FEDERAL AID
ANNUAL RESEARCH PERFORMANCE REPORT

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 25526
Juneau, AK 99802-5526

PROJECT TITLE: Habitat use, foraging behavior, and nutritional ecology of Nelchina caribou

PRINCIPAL INVESTIGATOR: William B. Collins

COOPERATORS: None

FEDERAL AID GRANT PROGRAM: Wildlife Restoration

GRANT AND SEGMENT NR.: W-27-5

PROJECT NR.: 3.47

WORK LOCATION: Units 12, 13, and 20 E

STATE: Alaska

PERIOD: 1 July 2001 – 30 June 2002

I. PROGRESS ON PROJECT OBJECTIVES

OBJECTIVE 1: Lichen availability does not increase in linear manner relative to stand age.

I have measured lichen availability and corresponding stand age at approximately 340 sites in the Copper River Basin and in Unit 20 E. Data analysis is not complete, but lichen availability apparently does not increase linearly relative to stand age.

OBJECTIVE 2: In winter, Nelchina caribou habitat preference is not affected by lichen availability.

I have measured lichen availability at 100 sites in the Copper River Basin and at 240 sites in Unit 20 E. Half of these sites represent points selected by radiocollared caribou, and the other half of the sites represents random points. I have not analyzed the data.

OBJECTIVE 3: Digestible energy intake, and digestive efficiency, including digestibility, rumen turnover and total passage rates of caribou are not favored by high lichen availability.

Digestibility of individual forages, rumen turnover, and total passage rates have been determined for 6 tractable caribou in paddocks of 5 different levels of lichen availability. Data have not been analyzed.

OBJECTIVE 4: Forage lichen establishment and growth are not affected by substrate.

Work regarding this hypothesis is in progress, but I am concerned that treatments established to measure the effects of substrate have been too severely disturbed by natural forces to allow meaningful assessment.

OBJECTIVE 5: Branching of *Cladina* species is not indicative of lichen age.

Work regarding this hypothesis is in progress. Conclusions will be based on 6 years of observation.

OBJECTIVE 6: Summer forage quality is not enhanced by fire.

No work was done on this objective during this period.

II. SUMMARY OF WORK COMPLETED ON JOBS IDENTIFIED IN ANNUAL PLAN THIS PERIOD

JOB 1: Lichen cover and biomass

Lichen cover and biomass were sampled at 50 caribou locations and at 50 random locations in the Copper River Basin. Forage lichen biomass in either type of location was limited relative to that found in similar areas in Unit 20 E. Most forage lichens were short in stature, and, typically, thalli were vertically oriented only for the last 3 to 5 years of growth. These observations were indicative of heavy grazing prior to Nelchina caribou wintering north of the Alaska Range.

Job 2: Relationships of lichen to stand age, topography

I did not find any apparent relationship between percent lichen cover and biomass versus stand age in the Copper River Basin in 2001, probably because widespread heavy grazing had occurred. However, as in Unit 20 E, forage species were generally absent in stands less than 50 to 60 years old. *Cladina rangiferina*, one of the most preferred forage species, was not relatively abundant in stands less than 100 to 120 years. Stand ages in Units 13 and 20 E were similar, both following a bimodal distribution that peaked approximately 80 and 160 years ago. No clear relationships of lichen cover or biomass to stand age have been determined.

Job 3: Diet versus lichen availability

Six tractable caribou, 3 of which were rumen fistulated, were grazed for periods of 1 week each in paddocks containing 0, 13, 26, 42, and 56 percent cover by forage lichens. Rumen contents and feces were collected in each treatment and will be analyzed for diet composition.

JOB 4: Rumen turnover and total passage rates

A cobalt marker was administered to caribou used in Job 3 to assess rumen turnover and total passage rates. I have begun but not completed laboratory analyses of feces and rumen contents.

JOB 5: Activity budgets

Activity budgets were determined for each of the tractable animals in each of the paddocks described above. Preliminary analyses indicate the percentage of non-grazing activity characterized by rumenation increased with decreasing lichen availability.

JOB 6: Caribou condition relative to diet, activity, rumen turnover and total passage rates

Caribou condition relative to lichen availability, rumen turnover and total passage rates was sampled by weighing the tractable animals following each paddock treatment. The data have not been analyzed.

JOB 7: Nelchina range stations

Most Nelchina range stations were sampled in late August 2001. The remainder was sampled in late August 2002. Approximately 1/3 of the exclosures were destroyed or had missing stakes. Approximately 1/3 of exclosures were in poor condition and were repaired to one degree or another. I have not yet summarized the data.

JOB 8: Thallus branching

Approximately 100 individuals of each of 4 principal forage lichen species were marked for determination of branching frequency. Branching will be determined every 2 years, until 6 years following marking.

JOB 9: Lichen response to substrate

Plots established in 2001 to determine the effects of different substrates on development of specific lichen fragments received unexpected amounts of disturbance and disarrangement of test fragments. Raindrop impact appeared to be the primary force responsible for redistributing fragments relative to substrate treatments. At this point, I am not confident I will be able to conclude anything from these treatments.

JOB 10: Nelchina summer forages

Nothing was done on this job because I ran out of time.

JOB 11: In vivo digestibilities

In vivo digestibilities of the 14 principal forage items found in winter caribou diets were determined by the nylon-bag technique. Laboratory analyses have been completed, but data have not been summarized.

JOB 12: Report writing

This is the only report that has been written regarding this work.

III. ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE THAT WAS ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT PERIOD

None

IV. PUBLICATIONS None

V. RECOMMENDATIONS FOR THIS PROJECT None at this time

VI. APPENDIX None

VII. PROJECT COSTS FOR THIS SEGMENT PERIOD

FEDERAL AID SHARE $ 16,418__ STATE SHARE $ 5,473_ = TOTAL $21,891__

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APPROVAL DATE: 9/25/12