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A REPORT ON THE STATUS, CHANGES, AND ECOLOGY
OF BACK COUNTRY MEADOWS
IN
SEQUOIA AND KINGS CANYON NATIONAL PARKS

Note that this report is dated as being submitted July 23, 1958, whereas on page 4 the itinerary states the date of inspections and appraisals as being done in the year 1959. This of course could not be, and is obviously a mistake. I know for a fact that the field work was done in 1958, as I accompanied Sharsmith on some of it in the Charlotte area in 1958. The report was submitted in 1959. This mixup in dates was probably due to typing error &/or oversight in later proofreading.

Clay E. Peters
Clay E. Peters
December 20, 1962

Submitted
July 23, 1958
by
Carl W. Sharsmith



ITINERARY (continued)

Little Pete and Big Pete Meadows; Dusy Basin

August 8.

Simpson Meadow

9-10.

Upper Leconte Canyon

11.

Colby, McClure, and Evolution Meadows

12-13.

Grouse Meadow

14-15.

Simpson, Daugherty, and Fallon Moon Meadows

16-17.

Goat Mountain Meadows: Wildermuth Meadow

18-19.

Paradise Valley

21.

Cement Table

23.

Junction Meadow on the Kern

24-25.

Timberline Lake and Crabtree Meadow

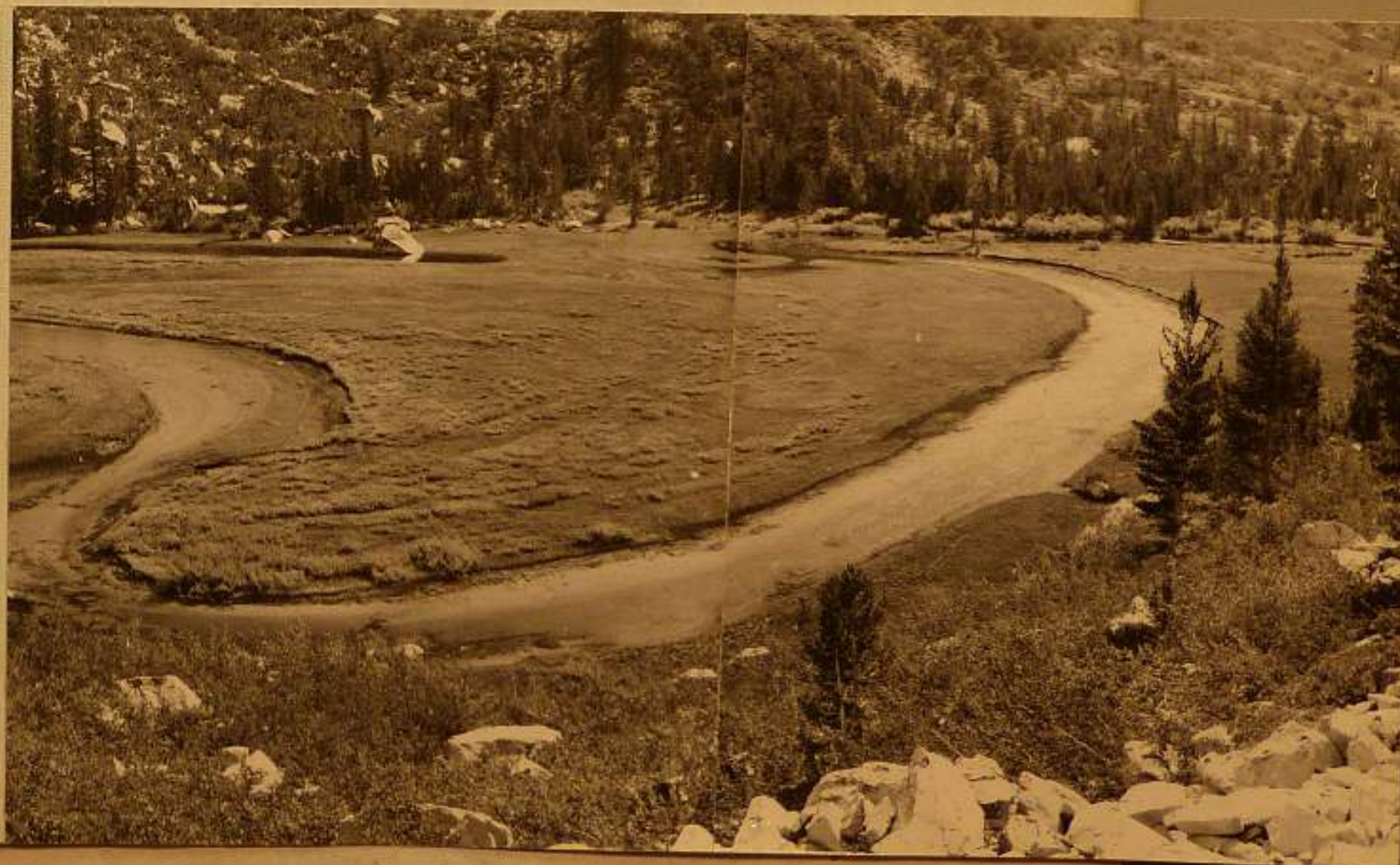
26-28. - 41

Big Wet, Scaffold, and Williams Meadows

29-30. 41

Hockett, Sand, Mitchell, and South Fork Meadows

September 3-6



Grouse Meadow



Fig. 1. Tent
Meadow as it
appeared in
1940.

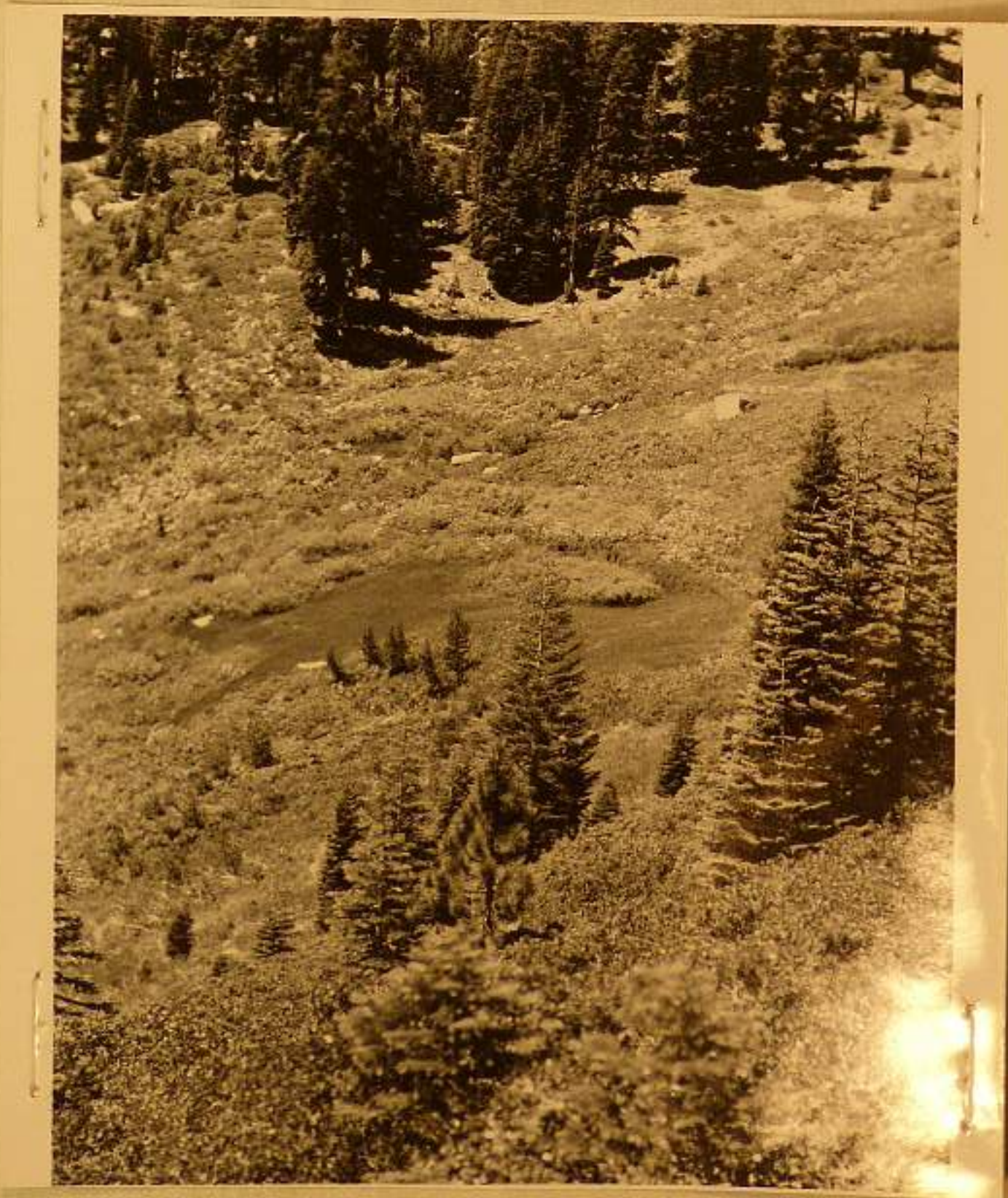


Fig. 2. Tent
Meadow, from a
closer but other-
wise similar
view, as it
appeared in
1958. No change
is evident.



Fig. 3. Goat Mountain Meadow No. 1, as it appeared in 1940.



Fig. 4. The same meadow in 1958. It shows no important change.



Fig. 5. Goat Mountain Meadow No. 2, as it appeared in 1940. It then showed invasion by falsehellebore and, in the far distance, also invasion by lodgepole.



Fig. 6. The same view of the meadow in 1955. The "front" of the falsehellebore invasion stands at the same position it stood in 1940, and the same seems to apply to the lodgepole.



Fig. 7. In 1940 Wildermuth Meadow showed a virgin condition which it had long previously sustained.



Fig. 8. In 1958 Wildermuth was in the same virgin condition. The falsehellebore in the foreground, shown more clearly by tilting the camera, is about as distant as it was in 1940 from the nearest, tallest tree out in the meadow.



Fig. 9. Sedge marsh and lake beneath Goat Mountain in 1940.



Fig. 10. Essentially the same view of the marsh in 1958. Although willows in the foreground partly obscure the view, the extent of marsh and lake appear to be about the same.



Fig. 11. Meadow in Granite Basin as it appeared in 1940. Dust wallows caused by fairly heavy use are indicated by arrows.



Fig. 12. By 1958 the scars of the former dust wallows had healed. Their former location serves as a means of orienting this view. No appreciable change is shown in the form, density and distribution of the willows.



Fig. 13. The highest meadow of a series on the north side of Granite Pass as it appeared in 1940.



Fig. 14. The same meadow in 1958. The intricacies of its surface seem to show an unchanged pattern.



Fig. 15. The lowest meadow of the series on the north side of Granite Pass in 1940.



Fig. 16. The same view in 1958. There appears to be no significant alteration whatever in the features of this meadow.



Fig. 17. Fallen Moon Meadow as it appeared in 1940.



Fig. 18. The same view of Fallen Moon Meadow in 1958. Although some lodge poles have recently established themselves on its border, very few have succeeded in invading its open expanse in eighteen years.



Fig. 19. A close-up of still the same view shows more clearly two of the invading lodgepoles. Their growth is much repressed.



Fig. 20. Ouzel Meadow as it appeared in 1940.



Fig. 21. Ouzel Meadow in 1958. A few lodgepoles have appeared, but most of these have been broken down by storms. Other than this there appears to have been relatively little change.



Fig. 22. Vidette Meadow as it appeared in 1940.
The willow thickets were thinning out.



Fig. 23. Vidette Meadow in 1958. The willows have
practically disappeared. Evidently the degree of use
to which this meadow is subjected is such that it
does not promote an increase of willows.

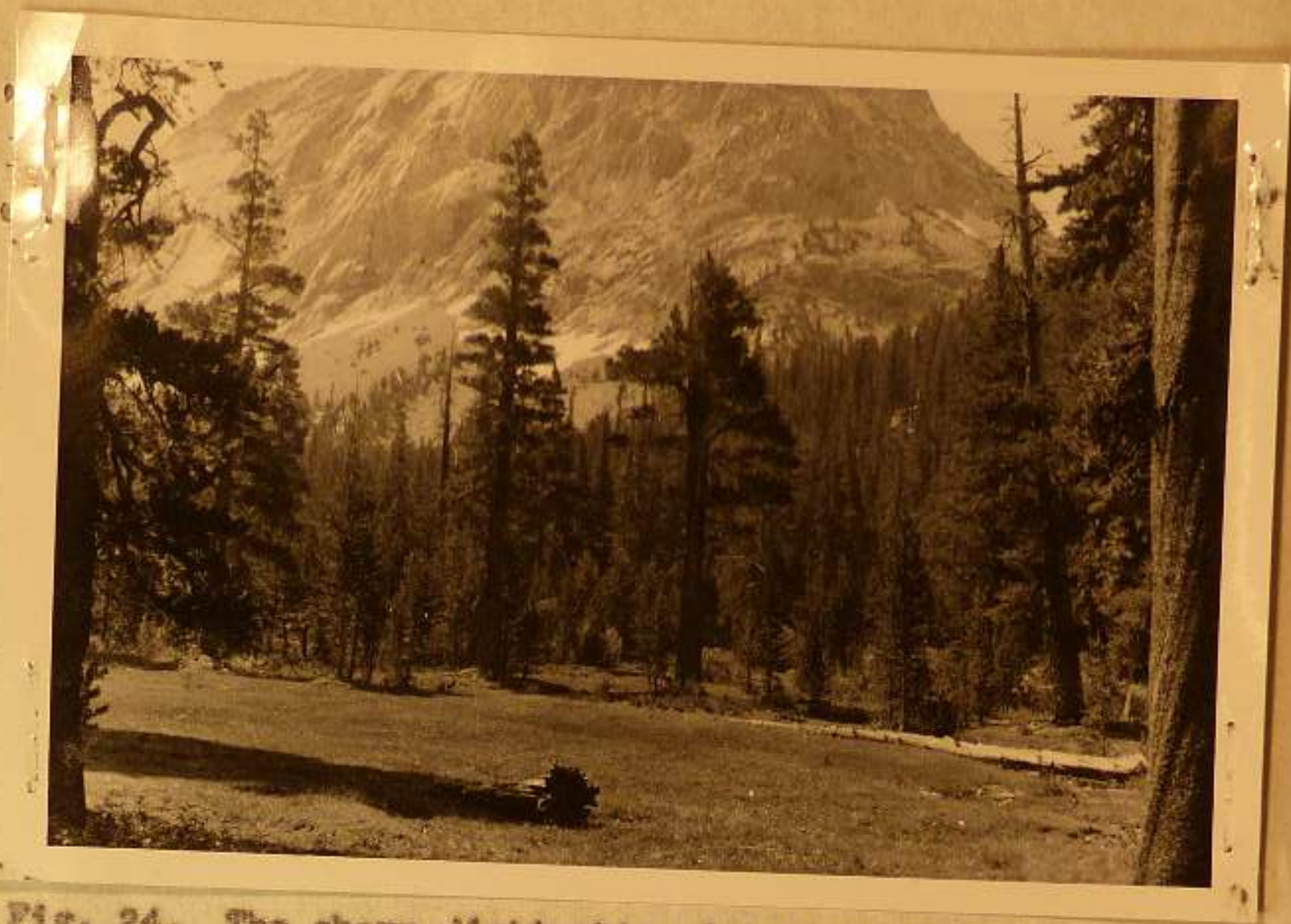


Fig. 24. The sharp distinction into two age-classes of trees is easily seen in this view of the stand of lodgepole which borders Vidette Meadow. This clear separation is rather confined to the meadow margins. Local disturbance was undoubtedly the cause of the upsurge of reproduction.



Fig. 25. This perennial patch of nettles covers most of the nearby shaded area shown in this view of Vidette Meadow. It is immune to grazing.



Fig. 26. First Charlotte Lake Meadow in 1940. The effects of erosion are quite evident.



Fig. 27. First Charlotte Lake Meadow in 1958. High water conceals some but not all of the effects of the continued, severe erosion. Since 1940 several inches of soil have been removed from the stream banks which show in the middle foreground.

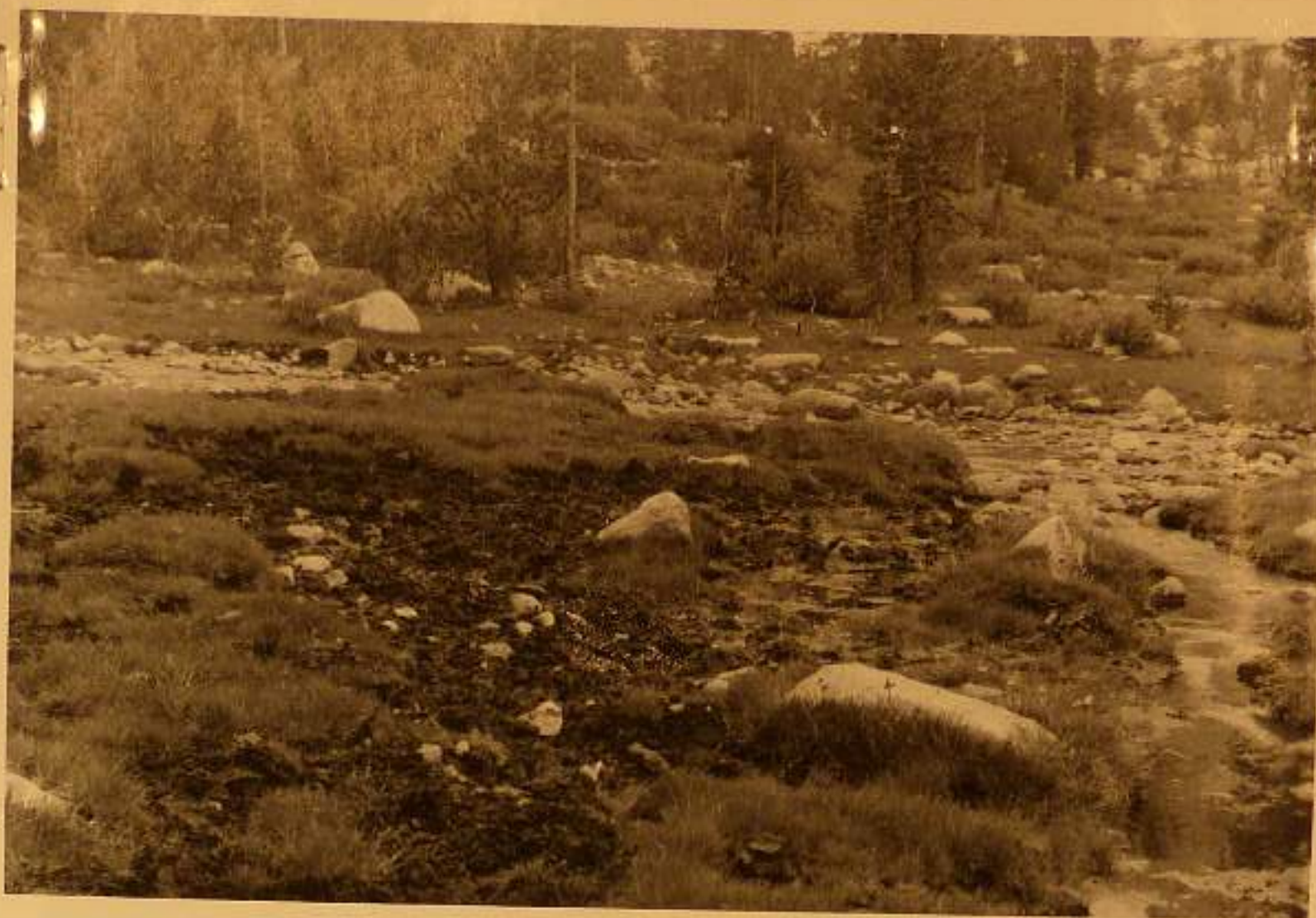


Fig. 28. View of only one of the trampled and severely eroding areas along the trail bordering first Charlotte Lake meadow. The regular trail (right margin) is "running a creek."



Fig. 29. Sphagnum curving as a billow over a bank on first Charlotte Lake meadow. Probably no other kind of plant is more efficient in raising the water table. Knife-handle (right) is $3\frac{1}{2}$ inches long.

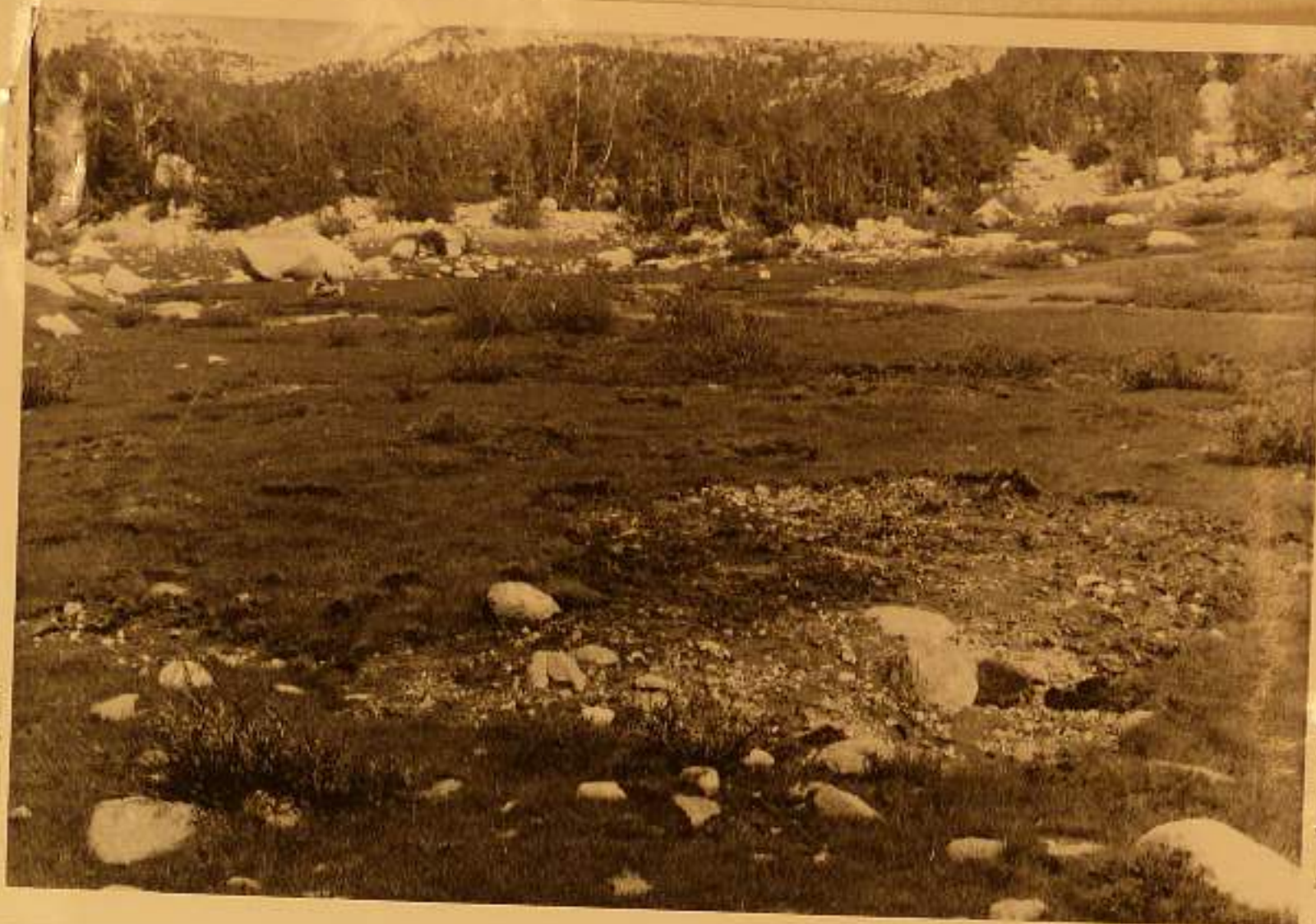


Fig. 30. Local destruction of cover, Bullfrog Lake Meadow.



Fig. 31. Ouzel Meadow shows very little change over the years.



Fig. 32. Eastern portion of Junction Meadow as it appeared in 1940.

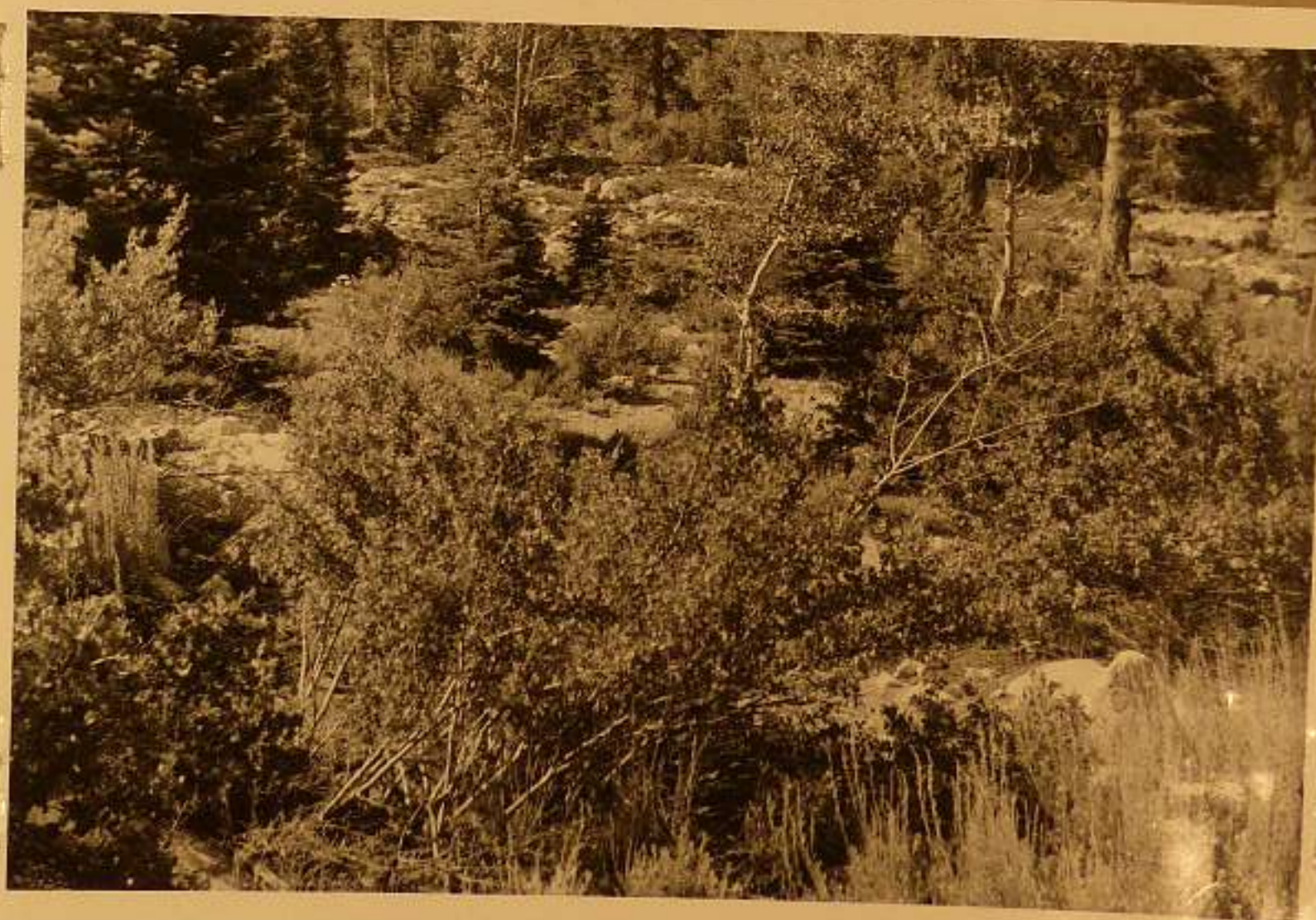


Fig. 33. Same view of eastern portion of Junction Meadow as it appeared in 1958. During the interval 1940-1958 the growth of aspens and brush has not been sufficient to cover the numerous bare spots; invasion by Red Fir has increased, while at the same time the scanty forage has almost disappeared.



Fig. 34. Most of the ground cover in this view of a portion of Junction Meadow is composed of weeds in which annual species predominate and thereby indicate a late stage of meadow deterioration.



Fig. 35. The weed patches scattered in this badly overgrazed portion of Junction Meadow began their existence not more than about seven years ago.



Fig. 36. Charlotte Meadow as it appeared in 1940. At that time this meadow was badly trampled and overgrazed.



Fig. 37. The same view of Charlotte Meadow in 1958. The taller, heavier brush now almost conceals the abundant forage from view.



Fig. 38. This view of Charlotte Meadow in 1958 shows a return of forage to a state of almost virgin luxuriance. Unless the ground dries out the patch of Western Bracken shown in the background beneath the largest rock should not advance appreciably.



Fig. 39. Another view of Charlotte Meadow in 1958. Nebraska Sedge is three feet high.



Fig. 40. Junction Meadow on the Kern. The leader of the nearest lodgepole invader grew two feet in length in 1958.



Fig. 41. Junction Meadow on the Kern in 1958. As a result of invasion during the ten to fourteen years immediately preceding 1958, lodgepoles have captured perhaps thirty percent of this meadow. The hat on the ground is merely to show more clearly the overcropped cover. At the time when the photograph was obtained practically no available forage existed.



Fig. 42. Meanwhile erosion is also reducing the area of meadow shown in this view of Junction Meadow of the Kern.



Fig. 43. Timberline Lake Meadow is being quickly transformed by the invasion of an inferior forage that promptly replaces a superior one which is rapidly being destroyed.



Fig. 44. Timberline lake Meadow. More remnants of short-hair meadow remain in badly trampled portions.



Fig. 45. Meadow stringer below Timberline lake Meadow showing an exchange of new gullying sites for old. The trail which formed the first gully has been abandoned.



Fig. 46. Crabtree Meadow. The lack of invasion, the dense, uniform growth of herbage, and the normally developed streambanks shown in this view indicate stable ecological conditions.



Fig. 47. The lower end of Crabtree Meadow shows stages in recovery from the effects of severe trampling.



Fig. 48. One of the meadows in close proximity to Rae Lakes, as it appeared in 1940. It then showed evidence of heavy use.



Fig. 49. The same meadow (as shown in Fig. 48) as it appeared in 1958. There are no evident changes. It still shows signs of heavy use.



Fig. 50. Sloping margin of a heavily used but largely undamaged meadow bordering Rae Lakes. The erosion shown is normal. The colony of Jeffrey Shootingstars is making only a negligibly slow, forward advance.



Fig. 51. Erosional damage along the Sixty Lakes Basin trail on a meadowy slope above Rae Lakes.



Fig. 52. Sixty Lakes Basin trail needlessly crossing and damaging a meadow at Rae Lakes.



Fig. 53. The point of origin of this erosional damage on a meadow by Rae Lakes is the same Sixty Lakes Basin trail which in this view crosses from left to right under the snowbank and is invisible. It is very doubtful of this damage existed eighteen years ago.



Fig. 54. Simpson Meadow as it appeared in 1940.



Fig. 55. Simpson Meadow in 1958. Willow thickets have been removed or have become altered by fire, but other than this the meadow appears to have remained unchanged. The area was in good condition.



Fig. 56. Simpson Meadow. Succession in a moist, burned out site which three years earlier was covered by a dense willow thicket. The outer margin of the burn is dimly visible as a line extending from left to right in the far distance as well as across the foreground.



Fig. 57. Simpson Meadow. Succession in a drier burned out site which about three years earlier was also covered by a dense willow thicket. The early weed stage composed of an annual grass is giving way to a secondary weed stage composed of broad-leaved herbs.



Fig. 58. Portion of Goddard Pasture ten years following the fire of 1948. The luxuriant stand of Tufted Hairgrass is four feet high.



Fig. 59. Trampled dry flat at the upper end of Goddard Pasture. The thinning stand of herbage in front of the scattered shrubs of Sagebrush and Goldenbush represents a primary and secondary weed stage which in this instance is mostly composed of Cheatgrass Brome, Bottlebrush Squirreltail, and Elmer Needlegrass, and is indicative of the overgrazing.



Fig. 60. Lower Meadow of Paradise Valley as it appeared in 1940.



Fig. 61. Lower Meadow of Paradise Valley as seen in 1958 from exactly the same viewpoint as that used in 1940 for Fig. 60. A tree which concealed from view the aspen thicket at the upper left has since 1940 died and fallen, and on the meadow continued overuse has resulted in bare spots and an increase of falsehellebore.



Fig. 62. Another view of Lower Meadow of Paradise Valley as it appeared in 1947. The beginning of lodgepole invasion from the forest at the far end of the meadow is barely if at all suggested.



Fig. 63. The same view of Lower Meadow of Paradise Valley but as seen in 1968. The dotted line encloses arrows indicate the invasion which has developed essentially since 1948.



Fig. 64. View of portion of Middle Meadow of Paradise Valley, showing a patchy stand of meadow climax persisting amid a secondary weed stage of the succession.



Fig. 65. Bank covered with Cheatgrass Bromes along the trail one mile below Paradise Valley. In the Sequoia-Kings this non-native weedy grass and pioneer in the succession does not flourish at altitudes much above 7,000 feet.



Fig. 66. Scaffold Meadow tourist pasture in 1947. The deteriorated appearance is evident rather generally, and the foreground shows only a very sparse cover and patches of bare soil. The deterioration because of overuse was, however, intensified by the drought conditions which then prevailed.



Fig. 67. Scaffold Meadow tourist pasture in 1958. It shows much improvement over the condition of 1947, but the favorable effects of protection have also been promoted by the very good moisture conditions.



Fig. 68. Scaffold Meadow tourist pasture in 1940 (September 25).



Fig. 69. Scaffold Meadow tourist pasture in 1958 (August 29). The appearance of the meadow seems to be much as it was in 1940, which was also a wet year.



Fig. 70. Patches of secluded woodland meadow immediately below Scaffold Meadow tourist pasture show the results of excessive, concentrated use.



Fig. 71. What looks like forage in this view of Grass-hopper Meadow is mostly weeds indicative of a late stage of meadow deterioration.

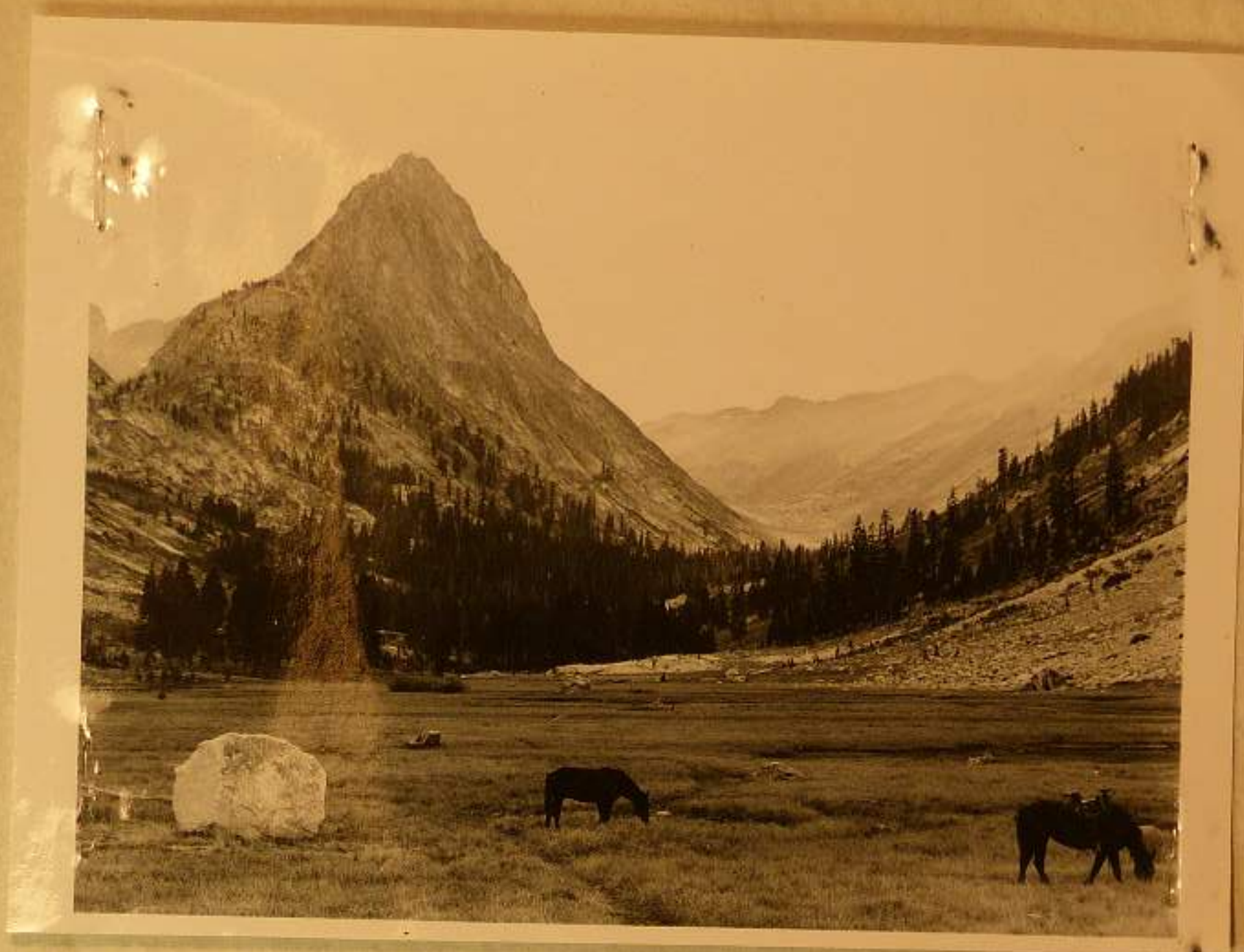


Fig. 72. Big Wet Meadow as it appeared in 1940 (September 23).



Fig. 73. Big Wet Meadow in 1958 (August 29). The improved condition of the area is due to more than merely the more favorable moisture conditions of an earlier date in a wetter season.



Fig. 74. Stream banks in Big Wet Meadow as they appeared in 1940. The bare sand bars and undercut and broken banks were evidence of serious overgrazing in the past.



Fig. 75. The same stream banks in Big Wet Meadow in 1958. A remarkable amount of recovery has occurred since 1940.



Fig. 76. All this damage to only one portion of Big Wet Meadow could be avoided by relocating the trail to the higher ground which skirts the meadow. There is no longer any good reason for the continued existence of the trail through the meadow. Even aside from the damage it creates, because of the deep mud and bog holes it isn't even a short-cut to the other end, and the meadow, like any other wet meadow, would be much better off (and so would the stock) if the trail went around it instead of through it. In Sequoia - Kings Canyon National Parks the aggregate total of meadow trampled out of existence into mud by heavy use of trails through them during one wet season must in terms of acreage be very considerable.



Fig. 77. Boggy Meadow as it appeared in 1947.



Fig. 78. In 1949 Boggy Meadow was fenced and measures were applied to prevent further erosion. In 1958 when this photograph was obtained the improvement over the same view (as that shown in Fig. 77) was obvious. On the area of meadow on the left the formerly deteriorated cover of Baltic Rush has attained full recovery.



Fig. 79. Portion of gully in Boggy Meadow in 1947. More than just mechanical injury by trampling cattle accounts for the sparse success of invasion by lodgepoles over a period of 21 years (1926-1947).



Fig. 80. A view of the same portion of gully in Boggy Meadow in 1958 shows the flourishing state of mostly the same invaders. But it has taken altogether 32 years for this much invasion to occur.



Fig. 81. In 1941 or fifteen years after the catastrophe occurred the gully in Boggy Meadow in this view was still largely barren.



Fig. 82. In 1958 or thirty-two years after the catastrophe recovery is at last making some real headway.

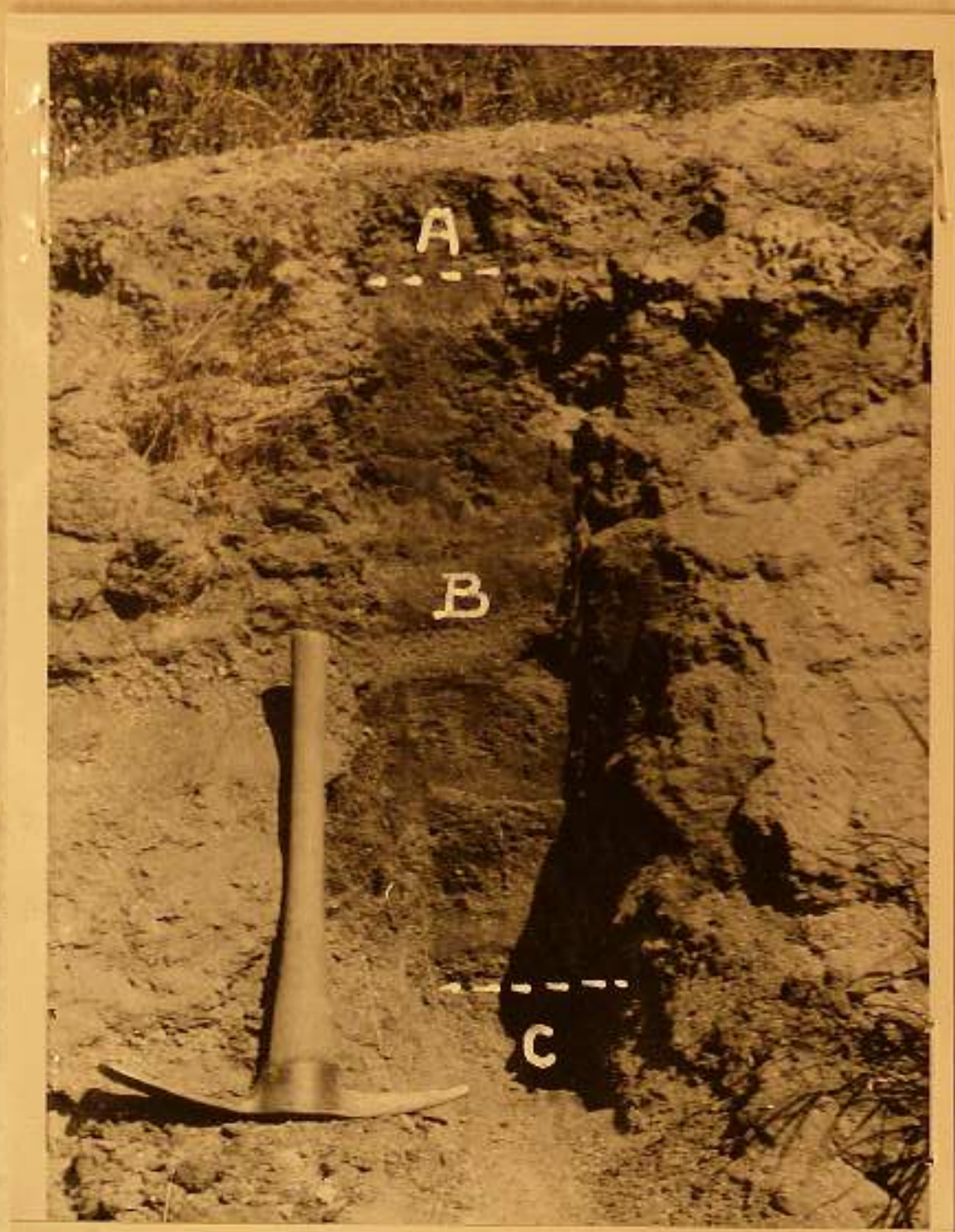


Fig. 83. This shows in vertical section mature meadow soil in Boggy Meadow such as was stripped away when the gully was formed. The overall length of the pick handle is $16\frac{1}{2}$ inches. At "A" is a 5-inch layer of the more productive topsoil, at "B" a considerably deeper layer of subsoil, at "C" the uppermost portion of the weathered but sterile parent material which lies below the soil. It is rather probable that soil of this depth is rather typical of mature meadow soil of residual origin in meadows situated at altitudes between 6000-8000 feet.



Fig. 84. Comanche Meadow was so saturated with water all through the 1968 season that much of it was a quaking bog. The tolerance of lodgepoles for a soil which becomes continually water-saturated is limited.



Fig. 85. View of Williams Meadow as it appeared in 1947. Except for the weeds in the foreground and the few, scattered lodgepoles invading across its wide expanse, there is little to suggest the deterioration and erosional damage which then existed in this scenically very impressive meadow.



Fig. 86. Early in the season of 1958 and before the cattle had arrived the same view of Williams Meadow was more suggestive of its original, primitive state. Note the absence of the former, invading lodgepoles.



Fig. 87. View of sand flat at lower end of Williams Meadow as it appeared in 1958. Up to 1950 this flat had been severely abused and except for a scattering of lodgepole invaders it was practically destitute of vegetation. The present improved appearance is obvious. The lodgepole invaders, however, which formerly had been suppressed by trampling livestock are now growing vigorously and will soon shoot up.



Fig. 88. Close view of the same flat in 1958. The clumps of Ovalhead Sedge have developed within a few years of protection. They indicate improved soil moisture conditions and will continue to succeed the pioneer weeds.



Fig. 89. Grouse Meadow as seen from its lower end in 1940 (August). The area in the foreground shows signs of heavy use, but little or no falsehellebore is in evidence.



Fig. 90. Same view of Grouse Meadow, as it appeared in 1958. A recently-begun and rapidly increasing invasion of falsehellebore is advancing into the meadow.



Fig. 91. Grouse Meadow as seen from its upper end in 1940 (August). (With respect to the arrows, see below.)



Fig. 92. The same view of Grouse Meadow as it appeared in 1958 (August). A slow increase in lodgepole invasion is under way. The same small lodgepoles (indicated by arrows) show very little increase in size since 1940. The area below the dotted line shows the blueberry thicket from which they arise.



Fig. 93. Lodgepole arising from blueberry thicket on the open expanse of Grouse Meadow in 1958.



Fig. 94. All the lodgepoles in the middle distance of this view of Grouse Meadow in 1958 arise from blueberry thickets.



Fig. 95. Big Pete Meadow in 1940 showed evidence of heavy use.



Fig. 96. In 1958 the same view of Big Pete Meadow shows the beginnings of a false-hellebore invasion.



Fig. 97. On closer view Big Pete Meadow in 1958 exhibits an increase of lodgepoles in a small area on its opposite side.



Fig. 98. Distant view of meadows in Upper LeConte Canyon in 1940.



Fig. 99. The same view of the meadows in Upper LeConte Canyon in 1958 shows no important alteration in the pattern of the streamways.



Fig. 100. In this view, Colby Meadow in 1940 showed destruction of sod and streambank erosion.



Fig. 101. The same view of Colby Meadow in 1958 shows that the rim of the streambank has remained intact, which in itself would indicate that streambank erosion has not increased.



Fig. 102. View of Colby Meadow in 1940 showing a trampled and denuded patch.

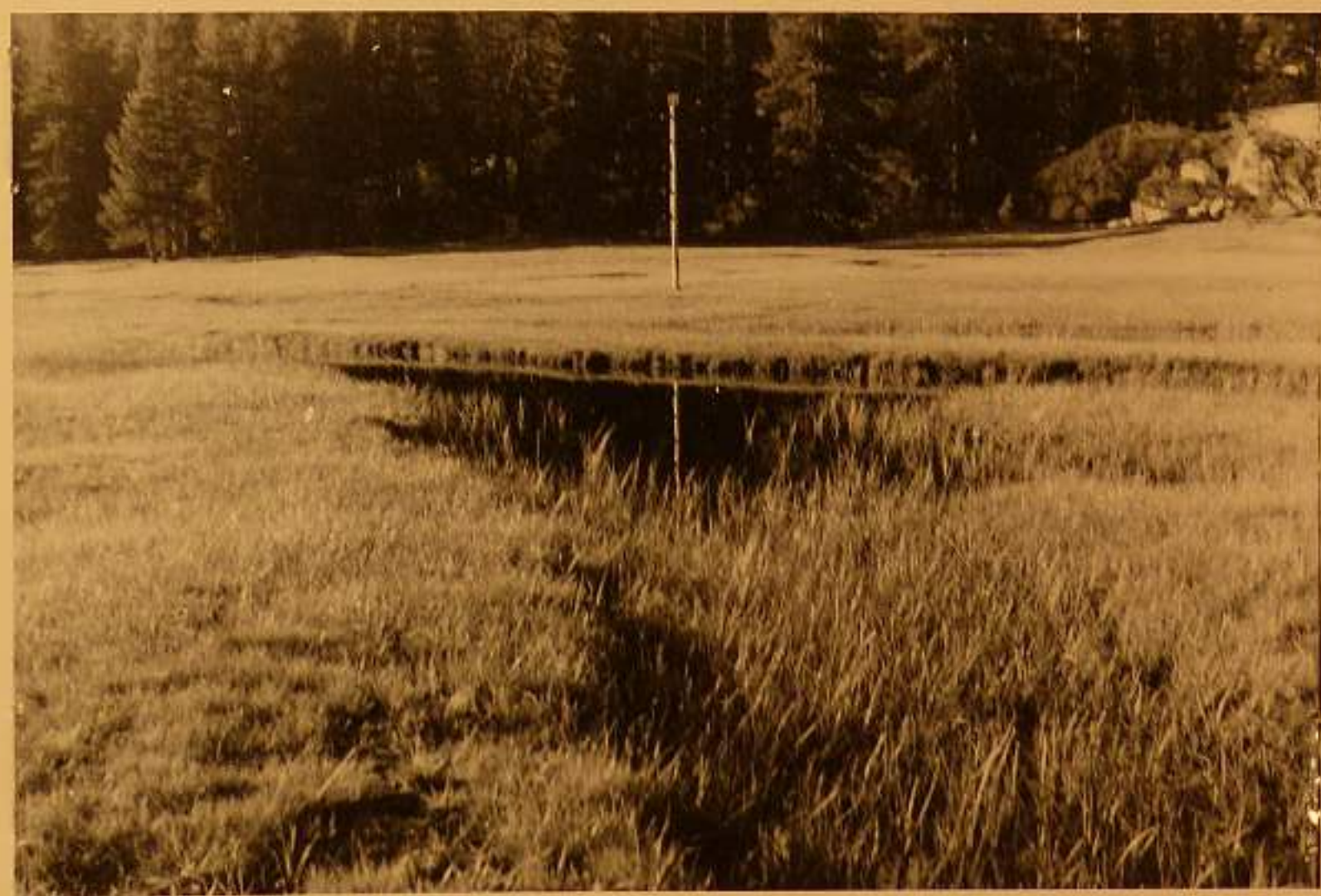


Fig. 103. The same view of Colby Meadow in 1958 showing the strong trend to recovery on the same formerly trampled and denuded patch. Beaked Sedge is the advancing pioneer.

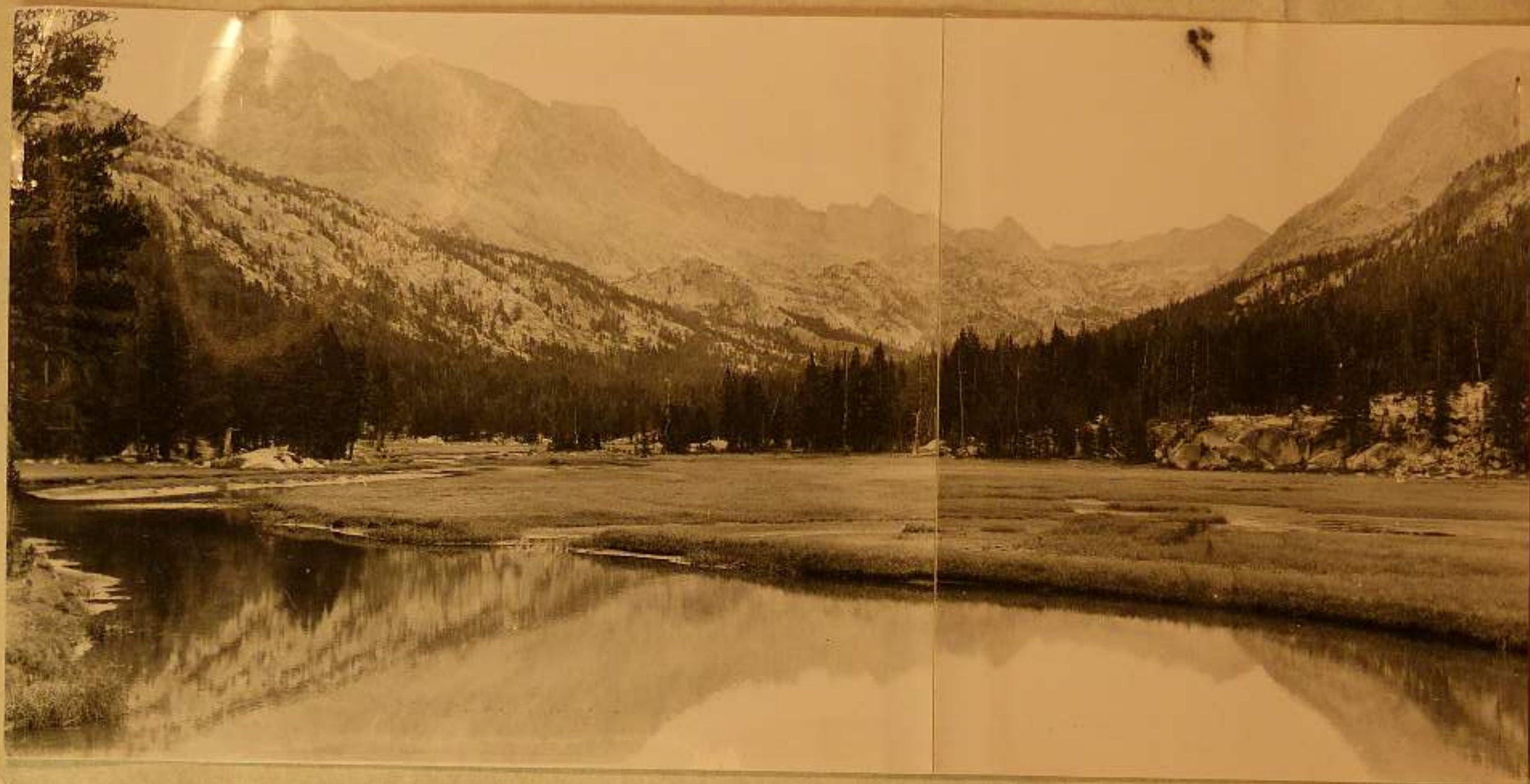


Fig. 104. McClure Meadow as it appeared in 1940.
(August 31-September 1).



Fig. 105. The same view of McClure Meadow in 1958
(August 13) showing flooded conditions persisting
well into August.



Fig. 106. Another view of McClure Meadow in 1940.



Fig. 107. Except for the signs of "early-season" overuse showing in the foreground, in 1958 the same view of McClure Meadow showed no important change.



Fig. 108. Evolution Meadow as it appeared in 1940, showing some lodgepole invasion.



Fig. 109. The same view of Evolution Meadow in 1958. There has been relatively little lodgepole reproduction since 1940; only the size of the trees has increased.



Fig. 110. Severe trampling injury along the trail through McClure Meadow in 1958. This damage is as extensive as that caused by the trail through Colby Meadow. Each animal chooses a different route and unless the meadow dries out quickly (which is scant hope for a wet meadow) the damage becomes progressively worse.



Fig. 111. Similar injury along the trail just above Woods Lake in 1958.



Fig. 112. Castle Domes Meadow in 1940 (about August 13). Little or no falsehellebore was evident in this view.



Fig. 113. Same view of Castle Domes Meadow in 1958 (August 2). Falsehellebore is now rampant.



Fig. 114. Another view of Castle Domes Meadow in 1958. A lodgepole invasion is undergoing a slow increase.



Fig. 115. Castle Domes Meadow. As in the adjacent portions of the Kings, forage in this meadow is so scarce that even the poorest is of strategic importance. There appears to be no good reason why the trail should be located where it serves to extinguish some of it.



Fig. 116. Around the margin of Sand Meadow the belt of lodgepole invasion extends almost unbrokenly, but only a portion of it is shown in this view.



Fig. 117. The wall of old forest, the belt of invasion, and evidence of repression are all clearly shown in this very instructive view of Sand Meadow.



Fig. 118. Except for the faint trace of a former trail across the foreground and perhaps aside from the beginnings of invasion, Mitchell Meadow from this view has the appearance of a meadow which has never been disturbed.



Fig. 119. Mitchell Meadow. The invasion shown on the right was probably caused by disturbance; the one on the left is natural.



Fig. 120. Lodgepole invasion on a portion of South Fork Meadow in 1958. As elsewhere on the meadow the extent of the stand is apparently not being augmented as rapidly as it was when the invasion was initiated. New reproduction is relatively scant. Thus any result which entrenchment of the stream channel may have by indirectly effecting the rate of invasion is not yet evident; however, only two years have elapsed since the floods occurred.



Fig. 121. Flood damage at the lower end of South Fork Pasture. Floods of an intensity sufficient to create damage of this extent are produced by rare combinations of meteorologic causes and therefore are extremely infrequent and may not strike the same meadow again for hundreds of years. Their effect on the ecology of the meadow is profound. They often result in a drying out of the circumjacent borders and increased lodgepole invasion but owing to variables the prediction for any given case is fraught with hazard.

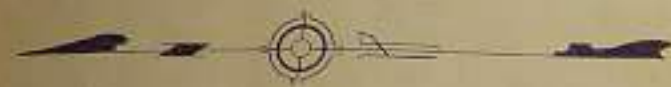
HERA SHANT
STONER PARK



LEGEND -
ROAD
TRUCK TRAIL
TRAIL
FENCE
GRAZING AREA

DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
SEQUOIA NATIONAL PARK
MEADOW FORAGE
OFFICE OF THE CHIEF ENGINEER
SAN FRANCISCO, CALIF.
MAY 1936
REVISED - AUG. 1937

SEQ-5184-A



LEGEND

PARK BOUNDARY ———

ROAD ———

TRAIL - - - - -

PASTURE AREA (MEADOW) SCATTERED

DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
KINGS CANYON NATIONAL PARK
MEADOW FORAGE

OFFICE OF THE SUPERINTENDENT
ASH MOUNTAIN, CALIF.
APRIL, 1956

SCALE IN MILES
0 1 2 3 4 5

REDWOOD MOUNTAIN AREA
GRANT GROVE SECTION

5K-2285
NP

Problem mds.

↗ Vidette - very limited grazing.

First Charlotte mdr - relocate trail from north edge.
No snowing

Bullfrog Lakes mdr - no grazing

East Lake mdr - very limited grazing

↘ Junction mdr (Kern)

(Kern) Junction mdr (Kern) no grazing

Timberline mdr no grazing & camping.
relocate trail.

④ Erosional damage at base of trail to 60 Lakes
Basin - Relocate trail.

Lower Paradise mdr - no grazing, remove lodgepole
invasion & plug gully.

Middle Paradise mdr - no grazing

Scaffold mdr - Reduce grazing

Grasshopper mdr - Relocate trail

Big Wet mdr (Deadman Canyon) - very good &
recovered - merely relocate trail.

④ House mdr - eradicate False Hellebore
periodically.

Stillwater mdw (Lower Deer Mdw by summer, 1941)
Changed to woodland type since 1929.
Forage OK but reduced — remove
newer invasion trees.

Little Pete mdw — recent but moderate
increase in Falsehellebore. Range
condition good.

Big Pete mdw — Falsehellebore & lodgepole
invasion — Range good.

Meadows in Upper Elkton Canyon
Local stream bank erosion continues,
otherwise meadows fair.

Colby mdw — trends towards improvement —
merely relocate trail.

McClure — Floods so should not be
grazed until late in season. Re-
route trail. Range condition otherwise
continues good.

Meadows, Woods Lake Basin — Re-route trails.

Junction of South & North Forks of Woods
Creek - Meadows bad; weedy, over-
grazed, invaded by trees - Restrict
grazing somewhat.

Castle Domes Meadow - Invaded by Falsehellebore
& woods.

Restrict grazing - remove Falsehellebore
& possibly lodgepole pines.

Indicators of an earlier stage of Deterioration

Western Yarrow *
Falsedragon Sagebrush
Mulleaf Mugwort Wormwood
Field Mint
Common Selfheal
Ficklegrass
Fargleaf Avena
Chick Goldenrod

Indicators of Climax or subclimax

Canyon Sedge	Rusty Sedge
Kentucky Bluegrass	Subalpine Needlegrass
Tufted Hairgrass	
Baltic Rush	
Blue Wild Rye	
Slender Wheatgrass	
Mountain Brome	
Fringed Brome	
Bearded Fescue	
Tufted Hairgrass	
Elmer Needlegrass	

Indicators of a late stage of deterioration

Annual Hairgrass *

Cheatgrass Brome *

Sheepsorrel *

Cudweed *

Douglas Knotweed *

Lambquarters Goosefoot

Hairy Popcornflower

Slender Jarweed

White Hedge-nettle

Sierra Willowweed

Mountain Bluecurls

Whitetip Clover

Littlehead Clover

Hairy Orthocarpus

Gayophytum sp.

* Indicates species of exceptional reliability