

A PRELIMINARY SURVEY OF THE RATTLESNAKE (Crotalus viridis)
IN THE IDAHO PRIMITIVE AREA

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ABSTRACT

Thirty rattlesnakes collected along Big Creek and a portion of the middle fork of the Salmon River in the Idaho Primitive Area, indicate the presence of one subspecies (Crotalus viridis viridis). Rattlesnakes were encountered at low elevations in stable talus slopes. As mean daytime temperatures increased during the summer, rattlesnakes were encountered nearer to water. Specific details of preferred habitat are discussed. A distribution study proved difficult because of the rattlesnake's nocturnal habits during the summer.

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In the state of Idaho, three subspecies of rattlesnakes can be found: Crotalus viridis lutosus, C. V. oregonus, and C. V. viridis ((Klauber, 1972); Figure 1). This map suggests that 1-3 of these subspecies may be present in the Idaho Primitive Area (IPA). The study began on 20 May 1979 and continued through 20 August of that year. The overall goal of the investigation was to examine the ecology of rattlesnakes in a relatively undisturbed setting. Specific objectives included: (1) determination of subspecies and its distribution, (2) determination of summer habitat preference, and (3) collection of live specimens for further study.

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STUDY AREA

Most of my efforts were concentrated along the lower half of Big Creek and on a portion of the middle fork of the Salmon River (Figure 2). The Taylor Ranch, a University of Idaho Field Station, was used as a base of operations. Big Creek, from Crooked Creek to the mouth, is characterized by a high relief topography. Dry, southern exposures have numerous talus slopes and rocky outcrops with sparse vegetation except near water. Northern slopes are also rocky but support a denser, coniferous forest and

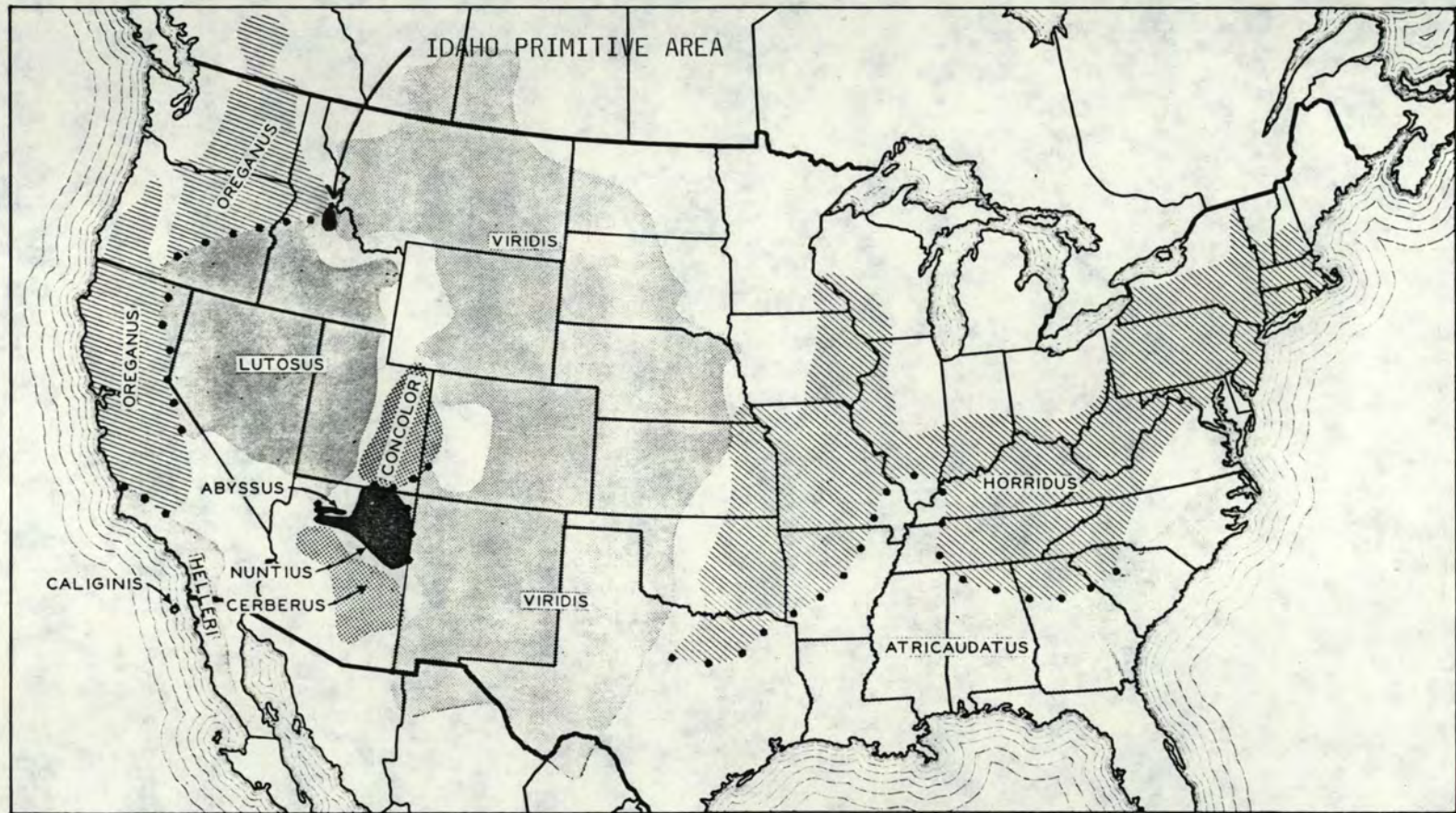


Figure 1. Ranges of *C. viridis viridis*, *C. V. lutosus*, and *C. V. oreganus* in relation to the Idaho Primitive Area (After Klauber, 1972)

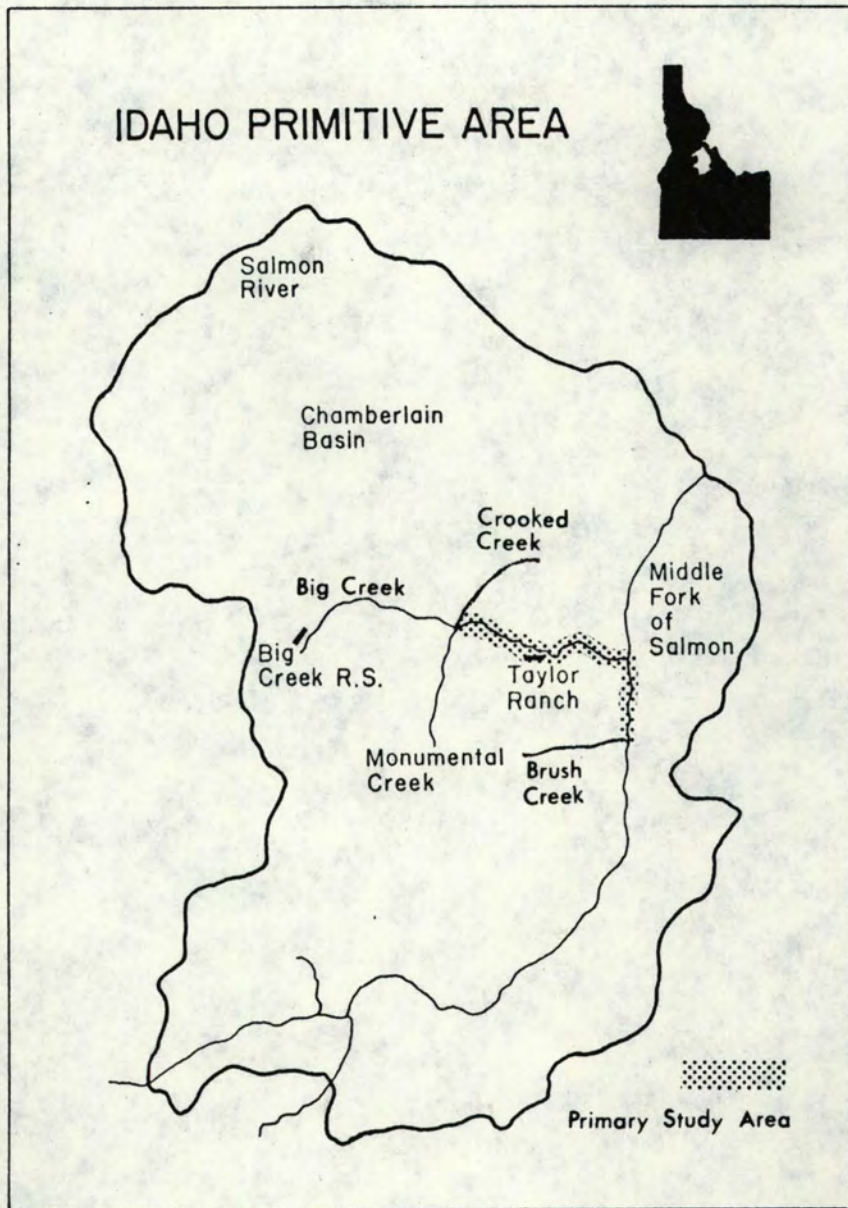


Figure 2. Rattlesnake study area in relation to the Idaho Primitive Area

deciduous understory, especially in side drainages. The area searched along the middle fork of the Salmon River also shows the same high relief as Big Creek with steep talus slopes often ending at the river. The rough terrain is again dry and open with areas of denser vegetation along the water's edge.

METHODS

I spent the majority of my time searching the open, talus slopes with much sun exposure because Klauber (1972) indicates rattlesnakes prefer this type of habitat. As the summer progressed and temperatures increased, areas near the water were searched more frequently. Klauber (1972) indicates that spring migration of rattlesnakes from the den is likely to be downhill to the valleys and rocky outcrops. The search was confined between the stream's edge and approximately 200 m up the adjacent slopes.

To locate rattlesnakes, I traversed the proper habitat until a snake was encountered. The rattlesnake was then captured with snake tongs and placed in a cloth sack. The location was recorded on a map and other measurements including the temperature of the snake's position, weather, time of day, and habitat conditions (slope, substrate, and aspect) were noted.

RESULTS

SUBSPECIES

Thirty rattlesnakes were encountered and twenty-three captured and examined. Only one subspecies was identified from those collected - the prairie rattlesnake (C. V. viridis; Klauber, 1972). Dr. Richard Wallace and Mr. Lowell Diller, Department of Biology, University of Idaho, concur that this is the only subspecies represented in the collection.

DISTRIBUTION

My conclusions concerning the distribution of rattlesnakes in the study area are based on personal observations and conversations with people who have spent time in the study area. Rattlesnakes that I personally encountered are plotted on Figure 3. Distributional information obtained from other people are summarized below by drainages.

Big Creek Drainage - Mr. Robert Gillihan, an outfitter and guide in the IPA, reports encountering only one rattlesnake above Crooked Creek in twenty-three years of traveling in the area. Between Crooked Creek and Coxey Hole, the only rattlesnakes he has seen have been at Acorn Creek. Mr. Gillihan reports that encounters with a rattlesnake are more and more likely as one moves downstream from Coxey Hole to Cabin Creek. My examinations of the area above Cabin Creek failed to encounter a rattlesnake. The Forest Service personnel at Cabin Creek have reported rattlesnakes on either side of the Cabin Creek meadow, in the rocky slides of Cave Creek (upstream from Cabin Creek), and in the rocky bluffs on the downstream side of the meadow. On the average they report encountering six rattlesnakes a year.

Along Big Creek, the heaviest population of rattlesnakes apparently occurs below Cabin Creek and extends to the middle fork. Mr. Gary Powers of the Idaho Department of Fish and Game reported encountering seven rattlesnakes between Cabin Creek and Cliff Creek last year. The majority of the snakes I observed were around Taylor Ranch and along Big Creek toward the middle fork. Mr. Roy Quigley, a visitor in the area for thirty years, reports the majority of the rattlesnakes he has seen are along Big Creek below Cabin Creek to the middle fork of the Salmon River.

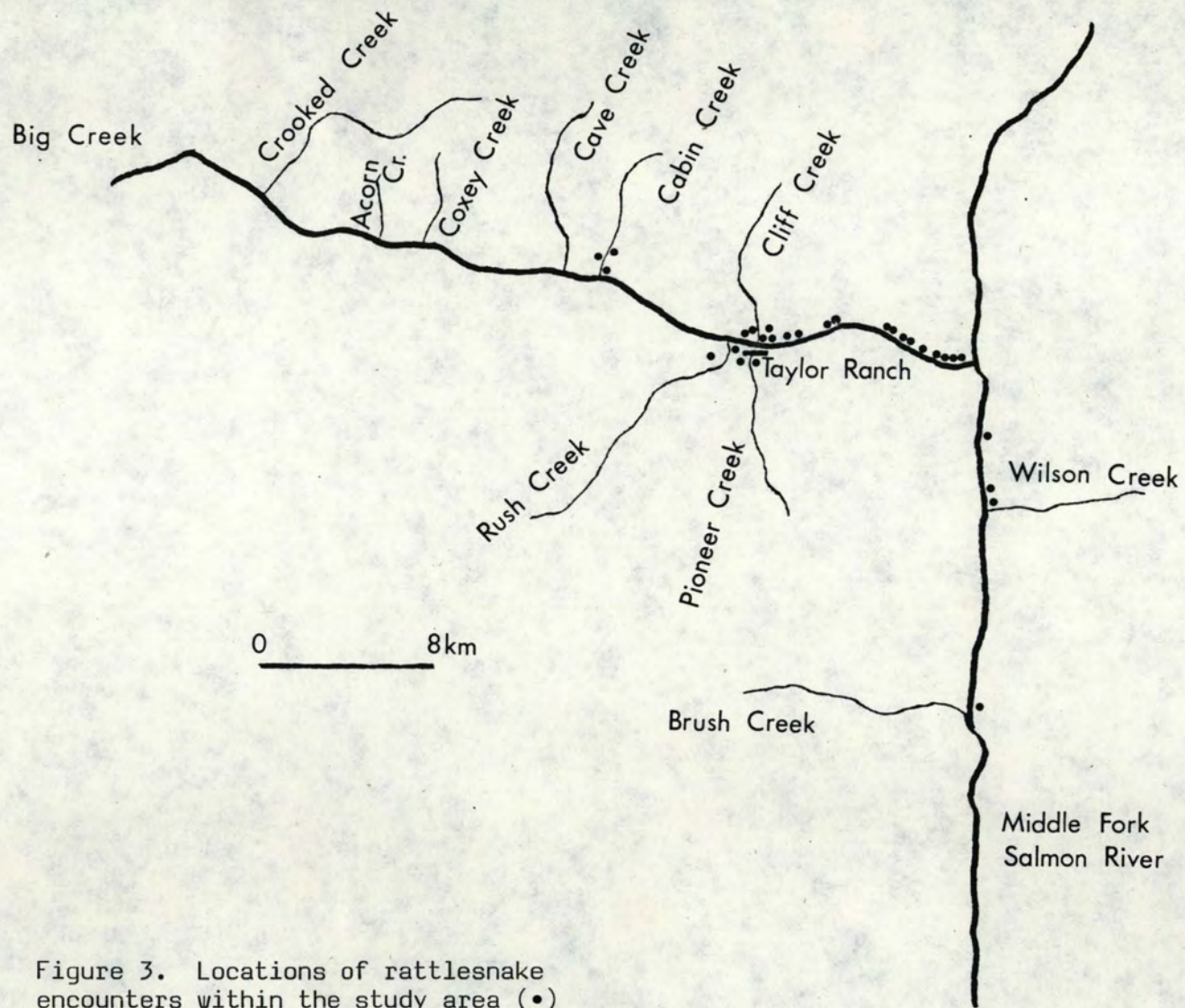


Figure 3. Locations of rattlesnake encounters within the study area (•)

Middle Fork of the Salmon River - Conversations with Mr. Quigley and Mr. John Hart, who have traveled the middle fork trail for the last twenty-five years, indicate the rattlesnake population is not as high as it used to be. These people indicated that 10-15 years ago one could expect to see one or two rattlesnakes each day during the summer but now only one or two snakes may be encountered the entire trip. At Brush Creek (the southern limits of the study area on the middle fork), the Flying B Ranch reported killing about 12 rattlesnakes last year and four snakes this year as of July 15th. Along the middle fork part of the study area, a Forest Service Boat Patrol reported seeing six rattlesnakes last year and only one this year as of July 13th. A river guide with 20 years experience on the middle fork, encounters most rattlesnakes below the mouth of Big Creek, especially near the main Salmon River.

SUMMER HABITAT

In early summer, when nighttime temperatures are relatively cool, rattlesnakes prefer open, rocky, southern exposed slopes. Rock slides in these areas must be stable. Generally this means one could walk on the rocks without having them slide out from underfoot. Also, the rocks were usually rounded but with edges that prevent rolling; lichens were often present on the rock's surface. Seventy percent of the rattlesnakes were encountered around rocks about the size of a basketball and no snakes were located among large (i.e. desk-size) boulders. Rattlesnakes appear to favor rock slides with some plant growth either at the base of the slide or scattered throughout the rocks. Plants such as chokecherry (Prunus virginiana), ninebark (Physocarpus malvaceous), and clumps of grasses (Agropyron and Poa spp.) were frequently encountered.

Rattlesnakes were consistently encountered in slides with a 20°-45° slope. As summer progressed and temperatures rose to 96°F in August, the snakes tended to move near to water at the base of the slides. The vegetation here was often thick and formed a shade canopy to cool surface temperatures. However, rock slides were usually close by and the rattlesnakes sought cover in them when disturbed.

Temperature and weather conditions are also important factors when examining summer habitat. Rattlesnakes will bask in sunlight at moderate temperatures but will die after a short period of direct exposure to sunlight at high temperatures. The optimum body temperature in rattlesnakes is between 80 -90°F. Depending on the air temperature, rattlesnakes will move in and out of the sun to achieve the optimum body temperature (Klauber, 1972). On hot, sunny days, almost all rattlesnakes encountered were under cover or in shade, and temperature recordings indicate the snakes were seeking an optimum temperature in these locations (Table 1). On overcast days, when temperatures were moderate, rattlesnakes were found most often in the open, away from cover. When the weather was partial overcast, rattlesnakes were frequently encountered in patches of sun.

DISCUSSION

It was hoped that more rattlesnakes could have been obtained but summer is not a favorable time to collect rattlesnakes. Rattlesnakes become more nocturnal during the summer even though daytime temperatures may be favorable (Klauber, 1972).

Several interesting observations were made concerning the preferred habitat of rattlesnakes in the IPA. The rock size where rattlesnakes were

Table 1. Number of rattlesnakes encountered on hot, sunny days and the relation between the temperature and their location

TEMPERATURE OF POSITION °F	LOCATION	
	IN SUN	IN SHADE
70-74	2	0
75-79	1	2
80-84	0	4
85-90	0	5

encountered was very uniform throughout the study area. The snakes may prefer the space between this size rock because it may allow for ease of travel or provide homes for prey items. Rattlesnakes were encountered consistently near rock slides with a substantial slope. Although steep slopes are characteristic of the study area, rocks piled in such a fashion may allow the snake to escape deep into the interior of the slide to not only escape predation but also to avoid extreme temperatures. On several occasions I encountered a rattlesnake but could not capture it because it went deep into the rock slide.

Figure 3 indicates a clumping of encounters with rattlesnakes around Taylor Ranch. This is because much of my time was spent there. Also, a significant habitat change is evident along Big Creek, especially near Crooked Creek. There, the slopes have a heavier forest canopy with a dense understory. This results in cooler surface temperatures which may not be preferred by snakes. This temperature regime does not exist in lower Big Creek. The extreme rough topography and few river crossings in the study area made it necessary to confine my search time along that side of the river with a trail. Approximately 50% of the rattlesnake encounters were along the trail which indicates the trail passes through preferred snake habitat, especially in the lower part of Big Creek.

Along the middle fork, the rattlesnake population appears to be declining. One reason for this may be the increase in river use by boaters. Seven thousand boaters floated the middle fork this summer and they all must camp at designated sites along the river. With this many people exploring each camp, an encounter with a rattlesnake is highly possible and more snakes may be killed than left alone. The Flying B Ranch appears to support

more snakes than the surrounding areas. The ranch is situated on a 300 acre bench along the middle fork and the land is intensively irrigated. The crops and hay produced may concentrate a rodent population that attracts rattlesnakes. The ranch also caters to a large number of summer guests (300+) and the chances of an encounter with a rattlesnake is also more likely with more people exploring the area.

There is still much work to be done with the rattlesnakes in the Idaho Primitive Area. Of primary interest would be to locate where the two subspecies (C. V. viridis and C. V. oregonus) intergrade. Perhaps this occurs along the main Salmon River. Secondly, the rattlesnakes around the Taylor Ranch could be studied further. Den ecology may be examined. It is possible to track snakes using a radio-active wire inserted in the tail. This may provide for an interesting study for daily and seasonal movements in the rattlesnake population.

REFERENCES

Klauber, L.M., 1972. Rattlesnakes: Their Habits, Life Histories and Influence on Mankind, University of California Press, L.A., 2 volumes, 1532 pp.