Recommendations for future work in the Lamar Horseshoe and along the Yellowstone River to the Gardiner area are listed:

1. Reread grassland quadrats and line transects at 5-10 year intervals.

2. Reread only "outside" aspen, willow and sage belt transects at 2-5 year intervals. Trend inside the exclosures on these species is already well established.

3. Use denuded areas inside exclosures for a plant-succession study. One plot of this type is located about 40 feet south of 0'.0" stake of the C_1-T_2 inside transect on the older (1958) elk exclosure. Soil is sandy-loam and erosion pavement. Bare area is about 15'x 6! Invading plants now present are _Camelina microcarpa_, _Agropyron spicatum_, _Erigeron corymbosus_, _Sedum stenopetalum_, _Astragalus miser_.

4. Establish study on wildlife summer range to see if this high altitude is as good as previously assumed.

5. Check source of heavy sheet erosion along Cache and Miller Creeks.

6. In future studies allow two weeks at the culmination of study for analysis of vegetation trends.

Worked with William Barmore, Assistant Management Biologist, Yellowstone National Park, on this project.
Supported by a grant from Yellowstone National Park.

Limnological Studies on Swan Lake and Third Creek

L. Floyd Clarke and George T. Baxter
University of Wyoming
Project Numbers 74 and 108

The most significant new research done on the Third Creek study involved a detailed study of the insect fauna. Dr. Gordon Edwards assisted in this study and was responsible for the classification of these insects. A summary of this work appears elsewhere in this report under his project.

In connection with the age-growth study of brook trout in the beaver ponds of Third Creek, 110 brook trout were collected, lengths and weights taken, scale samples collected, and stomachs preserved for future study. Re-examination of the ecology of the five study Stations on Third Creek was carried out. During the summer of 1961 three Stations, I, IV, and V were stocked with 930 fingerling brook trout each. None of these Stations had trout in them previously. These three Stations were examined during the 1962 summer season and no fish were recovered from any of the three Stations, suggesting that they are unable to support a brook trout population. Up to the present time the reason for this inability to support brook trout has not been definitely determined, however, since all other factors are quite comparable to ponds in which brook trout are present, it is suspected that the lack of O_2 during winter months when these ponds are frozen over could be responsible. Oxygen determinations during the winter months will be necessary in order to determine this.

Studies were continued on a restricted basis on the ecology of Swan Lake. General ecological conditions were noted and plankton and bottom samples collected. These studies will be compared with studies from previous summers to determine what important changes were taking place in the Lake as a result of the continuous addition of the effluent from the Colter Bay sewage. It is quite evident from the studies made up to this point that the Lake is serving effectively as a sewage lagoon. Undoubtedly the use of the Lake for this purpose only during the summer months with approximately a nine months period for recovery each year allows it to recover so that the rate of deterioration is not rapid.

Supported by the University of Wyoming.

Some Aspects of Plant and Animal Distribution as Affected by Geologic Formations

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University of Wyoming
Project Number 112

Research carried on in the summer of 1962 was a continuation of a three year study initiated in 1961. The study will attempt to evaluate and correlate quantitative and qualitative differences of various plant and animal populations occurring on five different geological formations. Study areas were located in Yellowstone National Park on Pitchstone Plateau, 8,800 feet, and on Two Ocean Plateau, 9,200 feet. In the Teton National Forest study areas were located on Big Game Ridge, 9,400 feet, and on Huckleberry Ridge, 9,200 feet. The Moran study area, 6,800 feet, was located in Grand Teton National Park, adjacent to the Biological Research Station. Geological formations represented by these study areas are Middle Pliocene pitchstone or rhyolitic glass; Oligocene pyroclastic andesitic conglomerate from the Wiggins formation; Cretaceous freshwater sedimentary sequence of sandstones, conglomerates, claystones and shales from the Harebell formation; Late Jurassic marine sandstone sediments from the Sundance formation; and sediments of fluvial and glacial origin, respectively.

Field work on the subalpine meadow study areas did not commence until the middle of July because of a late snow melt. From the middle of July until Labor Day a total of 71 mountain pocket gophers (*Thomomys talpoides*) were collected and frozen for analytical work. Measurements were taken of burrow cross sections on each area. The flowers, stems and leaves and roots of *Agoseris*, *Lupinus*, *Achillea*, and *Erigeron* were collected and frozen for analytical work. Ectoparasites were collected from each specimen. Two quart soil samples were taken at each area for use in quantitative and qualitative plant growth studies in plant growth chambers. A count of new pocket gopher mound diggings was made on each study area in late August to develop a comparative pocket gopher density index.