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Author(s): S. Charles Kendeigh

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RESEARCH AREAS IN THE NATIONAL PARKS, JANUARY 1942

Although the entire body of a National Park or Monument should be considered for all time a protected primitive area, nevertheless there are roads, camping areas, and other portions developed for human conveniences. Likewise fishing and some scientific collecting are permitted, and there are other forms of recreation for the attraction of visitors. Radiating in all directions from these developed areas and roads a certain amount of disturbance of natural biotic relations is bound to occur.

During the years 1932 to 1940 the Wildlife Division of the National Park Service had primary responsibility for setting up "research areas" in an attempt to insure that at least certain parts of a Park would be free even from these modifying conditions. The character of a "research area" is identical with that of a primitive area except that no fish culture is permitted within a permanent research area or within waters which would affect or modify the aquatic life within waters of a permanent research area. Their protection is complete except that trails and necessary fire protection devices may be constructed, and there may be some control over insect infestations. Generally they are not accessible to the general public because they cannot be reached by road. A research area, however, is not closed to anyone who wishes to expend the necessary effort to get into it. Establishment of research areas does not affect in any way the amount of protection given the rest of the park. In fact, research areas are relatively of such small size that to insure proper representation of the large roaming animals they require absolute protection of all species over the entire park.

The research areas which have been established are truly pristine except in certain cases where the original condition has been affected through natural causes. For instance, the biotic succession area in the Texas Creek Section of the Great Smoky Mountains National Park has been modified by several old burns and by chestnut blight. The Gregory Bald area in the same park may possibly have originated through actions of man, but this is not known with any certainty.

Most of the research areas were selected by the Wildlife Division of the National Park Service in collaboration with park naturalists, with other branches of the National Park Service, and with the administrative officers concerned. The areas so chosen have been designated on the master plans of the respective parks and approved by the Director. Control of the areas is under the superintendents of the respective parks. Qualified research students may obtain access to the areas for any type of research that does not necessitate modification of

the environment by application to the superintendent of the park.

Twenty-eight research areas have been established in ten National Parks. Following is a list and brief description of these areas. In describing the vegetative types, terms commonly employed by foresters are used, as very little work has so far been done in analyzing the biotic communities. Areas indicated as "Barren" are those having less than twenty per cent of their surface covered with vegetation. The Committee is under obligations to Victor H. Cahalane, in charge of Section on National Park Wildlife in the Fish and Wildlife Service, for the description of these areas and for most of the information contained in this report.

GLACIER NATIONAL PARK

1. About 24,000 acres including many state lands on Flathead River between Quartz Creek and Camas Creek. Mostly Lodgepole and Larch-Douglas Fir with some Ponderosa Pine, Woodland-Herbaceous (Black Cottonwood and *Salix* sp.), Chaparral, and Grass-Herbaceous. Altitude 3400 to 5000 feet.

2. A triangular area at junction of Flathead River and Coal Creek, about 6000 acres. Mostly Lodgepole, Larch, Larch-Douglas Fir, and Spruce (*engelmannii*); altitude about 3600-5900 feet.

3. Area extending all around Quartz Lake and up to Continental Divide, about 21,000 acres, chiefly Barren; with Spruce, Douglas Fir, Larch-Douglas Fir, and Fir (*lasiocarpa*) at lower altitude near Lake. Altitude 4400-9800 feet.

4. Area on headwaters of Coal and Pinchot Creeks, about 32,000 acres. Much Barren, Sub-Alpine (*Pinus monticola*, *Abies lasiocarpa*, etc.), White Pine; Grass-Herbaceous (bear grass, rush, red heather, various grasses, etc.). Other types are Fir, Chaparral, Douglas Fir, Spruce. All type areas are small and jumbled up. Altitude about 4500-10,000 feet.

GRAND CANYON NATIONAL PARK

5. Great Thumb: Approximately 3000 acres, embracing all of Great Thumb Mesa, altitudes from 6000 to 6755 feet, Pinyon-Juniper type.

GREAT SMOKY MOUNTAINS NATIONAL PARK

6. Watersheds of Raven Fork in North Carolina, and of Chapman Prong, Buck Fork, and Eagle Rocks Branch in Tennessee, 19,640 acres. Approximately 3000 to 6621 altitude. Chiefly Spruce, with Northern Hardwoods along stream beds and slopes, and small areas of Cove Hard-

woods at lowest levels, also a few Heath Balds and small Hemlock areas.

7. Biotic Succession Area. Gregory's Bald, approximately 75 acres. Chiefly Grassland with a border of Northern Hardwoods on north, and Oak-Chestnut on the south, rich in azaleas, blueberry, grasses, willow. Altitude approximately 4800-4948 feet.

8. Biotic Succession Area. Probably the largest stand of dead mature chestnut in the Park, between Indian Camp Creek, Texas Creek, the Pinnacle Lead and the Park Line, approximately 3800 acres. Altitude approximately 2000-6300 feet. Comprises a complex of several vegetative cover types, conforming in a general way to varying altitudinal limits in drainage basins. Spruce on highest ridges, and Oak-Chestnut on lower ridges. Lower parts of drainages are chiefly Cove Hardwoods, with Northern Hardwoods predominating in upper portions of valleys and slopes. Includes several old burns with reproduction 1-20 years old, also some Grassland, Yellow Pine Hardwoods, and Heath Balds. Also a limited amount of White Pine Hardwoods.

9. Biotic Succession Area. Small sphagnum bog of about two acres near one side of meadow at Bryson Place on Deep Creek. Altitude approximately 2500 feet.

LASSEN VOLCANIC NATIONAL PARK

10. Area along north boundary, north and east of Prospect Peak, containing 1440 acres. Yellow Pine-Jeffrey Pine, Yellow Pine-White Fir and Fir. Altitude approximately 5850 to 8342 feet.

11. Area on Lost Creek, northeast of Chaos Crags, approximately 1080 acres. Sugar Pine-Yellow Pine-White Fir and pure Pine. Altitude 5500 feet to approximately 7950 feet.

12. A strip $\frac{1}{4}$ mile wide and approximately 5 miles long from summit of White Mountain to Warner Valley Ranger Station on Hot Springs Creek. Alpine, Sub-alpine, White Pine-Hemlock, Fir, Lodgepole Pine, and Jeffrey Pine-Fir. Altitude 5550 to 8695 feet.

13. Biotic Succession Area. Embracing a portion of the Devastated Area on Hat Creek, approximately 4160 acres. Was entirely denuded by 1915 eruption, leaving a loose, rocky volcanic ash-and-rock covering. Altitude approximately 6100 to 7500 feet.

MOUNT RAINIER NATIONAL PARK

14. The entire northeast portion of the park east of Carbon Glacier and north of Yakima Park, approximately 38,000 acres, chiefly Hemlock and Fir types, but also extensive areas of Grassland (meadow), Douglas Fir, Barren, and Sub-Alpine (*Abies lasiocarpa*, *Pinus albicaulus*, *Cassiope mertensiana*, *Empetrum nigrum*, *Castilleja* sp., *Arctostaphylos nevadensis*, etc.). Altitude 2026 to 9000 feet.

15. Butter Creek drainage on south boundary, approximately 2000 acres. Chiefly Fir (*A. amabilis* with some Western Hemlock); but with considerable Hemlock, Douglas Fir, and Grassland (*Phyllodoce empetriformis* or red heather, *Castilleja* sp., *Aster* sp., grasses, etc.). Also some Cedar (*Chamaecyparis nootkatensis*), Chaparral (*Alnus viridis sinuata*, *Rhododendron albiflorum*, and *Sorbus occidentalis*), and Barren. Altitude 3400 to 6900 feet.

ROCKY MOUNTAIN NATIONAL PARK

16. A large area in north end of park, bounded on north by Mt. Dickenson, Mt. Dunraven, and Cascade-Hogue Creek Divide, on west by Poudre River and Chapin Creek, on south by Mummy Range and on east by park boundary. Approximately 20,000 acres. Contains considerable Barren and Alpine (*Carex*, grasses, and herbaceous plants), Sub-Alpine (*Salix*, *Picea engelmannii* and *Abies lasiocarpa*); also some White Pine type (*P. flexilis*), Meadow, Spruce (*P. engelmannii* and *P. pungens*), Pine-Fir (*P. contorta*, *A. lasiocarpa*), and Lodgepole Pine (*P. contorta*), altitude approximately 8000 to 13,562 feet.

SEQUOIA NATIONAL PARK

(vegetative types not yet completely mapped)

17. Area of approximately 14,750 acres bounded on the north by Middle Fork of the Kaweah and on south by Paradise Ridge, altitude from 3000 to 9370 feet.

18. That portion of the drainage of the South Fork of the Kaweah lying immediately west of Sand Meadows, about 9600 acres, altitude 4500 to 9005 feet.

19. Area of approximately 13,500 acres in headwaters of Kern River, bounded on north by Kern-Kaweah River, southwest by Kaweah Peaks Ridge, and east by Kern River, altitude from 7500 to 13,816 feet.

20. Granite Creek drainage, on headwaters of Middle Fork of Kaweah River, approximately 4500 acres. Altitude 6000 to 12,263 feet.

YELLOWSTONE NATIONAL PARK

21. White-Tern-Fern-Wapiti Lakes. Area embracing and surrounding all these lakes, approximately 8400 acres; altitude approximately 8200 to 8700 feet. Chiefly Mixed Forest Type (Lodgepole Pine, Engelmann Spruce, Balsam Fir, and White-bark Pine), with some Grassland, some pure stand of Lodgepole and considerable areas of young Lodgepole Reproduction.

22. Specimen Ridge Fossil Forest, northeast slope of Specimen Ridge between Crystal Creek

and Chalcedony Creeks, approximately 8900 acres. Altitude approximately 6000 to 9400 feet. Chiefly Grassland, Grassland-Yellow Brush (presumably *Chrysothamnus*), and Mixed Lodgepole Pine-Balsam Fir; also some Sub-Alpine, and Barren, as well as small areas of other types.

23. Specimen Creek-Bighorn Peak Fossil Forest. Exact area and location not delineated on master plan for 1940, but includes fossil beds from lower Specimen Creek to Bighorn Peak, 7200 acres. Altitude approximately 7000 to 10,200 feet. Most of it is a mixed forest type consisting chiefly of Lodgepole Pine, Engelmann Spruce, Douglas Fir, and Balsam Fir. There are also extensive Grassland and Barren areas.

YOSEMITE NATIONAL PARK

24. Swamp Lake. Area of approximately 9400 acres, embracing north-west slopes of Tuolumne Canyon below Hetch Hetchy Dam, and adjacent high-lands around Swamp Lake, altitude 3500–5700 feet. Chiefly Pine (*P. ponderosa* and *jeffreyi*) at higher altitudes, with a few small meadows; canyon is almost all Woodland-Chaparral, over half of this being Semi-Barren (*Quercus chrysolepis*, *Ceanothus cuneatus*, *Pinus sabiniana*, and *Arctostaphylos mariposa*). Some pure stands of *Quercus chrysolepis*.

25. Boundary Hill. Area of approximately 16,000 acres, north of Yosemite Valley and west of Yosemite Creek, bounded on the south by the El Capitan Trail, on the east by the Hetch Hetchy-Yosemite Trail, on the north by Tioga Road and north boundary of Sections 22 and

23, T1SR21E, and on the west by west boundary of Sections 22, 27, and 34, and by Cascade Creek. Altitude 6000–9202 feet. Chiefly Lodgepole Pine-White Pine-Hemlock, and Fir (*Abies magnifica*). Also some Pine-Fir (*P. jeffreyi* and *lambertiana*) and *Abies concolor* and *magnifica*.

26. White Mountain. Area of approximately 4000 acres between Tuolumne Meadows and White Mountain including the following Sections in T1NR24E; all of Sections 14, 23, 24, 25, and 26; and the portions of Sections 2, 11, and 13 lying within the Park. Altitude 9700–12,556 feet. Chiefly Barren, Sub-Alpine (*Pinus albicaulus*), and Meadow; with Lodgepole Pine at lower altitudes.

ZION NATIONAL PARK

27. Bighorn Area. Approximately 5760 acres between Mt. Carmel Highway and Parunuweap Canyon, extending from Johnson Mountain on west to within about 1¼ miles of east boundary. Practically all is Ponderosa Pine Type, classed as semi-Barren (20–50% barren of cover).

28. West Rim-Phantom Valley. Approximately 15,360 acres bounded on west by west boundary, on south by north rim of Coalpits Wash, and on north and east by the west rim. About equally divided between Barren, Semi-Barren, Ponderosa Pine, and Pinyon-Juniper (*Pinus edulis* and *P. monophylla*, and *Juniperus scopulorum* and a little *J. utahensis*). Altitude 4300 to 7410 feet.

S. CHARLES KENDEIGH,
Chairman, Committee for
the Study of Plant and
Animal Communities

CONSERVATION OF SCHOLARLY JOURNALS

The American Library Association created this last year the Committee on Aid to Libraries in War Areas, headed by John R. Russell, the Librarian of the University of Rochester. The Committee is faced with numerous serious problems and hopes that American scholars and scientists will be of considerable aid in the solution of one of these problems.

One of the most difficult tasks in library reconstruction after the first World War was that of completing foreign institutional sets of American scholarly, scientific, and technical periodicals. The attempt to avoid a duplication of that situation is now the concern of the Committee.

Many sets of journals will be broken by the financial inability of the institutions to renew subscriptions. As far as possible they will be

completed from a stock of periodicals being purchased by the Committee. Many more will have been broken through mail difficulties and loss of shipments, while still other sets will have disappeared in the destruction of libraries. The size of the eventual demand is impossible to estimate, but requests received by the Committee already give evidence that it will be enormous.

With an imminent paper shortage attempts are being made to collect old periodicals for pulp. Fearing this possible reduction in the already limited supply of scholarly and scientific journals, the Committee hopes to enlist the co-operation of subscribers to this journal in preventing the sacrifice of this type of material to the pulp demand. It is scarcely necessary to mention the appreciation of foreign institutions and scholars for this activity.

Questions concerning the project or concern-