

Spring and Summer Food Habits of Black Bears in the Pelly River Valley, Yukon

Abstract

Food habits of black bears (*Ursus americanus*) from the Pelly River Valley, Yukon, were examined to determine the seasonal importance of various foods for bears inhabiting a northern environment. Food habits were determined by analysis of 59 scats and one stomach. Herbaceous material and berries accounted for 95 percent of the scat volume during spring and summer. Horsetail (*Equisetum spp.*), bearberry (*Arctostaphylos uva-ursi*), soapberry (*Sheperdia canadensis*), and graminoids were the most important foods. Overwintered berries were eaten early in spring until herbaceous vegetation became available. New berries were important from mid to late-summer. Insects, particularly ants, were frequent in scats from May to August, but were only two percent of the total diet volume. Seasonal food habit information is important because it reflects seasonal trends in black bear habitat use. Food habit preferences of bears in northern environments are generally similar to those in southern areas; however the restricted availability of different foods limits diversity in northern diets.

Introduction

Food habit studies provide information about the relative importance of different foods to an animal's diet. For black bears (*Ursus americanus*), this information is important to understand their life history and help investigators assess the seasonal importance of different habitats. Habitat use has been shown to vary with the availability, distribution and abundance of preferred foods (Hatler 1967, Jonkel and Cowan 1971) and changes in the seasonal use of plant and animal foods by black bears is common (Penner *et al.* 1980). There is little information on the food habits of northern black bears (Hatler 1972). Information on the ecology of northern black bears is important for their effective management, particularly under the increasing encroachment of human development.

Food habit information was obtained in 1984 for black bears inhabiting the Pelly River Valley near Ross River, Yukon. My objectives were to determine the seasonal importance of various foods in the diet of black bears inhabiting a northern environment and to compare the diet of northern black bears with those in other areas.

Study Area

The study area is located along the Pelly River Valley (62°00' N, 133°30' W) and is representative of major river valleys in the southern Yukon. The area is traversed by the Robert Campbell Highway running east to west along the Pelly River, and the Canol Highway running

north along the Ross River and south along the Lapie River. The town of Ross River is located on the Canol Highway at the confluence of the Ross and Pelly Rivers.

The study area lies within the Pelly River Ecoregion (Oswald and Senyk 1977). It has mean annual temperatures ranging from -4°C to -7°C, with mean January temperatures of -27°C to -35°C and mean July temperatures of 13°C to 15°C. Valley bottoms have mean annual precipitation of between 250 and 300 mm.

The Pelly River Valley is dominated by white spruce (*Picea glauca*) forest on dry sites and black spruce (*Picea mariana*) forest on wetter sites. In white spruce forest, shaded sites are sparsely vegetated with mosses, horsetails (*Equisetum spp.*), and rose (*Rosa acicularis*). Where the canopy is open, willows (*Salix spp.*) are prevalent and there is a greater abundance of herbaceous vegetation. In black spruce forest there is moss ground cover with dense willows and ericaceous shrubs where the canopy is open. Steep south facing slopes rise several hundred feet above the Pelly River and are dominated by sagewort (*Artemisia spp.*) grassland. Aspen (*Populus tremuloides*) occurs in gullies that drain these hillsides. Aspen forest also occurs in burned over sites that are common in the southern portion of the study area.

Deciduous trees and shrubs on the study area flush by the end of May. Arctic lupine (*Lupinus arcticus*) is the first plant to flower in the spring followed by other perennials, vetch (*Astragalus*

spp.), locoweed (*Oxytropis spp.*), and lousewort (*Pedicularis spp.*). Major annuals such as horsetail appear in early to mid-June. Most plant species have flowered by the end of June. Frost occurs in mid-August which initiates the end of the growing season.

Methods

Scats from black bears were collected between 15 May and 20 August, 1984. All scats were labelled with date of collection and remarks on probable age. Scats were frozen until analysis in August of 1984 and 1985.

Scats were thawed and washed on a No. 18 sieve to remove fines. Sieve contents were mixed with water and distributed evenly in an enamel pan. A random 10 ml sample was removed from the pan, mixed with 30 ml of water, then put into a square petri dish and spread over a 25 square grid (i.e. each square = 4%). The percent volume of each item in the sample was estimated. Three to five samples were examined from each scat. Observations of feeding bears aided in the assessment of seasonal food habits.

Results and Discussion

The percent occurrence and average percent volume of identified contents were determined from 59 scats and one stomach (Table 1). Horsetail was the most frequent item in the samples and accounted for the greatest percent volume. Next in importance was bearberry (*Arctostaphylos uva-ursi*) fruit followed by soapberry (*Shepherdia canadensis*) fruit and graminoids. Animal matter, particularly ants and mammal hair, were frequently found in samples, but comprised a small percentage of the total volume.

To evaluate seasonal trends in food habits, collection dates were divided into two periods: spring, 28 May-30 June and summer, 1-30 July (Table 1). Only known aged scats ($\pm 1-2$ days) were used.

Bearberry fruits were common in the spring diet. In early May, 1984, many black bears were observed feeding on open south facing slopes above the floor of the Pelly River. They were likely feeding on overwintered bearberries and grasses because vernal growth did not occur on the slopes until late May. Graminoids and overwintered berries are common in the spring diet of black bears (McIlroy 1970, Jonkel and Cowan

TABLE 1. Percent occurrence (occ.) and mean percent volume (vol.) of food items in scat samples and one stomach from the Pelly River Valley, Yukon, 28 May-16 August, 1984.

Item	Spring 28 May- 30 June (n=17)		Summer 1 July- 30 July (n=31)		Total 28 May- 16 August (n=60)	
	Occ.	Vol.	Occ.	Vol.	Occ.	Vol.
Herbaceous material:						
<i>Equisetum sp.</i>	70.6	50.4	32.3	28.5	48.3	39.1
Grasses	23.5	0.9	22.6	0.4	21.7	2.3
Unidentified	5.9	0.7	6.5	2.4	5.0	1.4
Other	0.0	0.0	6.5	1.9	3.3	1.0
Fruits:						
<i>Arctostaphylos uva-ursi</i>	52.9	27.4	25.8	9.8	33.3	15.9
<i>Shepherdia canadensis</i>	0.0	0.0	51.6	39.2	31.7	20.5
<i>Vaccinium vitis-idaea</i>	23.5	3.8	3.2	0.1	8.3	1.1
<i>Vaccinium uliginosum</i>	17.6	5.8	3.2	0.0	8.3	1.8
<i>Vaccinium sp.</i>	11.8	2.6	3.2	0.4	6.7	1.7
<i>Empetrum nigrum</i>	5.9	5.9	12.9	6.3	15.0	7.6
<i>Fragaria virginiana</i>	0.0	0.0	9.7	2.4	5.0	1.3
Unidentified	5.9	1.0	0.0	0.0	6.7	1.2
Ants	11.8	0.0	6.5	3.3	28.3	1.7
Other Insects	23.5	1.1	45.2	0.6	10.0	0.4
Vertebrate remains:						
Feathers	0.0	0.0	3.2	0.2	1.7	0.1
Hair	5.9	0.0	22.6	0.4	16.7	0.3
Bone	0.0	0.0	3.2	0.1	1.7	0.1
Forest litter	47.1	0.4	38.7	4.0	33.3	2.5
TOTAL		100.0		100.0		100.0

1971, Hatler 1972, Modafferi 1982, Smith 1984, Herrero 1985). Black bears lose energy between den emergence and the ripening of nutritious fruits (Jonkel and Cowan 1971, Rogers 1976, Beeman and Pelton 1980). Bears use overwintered berries in the spring because they are high in carbohydrates and because suitable herbaceous vegetation has not yet emerged (Herrero 1985). In the Pelly River study area, bearberries were the most common fruit in scats collected in the spring but they were supplemented by blueberries, bog cranberries, and occasionally crowberries. By early June vernal growth had begun in the valley bottom and the use of open slopes declined; however some black bears were observed on open slopes until late-July. The

continued use of the slopes coincided with the presence of bearberry in scats until mid-July. Insects, particularly ants, were the most frequent animal food during June and July. Similar trends are reported elsewhere (Chatelain 1950, Tisch 1961, Hatler 1972, Nagy and Russell 1978). Horsetail increased in the diet in the spring and summer corresponding with black bear movement to the valley bottom. Horsetail is common in the spring diet of black bears elsewhere (McIlroy 1970, Hatler 1972, Nagy and Russell 1978).

After mid-summer, soapberries were a major food until frost occurred and berries began to fall off the plants. Crowberry fruit occurred more frequently in the black bear diet as the summer progressed. Crowberry fruit comprised 48 percent of the volume of one stomach collected on 13 August and 73 percent of the volume of a scat collected on 16 August. In other north temperate and boreal forest areas, blueberries are a critical black bear food in late summer and early fall (McIlroy 1970, Jonkel and Cowan 1971, Hatler 1972, Rogers 1976, Modafferi 1982). In the Pelly River study area, blueberries were only common in scats during the spring but likely became more prevalent in the diet in August after scat collection ceased. Blueberry and crowberry are scarce in the Pelly River Valley near Ross River, but are common in subalpine areas to the north and

south. I suspect black bears disperse to these areas in the late summer when blueberry and crowberry fruits ripen. Qualitative evaluations suggest 1984 was a moderate to poor year for blueberry and bearberry production.

The results of this study cover only one year of collection, so they do not take into account year-to-year fluctuations in the availability of important foods, particularly berries. The results are expected to reflect the general trend in black bear food habits, however. Food habits over the sampling period are consistent with those found in other studies. Herbaceous foods are used early in the summer, fruit is added as it becomes available and animals (usually insects) are used opportunistically during summer (Hatler 1972, Penner *et al.* 1980). Food preferences of black bears in northern habitats are generally similar to those in southern areas; however, the restricted availability of different foods limits diversity in northern diets.

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