
<tr>
<th>Trail</th>
<th>Location of Forage</th>
<th>Type of Forage</th>
<th>Quality</th>
<th>Amount</th>
<th>Fenced Pasture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kern Canyon from Upper Funston Meadow</td>
<td>Upper Funston Meadow</td>
<td>wet meadow</td>
<td>good</td>
<td>about 10 acres</td>
<td>Present</td>
</tr>
<tr>
<td>Kern Hot Spring</td>
<td>wet meadow</td>
<td></td>
<td>fair</td>
<td>2 or 3 acres</td>
<td>Present</td>
</tr>
<tr>
<td>Kern Canyon between Kern Hot Spring and Junction Meadow</td>
<td>bunchgrass</td>
<td></td>
<td>good</td>
<td>2 or 3 acres</td>
<td>Present</td>
</tr>
<tr>
<td>Junction Meadow</td>
<td>wet meadow</td>
<td></td>
<td>poor</td>
<td>1 or 2 acres</td>
<td>none</td>
</tr>
<tr>
<td>Junction of Tyndall Creek and Kern River</td>
<td>bunchgrass</td>
<td></td>
<td>good</td>
<td>limited</td>
<td>none</td>
</tr>
<tr>
<td>Tyndall Creek to Shepherd Pass</td>
<td>Big Horn Plateau and vicinity</td>
<td>bunchgrass</td>
<td>good</td>
<td>unlimited</td>
<td>none</td>
</tr>
<tr>
<td>Owens Valley</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shepherd Pass to Independence</td>
<td>base of the hills</td>
<td>bunchgrass</td>
<td>good</td>
<td>several acres</td>
<td>none</td>
</tr>
<tr>
<td>Independence to Onion Valley</td>
<td>base of the hills</td>
<td>bunchgrass</td>
<td>good</td>
<td>limited</td>
<td>none</td>
</tr>
<tr>
<td>Onion Valley to Bullfrog Lake and vicinity</td>
<td>Onion Valley</td>
<td>wet meadow</td>
<td>good</td>
<td>appropriated by pack stock</td>
<td>none coneation</td>
</tr>
<tr>
<td>Vicinity of Bullfrog Lake</td>
<td>wet meadow</td>
<td></td>
<td>fair</td>
<td>appropriated by campers</td>
<td>none</td>
</tr>
<tr>
<td>Kings Canyon National Park</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bubbs Creek</td>
<td>Vidette Meadow</td>
<td>wet meadow</td>
<td>fair</td>
<td>2 or 3 acres</td>
<td>appropriate by campers present</td>
</tr>
<tr>
<td>Trail</td>
<td>Location of Forage</td>
<td>Type of Forage</td>
<td>Quality</td>
<td>Acres</td>
<td>Fence</td>
</tr>
<tr>
<td>-------</td>
<td>------------------</td>
<td>---------------</td>
<td>----------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>Kings River</td>
<td>Vicinity of Ken ayers bunchgrass</td>
<td>good</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Summit Meadow (across the river; privately owned; not visited.)</td>
<td>wet meadow</td>
<td>good</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kings River Canyon to Middle Fork Canyon via Granite Basin</td>
<td>Tent Meadow</td>
<td>wet meadow</td>
<td>good</td>
<td>1 or 2</td>
<td>present</td>
</tr>
<tr>
<td></td>
<td>Granite Basin</td>
<td>wet meadow and fine bunchgrass</td>
<td></td>
<td>unlimited</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>Lougherty Meadow and vicinity</td>
<td>wet meadow and bunch grass</td>
<td>fine</td>
<td>unlimited</td>
<td>none</td>
</tr>
<tr>
<td>Middle Fork Canyon</td>
<td>Blaaspo Meadow</td>
<td>wet meadow</td>
<td>good</td>
<td>20 acres</td>
<td>none or more</td>
</tr>
</tbody>
</table>

**Sierra National Forest**

<table>
<thead>
<tr>
<th>Trail</th>
<th>Location of Forage</th>
<th>Type of Forage</th>
<th>Quality</th>
<th>Acres</th>
<th>Fence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tokopah Valley to Johnson's Camp</td>
<td>Hay Meadow</td>
<td>wet meadow</td>
<td>fair</td>
<td></td>
<td>present</td>
</tr>
<tr>
<td></td>
<td>Dry Meadow</td>
<td>wet meadow</td>
<td>good</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Johnson's Camp to Goddess Canyon via Hollybush and Sceptor Pass</td>
<td>Various meadows between Cerro Gordo and Sceptor Pass</td>
<td>wet meadow</td>
<td>fair</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sceptor Pass to Bishop Pass</td>
<td>wet meadow; a little bunch grass</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Many acres, but feed very sparse. None.*

*Well as present in one very large meadow.*

*3 or 6 (?) p.m. at more.*

*May acres none rather heavily used by cattle.*

*Numerous meadows, rather heavily used by cattle.*
<table>
<thead>
<tr>
<th>Trail</th>
<th>Location of Forage</th>
<th>Type of Forage</th>
<th>Quality</th>
<th>Amount</th>
<th>Fenced Pasture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Devils</td>
<td>Punch bowl</td>
<td>wet meadow and bunchgrass</td>
<td>fair to poor</td>
<td>hundreds of acres, but the country is sheeped</td>
<td>none</td>
</tr>
<tr>
<td>East side of Hell-For-Sure Pass</td>
<td>bunchgrass</td>
<td>fair</td>
<td>large acreage, none but sheeped</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goddard Canyon to Florence Lake</td>
<td>Several meadows in Goddard Canyon</td>
<td>wet meadow</td>
<td>good</td>
<td>an aggregate of perhaps 25 acres</td>
<td>present in at least one</td>
</tr>
<tr>
<td>Blaney Meadows</td>
<td>wet meadow and bunchgrass</td>
<td>fine</td>
<td>many acres</td>
<td>present</td>
<td></td>
</tr>
<tr>
<td>Florence Lake to Silver Pass via Vermillion Valley</td>
<td>Jackass Meadow (or Florence Lake)</td>
<td>wet meadow and bunchgrass</td>
<td>said to be good</td>
<td>several acres</td>
<td>present</td>
</tr>
<tr>
<td>Mono Meadow</td>
<td>wet meadow</td>
<td>good</td>
<td>25 or more acres</td>
<td>present</td>
<td></td>
</tr>
<tr>
<td>South side of Silver Pass</td>
<td>wet meadow</td>
<td>fair</td>
<td>many years, but grazed by cattle</td>
<td>none</td>
<td></td>
</tr>
<tr>
<td>John Muir Trail from Silver Pass to Devils Post Pile</td>
<td>Cascade Valley</td>
<td>wet meadow and bunchgrass</td>
<td>good</td>
<td>about 20 acres</td>
<td>none</td>
</tr>
<tr>
<td>Deer Creek</td>
<td>wet meadow and bunchgrass</td>
<td>good</td>
<td>several acres</td>
<td>none</td>
<td></td>
</tr>
<tr>
<td>Reds Meadow</td>
<td>wet meadow</td>
<td>fair</td>
<td>many acres privately owned; 7 or 8 acres of public pasture</td>
<td>present</td>
<td></td>
</tr>
<tr>
<td>Devils Postpile to Volcanic Ridge</td>
<td>Numerous small meadows</td>
<td>wet meadow</td>
<td>good</td>
<td>aggregate of perhaps 40 acres</td>
<td>present</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>poor shape</td>
</tr>
</tbody>
</table>
### Trail Locations

<table>
<thead>
<tr>
<th>Trail</th>
<th>Location of Forage</th>
<th>Type of Forage</th>
<th>Quality</th>
<th>Amount</th>
<th>Fenced Pastur</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Muir Trail from Devils Postpile</td>
<td>Pumice Flat</td>
<td>bunchgrass</td>
<td>good</td>
<td>many acres</td>
<td>none (7)</td>
</tr>
<tr>
<td>to Tuolumne Meadows</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Between Pumice Flat</td>
<td>bunchgrass</td>
<td>good</td>
<td>limited and sporadic</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>and Shadow Lake (Agnew Meadow lies east of here)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shadow Lake</td>
<td>wet meadow and bunchgrass</td>
<td>good</td>
<td>15 or 20 acres</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Garnet Lake and Shadow Lake Thousand Island Lake</td>
<td>wet alpine meadow poor; stock won't stay</td>
<td>limitless</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rush Creek</td>
<td>wet meadow and bunchgrass</td>
<td>good</td>
<td>limitless</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eyell Canyon</td>
<td>dry meadow</td>
<td>fine</td>
<td>limitless</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tuolumne Meadows</td>
<td>dry meadow</td>
<td>very fine</td>
<td>many acres</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pate Valley</td>
<td>dry meadow</td>
<td>fair, but 1 or 2 acres largely exhausted</td>
<td>none</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rancheria Mountain</td>
<td>top of the plateau</td>
<td>dry meadow</td>
<td>good</td>
<td>many acres</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Miguel Meadow Ranger Station and Swamp Lake (The main Miguel Meadow is being obliterated)</td>
<td>wet meadow</td>
<td>good</td>
<td>several acres</td>
<td>present</td>
</tr>
<tr>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

### Forage Type and Quality

- **bunchgrass**
- **wet meadow**
- **dry meadow**
- **wet alpine meadow**
- **top of the plateau**
- **wet meadow**
- **top of the plateau**

### Amount

- **many acres**
- **15 or 20 acres**
- **10 or more acres**
- **several acres**

### Fenced Pasture

- **none**

**Necessity of Preserving Fragments of Wilderness**

Up until about fifty years ago, several large wilderness areas still remained in California; today, however, the original concept of a wilderness as a vast natural area, scarcely charted and practically uninhabited, finds almost no counterpart in
reality. Only a few isolated fragments have escaped the advancing network of
boulevards, roads and trails which is being constantly extended to capture them,
and at present the majority of these fragments seems doomed. They have been
painstakingly mapped, and an elaborate system of signs posted and trails has been
introduced over which thousands of people circulate each summer; sheep and cattle
graze over much of their area and fish planting crews regularly penetrate their
fastness to distribute added inducement to further invasion. It is significant
that with the disappearance of the original large natural areas the term "wilderness"
has tended to become debased and is now frequently applied to undeveloped tracts
of a few hundred acres, or even a half dozen acres, even though these may be
entirely surrounded by land subjected to intensive human use.

No one denies the value of wilderness contact as an antidote for the physical
and mental shocks caused by the noisy confusion, the purposeless speed and the
narrow artificiality of modern mechanized existence. The chief differences of
opinion seem to occur over such questions as how far a wilderness area can be
pared down in size and still retain its wilderness atmosphere, and how large a
crowd can be turned loose in a wilderness without destroying its essential qualities.
Persons who argue these points sometimes fail to take into account that although
wilderness atmosphere is a very real thing and can be most keenly felt, it is
scarcely measurable in terms of square miles, and is more easily and permanently
destroyed through excessive human development than by fire; indeed, ultimate re-
covery from the last mentioned catastrophe is the rule, but in the case of
possible recovery from the former, experience offers practically no hope.

Now that the wilderness is almost gone, the need for preserving some of the
remaining fragments is all the more imperative.

Present Trend of Destruction

With the exception of certain desert regions (which represent a peculiar type
of wilderness not found elsewhere) the only important wilderness fragments remaining
in California are located along the crest of the Sierra Nevada. This mountain
axis is not traversed by approximately 10 roads between Lassen National Park and
Yahcachapi Pass; only that portion of the mountain mass lying between Tioga Road
and Walker Pass has escaped the process of dissection, and even in this last un-
traversed region the pincher-like extensions of additional roads have eaten far
into the heart of the mountains in three localities, with the ultimate intent of
cutting entirely through the Sierran backbone.

The present status and intended future of these three roads is well shown on
the 1936 road map of the Standard Oil Company of California; their completion will
split the largest remaining wilderness region into three fragments and will con-
siderably reduce the size of the next largest remaining area as well (Fig. 49).
One of these roads is the Kings River Canyon highway, now anticipated as a through
highway to Owens Valley. Perhaps this engineering dream may be postponed for
years (the Forest Service is said to be definitely against it at present) but that
it will fail of ultimate fulfillment once the idea has been planted in the public
mind seems hardly likely. Another of these proposed roads, from Camp Nelson to
Lone Pine, will pass so close to Sequoia National Park that the construction of a
road into the Kern
Canyon will possess overwhelming attraction to an engineer. It will be noted that already these state highways have been given their future designating numbers!

A prominent government official has stated that no spot in California is now more than 10 miles from some road.

Unfortunately the construction of a road into virgin country represents only the first step in the endlessly ramifying process of "developing" the country; from this point of infection attendant highway maintenance stations, gas stations, lodges, stores, cabins, camps, pack outfits, dude ranches, fire protection roads, telephone and power lines, reservoirs, sewage systems and new trails keep spreading out, and push the wilderness frontier farther and farther back into the mountains. Then, if the area is pared down beyond a certain point, or even if the trails become excessively boulevard-like or numerous, and carry great throngs, the elusive wilderness flavor vanishes, often quite suddenly.

The Wilderness Problem in the National Parks

The Problem of Use. The problem of how to let the public use the parks while still keeping the latter natural is one whose magnitude is everywhere recognized. What may not always have been so clearly felt, however, is that there is a positive saturation point beyond which further concentration of people will destroy the very thing which they seek, and that in some areas this saturation point has already been exceeded.

In wilderness areas the saturation point is very easily exceeded, but this factor is largely compensated by the unwillingness of the great majority of people today to venture as far away from their automobiles as wilderness penetration demands. Of those few who do enter the wilderness, a still smaller number are willing to leave the beaten path; the remainder will seldom be so numerous as to destroy the wilderness atmosphere — this destruction is largely accomplished by efforts to coax large numbers of less venturesome individuals into the wilderness by the construction, even in remote places, of ready-built camp sites and extensive systems of easy trails, which require the exercise of a minimum amount of energy and ingenuity on the part of the visitor.

The Pressure for Further Development. Probably no one is more keenly aware of the pressure for further development than the unfortunate park superintendent, who must constantly, even if not always successfully, try to stem the tide of demands for further penetration of natural areas. In view of the threatened disappearance of most of the remaining wilderness area, however, it would seem imperative to call a final halt to this type of "improvement" before it is too late.

Already those who want more roads, more public campgrounds, more gas stations and more trails to scenic points, obtained these improvements for themselves throughout approximately 99 percent of all recreational areas in California, including most of the choicest portions of the national parks. On the basis of relative numbers of persons involved, this may be an equitable division; real unspoiled wilderness is neither demanded nor fully appreciated by the uncritical majority, which is usually well satisfied with large semi-wild outdoor regions which have been made safe for the uninitiated, comfortable for the infirm, and accessible for those who take their vacations while in full flight. In any event, however, the minority which can appreciate a wilderness should not be deprived of the remaining one percent. If the unhealthy tension of modern life continues to increase, as many think it will, the value of the few real remaining wilderness areas will increase beyond all price for those who periodically need to be treated to solitude and unspoiled beauty in order to retain a normal perspective.

Possible Direction of Solution. The thought has been expressed during the
last year or two by a number of conservationists and wilderness-minded folk that perhaps the Service will be unable to withstand the pressure for development until every corner of the parks has been invaded and the wilderness values submerged. Such persons have explained their opposition to the addition of the Kings Canyon, Mount Olympus and similar areas to the National Park system on the ground that they consider the regions in question to be safer from human interference under their present status. Perhaps it is in recognition of this point of view that the Forest Service has reserved from future development eighteen "Primitive Areas", comprising 2,000,000 acres, which it is said will be maintained in a primeval condition for all time. The largest of these areas is the "High Sierra Primitive Area" which extends from the Devils Postpile to Sequoia National Park (this area is not entirely homogeneous even now, however, as regards wilderness conditions, and with the completion of the Kings Canyon and Florence Lake-Sabrina Lake roads would be split into three pieces; (see Fig. 49).

Notwithstanding the pessimistic attitude referred to, a more hopeful view of the wilderness problem seems possible. In California (and various other states) an extensive and truly outstanding system of state parks is being created. The idea of providing additional municipal and county parks is also in the air. These local parks cannot hope as a rule to include large areas of wilderness land. Usually they have been purposely located near great human population centers so as to serve the largest possible number of individuals. They do not compete with the national parks; they supplement them. To the local parks properly belongs the function of handling huge crowds; preservation of truly primeval features is a goal which is striven for, but it is usually definitely secondary. To the national parks, on the other hand, properly belongs the function of preserving superlative natural regions, including wilderness areas, as little changed as possible for the benefit of posterity; attentiveness to the pleasure and comfort of the people is of course an equally important function, but if it means the pleasure and comfort of absolutely unlimited numbers of people, this second function is likely to destroy the first. A partial solution of the problem created by this dual function would seem to lie in: (a) realization that the national park areas cannot hope to accommodate unlimited numbers of people and that soon a line will have to be drawn against further development, particularly of roadways (b) promotion of more extensive state, county and municipal park systems to share the recreational burden (c) definite recognition of remnant wilderness areas and establishment of a code of administration designed to protect them from all but the very simplest maintenance activity.
Fig. 49. Map showing present status of wilderness areas in the Sierra Nevada, and the effect of constructing proposed state highways No. 168, 180 and 190; boundary of present wilderness areas; wilderness areas as reduced by the proposed road construction.