

VERTEBRATE INVENTORY FOR BIGHORN CANYON
NATIONAL RECREATION AREA

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Objectives

The study is designed to inventory vertebrates in Bighorn Canyon National Recreation Area using standardized censusing techniques and field observation. Locations, numbers, status, and habitat associations will be determined.

- Objective 1: Identify major vegetation and aquatic habitat types in the Recreation Area.
- Objective 2A: Determine avian species composition, distribution, status, and habitat associations in the Recreation Area.
- Objective 2B: Determine mammalian species composition, distribution, status, and habitat associations.
- Objective 2C: Determine fish species composition, distribution, status, and habitat associations.
- Objective 2D: Determine species composition, distribution, relative abundance, and habitat associations for reptiles and amphibians in the Recreation Area.

Methods

Vegetation and aquatic habitat types that are readily accessible will be cover mapped on USGS 7.5 quadrangle maps during the first 2 weeks of the study. The predominate 2-3 species of vegetation will be identified and classified. Wetlands will be classified. Emergent-submergent vegetation, substrate, water regime, and other wetland modifiers will be used to classify wetlands. Once habitats are mapped, transects and other sampling points will be marked on USGS 7.5 quadrangle maps and provided as appendices in the final report.

Birds will be surveyed using modified versions of standard techniques. In areas that are cover mapped, twelve 1000 m transects will be established representing all habitat types. Twenty points will also be marked in remote areas and in areas where there appears to be unique habitat types such as apparent feeding or watering areas. Transects will be monitored at least once each week prior to 1000 hours while point locations will be monitored at least 4 times during the field season for 15 minutes each prior to 1000 hours.

For both point locations and transects, each species observed or heard will be

identified and recorded. When appropriate, observed behavior, numbers, ages, and the predominate 3-4 species of vegetation within a 30 m radius of the observation point will be identified and percent ground cover of each species estimated. Habitat structures such as tree snags and cliffs will also be recorded.

Twenty small mammal traplines 100 m in length will be established in all habitat types. These transects will be located near bird transects and point locations to reduce travel. Three snap traps will be placed at 10 m intervals. One rat trap and 1 museum special will be baited with rolled oats and peanut butter and one museum special will be baited with pork trimmings. Each transect will be monitored twice each month during the field season. Skins and skulls will be preserved and made available to the University of Wyoming Museum.

Mist nets will be employed to survey bats in the area. Netting will be conducted in likely foraging areas such as riparian or marshy habitats. It may also be feasible to net bats by setting nets near an artificial light source that attracts moths (Lepidoptera) and other Insecta. Bats will be identified, photographed, and released.

In roaded areas, spot-lighting will be used to inventory other mammals. Road transects will be located on both the north and south ends of the recreation area. Species will be identified, and locations, activity, and associated habitat recorded.

Fish will be sampled from an array of available habitat types. The habitat types will be categorized generally as headwater stream, reservoir, tailwater, and tributary streams. The habitats will be described using standard techniques and a series of environmental variables will be measured at each sampling site (water temperature, turbidity, current velocity, water depth, and substrate). Sampling will be conducted at several sites within each habitat type to determine the species present, relative abundance and length-frequency distributions. The locations of capture of each species will be precisely documented and reference specimens of each species will be deposited in a museum. Species composition and relative abundance will be statistically related to habitat type and measured environmental variables.

Due to the diversity of habitat types, several fish sampling techniques will be utilized. Electrofishing gear and seines will be employed in streams. The total length of all fish will be measured as an index of population structure. Fish will be released unless seriously injured by the sampling gear.

Several standard methods of herptile sampling are available. Those that will be employed include: 1) baited minnow traps for aquatic-phase amphibians and small turtles, 2) drift fences with can traps for terrestrial-phase amphibians, certain turtles, and small snakes, 3) noosing for lizards, 4) standard fish traps for larger aquatic-phase turtles, and 5) hand capture of larger snakes near den entrances.

Results

Field work for 1984 was conducted between 4 May and 26 July and between 3

September and 23 September. The following objectives were addressed:

1. Describe general habitat types in the Recreation Area.
- 2 A & B. Determine birds and mammals inhabiting the Recreation Area relative to their status, relative abundance, and general habitat associations.

Terrestrial habitats in the area were classified using habitat descriptions outlined by the Wyoming Game and Fish Department's Wildlife Observation System. Wetland habitat types were classified. Characteristics of vegetation in transects were further described by randomly sampling 0.1 acre circular plots. Canopy cover, ground cover, stem density and species of shrubs, tree density and basal area by size class and species (James and Shugart 1970), soil type, moisture, and texture were determined for each transect.

Birds were surveyed using incidental observations, time-area counts, and transects. Time-area counts were used to survey wetland types while 500 m or 1000 m transects were used to survey terrestrial habitats. Mammals were surveyed using incidental observations, scent stations, tracks, and scats. Snap and pit traps were also set along 100-200 m of transects used to survey birds or within 10 m of shore of a wetland. Bats were captured using mist nets set over ponds. Herps and fish encountered were usually noted to location and habitat type of the location. Species that occur in the area rarely or only during winter were documented using the BHCNRA Wildlife Observation File and vertebrate survey data from the WGFD'S Yellow-tail Wildlife Management Unit.

Fifteen terrestrial habitat types and 3 major wetland types were identified for vertebrate surveys. These habitats were surveyed using 24 transects in the terrestrial areas and 7 time-area count plots near wetlands.

Preliminary results indicate that a large diversity of vertebrates occupy BHCNRA. Birds associated with western coniferous forests, sagebrush grassland, tall-grass prairie, as well as eastern deciduous forest were found nesting in the area. Mammals were generally indicative of those found in dry, sagebrush habitats with some species being closely associated with riparian vegetation.

Totals of 216 species of birds and 42 species of mammals were observed or captured during surveys. Five species of birds including red-breasted merganser (Mergus serrator), northern phalarope (Lobipes lobatus), Forester's tern (Sterna forsteri), solitary vireo (Vireo solitarius), and water pipits (Anthus spinoletta) were observed but were previously not documented as occurring in the latilong. A Merriam's shrew (Sorex merriami) was captured which has been collected in a few, widespread locations in both Montana and Wyoming. BCNRA's wildlife observation files had documentation of 2 spotted bats (Euderma maculatum), 1 in Wyoming and 1 in Montana. These rare bats were previously documented for Wyoming and Montana by 1 record in each state.

Data analyses from the 1984 field season continue. The report for the 1984 portion of the vertebrate survey will be completed during March 1985.

Conclusions

A total of 216 species of birds and 42 species of mammals are known to occur in the Bighorn Canyon Recreation Area. Several of these species are relatively unique and not common in Wyoming and Montana.