

CARNIVOR STUDY - ISLAND IN THE SKY DISTRICT

Line Description

Scent stations were set at a number of locations in the Island in the Sky District of Canyonlands National Park. These were either of the sifted soil or the sooted aluminum plate. See the Methods section for description of technique. Station line locations were selected to represent different habitats. The following is a list of the different scent station lines and the habitats that they represent. Refer to the Carnivore Study map for the exact locations of these numbered scent station lines. These lines were not photographed because the general location as described is adequate to set the station lines.

Line

- I1 Along the White Crack road just east of Junction Butte. Blackbrush (Coleogyne ramosissima), Mormon tea (Ephedra spp.), galleta (Hilaria jamesii) community.
- I2 Along the White Rim road where it curls around Gooseberry Canyon and near the South Fork of Buck Canyon. Galleta (Hilaria jamesii), Indian ricegrass (stipa hymenoides) community.
- I3 Along the Lathrop Canyon road starting from the White Rim and going all the way down to the river. This is mostly snakeweed, Mormon tea community with a little of saltbush (Atriplex canescens), cheatgrass (Bromus tectorum) community mixed in.
- I4 Upheaval Dome-Syncline Valley loop trail. Pinyon-juniper community.
- I5 Greys Pasture. Indian ricegrass (Stipa hymenoides), needle and thread (stipa comata), blue gamma (Bouteloua gracilis) community.
- I6 Murphy Trail and Willow Flats campground road. Pinyon-juniper community with some Indian ricegrass, needle and thread, blue gamma community.
- I7 Red Sea Canyon from the main road down to the pour off into Rough Canyon. pinyon-juniper community
- I8 Taylor Canyon from Upheaval Bottom to the campsite in Taylor Canyon. Saltbush, cheatgrass community.

CARNIVOR STUDY - NEEDLES DISTRICT

Line Description

The Needles District of Canyonlands National Park was surveyed from August 25, 1988 to August 30, 1988. Ground tracking was the main technique used because most of the areas of interest had a favorable substrate (moist sandy soil) due to the thunderstorms that frequent the area at that time of year. Sooted aluminum plates were used on only one line because of the constant threat of rain.

The following is a list of the areas surveyed (lines), and the habitat represented there. Refer to the Carnivore map for the exact locations.

Line

- N1 Horse Canyon, from where it intersects with Salt Creek all the way to Fortress Arch. Ground tracking was used as we moved up the creek in a vehicle. This area represents the sagebrush-saltbush community.
- N2 Squaw Canyon, from by the ranger residence area up to where the trail leaves for upper Lost Canyon. Ground tracking was used here. This is mostly a riparian saltcedar-willow community with some sagebrush-saltbush and pinyon-juniper.
- N3 Lower Salt Creek, from Cave Spring to Angel Arch. Ground tracking was used as we moved up the creek in a vehicle. The community here is mostly sagebrush-saltbush with a little pinyon-juniper up by Angel Arch.
- N4 The road from Lower Jump in Salt Creek out to the Colorado River Overlook. Sooted aluminum plates were used along this route. The area is a mixture of upland pinyon-juniper and terraced blackbrush-Mormon tea-galleta.
- N5 Upper Lost Canyon, from where the trail from Squaw Flat Campground meets the canyon all the way to the beginning. Ground tracking was used here. This is mainly a canyon pseudoriparian pinyon-juniper-cottonwood area.
- N6 Chesler Canyon, from where the road meets the Joint Trail all the way to the beginning of the canyon. Ground tracking was used here. This is mostly a canyon pinyon-juniper-cottonwood community with a small bit of galleta-Indian ricegrass near the Joint Trail.
- N7 Cyclone Canyon, from the intersection where the road forks off to the confluence overlook all the way to the end of the road. Ground tracking along the road was used. This is a graben galleta-Indian ricegrass area.
- N8 Upper Salt Creek, from the south border of the park to just past the Big Pocket. Ground tracking along the trail and down by the creek. This is mostly sagebrush and saltbush alluvial bench with some willow and tamarisk riparian zone.

Island in the Sky District Line Results

Line (Refer to Carnivore Map for line locations)

- I1 Sifted soil technique. Various rodent and squirrel tracks found. Coyote tracks were observed along the road.
- I2 Sifted soil technique. Squirrels, mice, ants, and rabbits.
- I3 Sooted aluminum plates. Lizards, insects, and rodents were observed on the plates. A grey fox was observed across the river from the Lathrop campsite. Numerous raccoon and deer tracks were found on the beach at the campsite. Four badger holes were sited along the line and two Cooper's Hawks were seen in the wash near the river. Two bighorn sheep were seen near station five.
- I4 Sooted aluminum plates. Coyote tracks were found throughout the trail. Badger holes were also seen all along the line. Heard a growl about one mile in from the beginning of the trail (going counterclockwise) and think that it may have been either a bobcat or a mountain lion. Two unidentified raptors were seen in Syncline Valley.
- I5 Sooted aluminum plates. Coyote tracks were found along almost every wash. Possible mountain lion tracks were found at station number one (not on the plate). Many deer tracks throughout. Badger holes were found throughout the pasture. A Red Tailed Hawk was seen in the field above station number seven. Many rodent scratches on the plates.
- I6 Sooted aluminum plates. Small rodent tracks only.
- I7 Sooted aluminum plates. Numerous fresh coyote tracks were seen all along the wash. The plates were visited by rodents only.
- I8 Sooted aluminum plates. Many coyote tracks were observed along the road in the canyon. Nothing but rodent and insect tracks on the plates.

Needles District Line Results

Line

- N1 Ground tracking. Coyote and deer tracks throughout. Badger holes in sand all along canyon. Striped skunk tracks found in wash about one mile south of Tower Ruin turnoff.
- N2 Ground tracking. Badger holes all along the trail. Fox and coyote scat also found. Grey fox sighted at intersection of trails to Lost canyon.
- N3 Ground tracking. Coyote tracks throughout. Bobcat tracks in the wet sand all along the wash. Badger tracks also found.

- N4 Sooted aluminum plates. Coyote scat found in the road. Coyote tracks found on last three plates out near the overlook.
- N5 Ground tracking. Mountain lion scat found at two locations. Many badger holes found.
- N6 Ground tracking. Coyote tracks and scat found. Some possible fox tracks. Alot of deer tracks.
- N7 Ground tracking. Coyote tracks on the road. Five deer sighted.
- N8 Ground tracking. Mountain lion tracks and scat found in the Kirks Cabin area. Black bear tracks found at falls just south of Kirks Cabin. Coyote signs were seen everywhere and their howling was heard in the evening.

METHODS

The following techniques, except phototrapline, were researched and found to be most effective for this area.

- a) Scent stations using either of the following to obtain a footprint.
 - 1) Sifted soil
 - 2) Sooted aluminum plates
- b) Ground tracking
- c) Phototrapline
- d) Scat collection
- e) Visitor wildlife observation tracking

All these techniques can be used year round, however in the winter the baits may freeze and be less attractive to animals. Ground tracking ~~could~~ be very effective in the winter, especially after a light snowfall on the ledges and slickrock where bobcats and mountain lions occur much of the time. Ground tracking is very rewarding a few days after a rain or thunderstorm because the ground stays moist in the washes for a couple of days. These conditions are excellent for clear identifiable prints.

I. Scent Station Transects

1. Each line should include at least 10 stations spaced .3 to .5 mile intervals.
2. The lines can be located on trails, roads, washes, or anyplace where carnivores are suspected to frequent. Each line should represent a specific habitat.
3. Describe each line by assigning a number and marking the entire line on a topographic map. Be very specific about the location of the starting point, the direction the line takes from the starting point, and the interval between stops. Photograph the starting point. If possible establish the starting point in reference to a distinct topographic or geologic feature (i.e. trail, intersection, rock point, etc.
4. Describe each stop in as much detail as possible because it is often very difficult to relocate a stop. It is usually not a good idea to mark the stations with flagging or pins etc. as these may frighten animals.
5. Place one station at each stop and use any one or combination of the following baits; tuna cat food, chopped liver from local grocery store, FAS scent discs, or any commercial scent lure. Sometimes it is a good idea to hang part of the bait up in a tree above the station so that the scent will carry further.

A. Sifted Soil Technique

1. Each station should be at least 1 meter in diameter. Use a shovel and a rake to clear the station of vegetation, debris, and rocks, and level the surface.

2. The stations should then be covered with a thin layer of fine, sifted dirt. Common window screening is very effective for sifting the available soil. Prints can be more distinct if a different colored soil is sifted over the station. In this area a source of different color soils can be easily located close to each station.

3. For best results stations should be run for three nights, however, if time does not permit then two or even one night can suffice.

4. Complete a separate data sheet for each line each day. See example of data sheet.

5. Record which stations were inoperable due to wind, rain, trampling by livestock etc.

6. Whenever possible indicate the species of carnivore that visited a station (e.g., "grey fox" vs. simply "fox"). Don't guess on track identification. If the track is not clear, indicate "unidentified" on the data sheet. Measure the length and width of each print plus the stride length and straddle and record these on the data sheet. Photograph each set of tracks, using something familiar for scale. Record any unusual or noncarnivore tracks as well.

7. For more information refer to papers by Linhart and Knowlton (1975), Roughton and Sweeny (1982), and Conner, Labisky, and Progulske (1983).

8. FAS Scent is available from:

Pocatello Supply Depot
238 E. Dillon
Pocatello, Idaho 83201
(208) 236-692

9. Commercial Scents can be obtained at:

Johnny Stewart
PO Box 7594, Dept. T12
Waco, Texas 76714-7594
(817) 772-3261

and

Lenon's Animal Lures
Rt # 1
Box 220
Gilliver, Michigan 49840
(906) 341-6589

10. To re-scent the plaster discs:

- a. Clean used discs with water.
- b. Dry discs in sun for one day.
- c. Add discs to jar of liquid FAS scent, let stand for 24 hours.
- d. Remove discs from jar and let drain thoroughly on tray made of window screen with a drain pan underneath.
- e. Place re-scented discs in an airtight jar and store in a cool dry location.

B. Sooted Aluminum Plate Technique

1. Refer to papers by Taylor and Raphael (1988) and Clark and Campbell (1983).

2. Refer to the scent station techniques for information on bait, and location and description of lines and stations.

3. Each station has two aluminum plates (1.5 x 3 feet) placed next to each other to form an area of 3 x 3 feet. The aluminum plates can be obtained by purchasing common aluminum roof sheathing at a building supply store and cutting it to size.

4. To prepare the plates it is more efficient to soot 20 plates (a complete line) at one time. Take a metal can, such as an empty gallon paint can, and punch a couple of holes along the outside edge at the bottom. Soak an old cotton rag or sock in kerosene and place it in the can. Ignite the rag and, wearing leather gloves, position a plate over the can. The plate will become covered with a film of soot. Be sure to cover the whole plate evenly and completely. Use extreme caution at this stage because the flame will sometimes flare up.

5. When the plates are sooted, carefully stack one on top of the other, roll them up, and strap them tightly together with a strap. The plates will scratch slightly in transport, but these scratches usually are easily identifiable and do not effect the clarity of any tracks.

6. When tracks are found a permanent record of them can be made by rubbing wide (3 inch) clear tape over the track, then removing the tape and pressing it on your note paper. It is very important to rub the track and the area around it completely with your fingernail before you pull the tape up. Practice this before trying it on an important track.

II. Ground Tracking Technique

1. Use data sheets provided and record date, route, weather etc..
2. Record all tracks or sign seen and mark their location on a map. Measure the width and length of two or three representative tracks as well as the stride length and straddle.
3. If there is a need, photograph the tracks using something (scale, film box, coin etc.) in the photo for scale.

III. Phototrapline technique

This was not used in the present study, however there is information available in our phototrapline file and in the paper by Joslin.

IV. Scat Collection

1. Whenever going out in the field bring along some sandwich size zip-loc baggies to collect scat for later identification and analysis.
2. Have pieces of index cards to write notes on and to include in the bag with the specimen. Record the location, habitat, date, weather, and any other pertinent information on the card.
3. Refer to Halfpenny's and/or Muir's books for identification and analysis information. Halfpenny can be reached by phone for further information (303) 492-6241.

V. Visitor Wildlife Observation Mapping

Visitor wildlife observation information since 1978 was analysed and mapped on clear overlays. These are available at the Resource Management office and can be used over the Carnivore map.

Table of Field Results for the Island in the Sky District

LINE	DATE	TRACKS FOUND	ACTUAL SITING	SIGNS FOUND
I1	8/5/88	Coyote		
I2	8/5/88	Coyote		
I3	8/8/88	Raccoon	Coopers hawk Fox	
I4	8/17/88	Coyote	Unidentified Rapter	Badger holes Bobcat growl
I5	8/18/88	Coyote Mountain lion	Red tail hawk	Badger holes
I6	8/18/88			
I7	8/19/88	Coyote		Coyote scat
I8	8/19/88	Coyote		

Table of Field Results for the Needles District

LINE :	DATE :	TRACKS FOUND :	ACTUAL SITINGS :	SIGNS FOUND :
N1 :	8/25/88 :	Coyote :		Badger holes :
:	:	Skunk :		:
:	:	:		:
N2 :	8/25/88 :	Badger :	Grey fox :	Badger holes :
:	:	:		Fox scat :
:	:	:		Coyote scat :
:	:	:		:
N3 :	8/26/88 :	Coyote :		:
:	:	Bobcat :		:
:	:	Badger :		:
:	:	:		:
N4 :	8/27/88 :	Coyote :		Coyote scat :
:	:	:		:
:	:	:		:
N5 :	8/28/88 :	:		Mt. Lion scat :
:	:	:		Badger holes :
:	:	:		:
N6 :	8/29/88 :	Coyote :		Coyote scat :
:	:	:		:
:	:	:		:
N7 :	8/30/88 :	Coyote :		:
:	:	:		:
:	:	:		:
N8 :	9/29/88 :	Mt. Lion :		Mt. Lion scat :
:	:	Black Bear :		Coyote howling :
:	:	Coyote :		Coyote scat :

DISCUSSION

Of the techniques used in this study the sooted aluminum plates and ground tracking were the most effective. The sooted aluminum plates require alot more preparation and handling than the sifted soil scent station technique, but the ability to get a clear permanent record of the tracks in your notebook far outweighs any of its disadvantages. All too often we would set up the sifted soil scent stations only to find unclear unidentifiable tracks on them. Another major advantage of the sooted aluminum plates is that they can be set up on any substrate including bare rock. This allows much greater flexibility in the placement of lines and stations.

Ground tracking was very effective also, especially for the first few days after a rain. This is a great time to run lines in canyon bottoms and along washes. Ground tracking after a light snow in early spring, late fall, or winter would probably be very rewarding on the rock ledges and slickrock. This would provide an opportunity to see tracks of animals that rarely come down in the washes and canyon bottoms, and to observe their routes and habits.

Useful results in a study like this can only be obtained over an extended period of time. The time spent on this study has only been about a month and this is inadequate for accomplishing the objectives set forth. Mainly what we have done is determine the most effective techniques in the Canyonlands area. With this information we can plan a good long term project that can be done consistently. Long term monitoring with these techniques will provide valuable information that will aid in the analysis of carnivore population trends and dynamics.

RECOMMENDATIONS

These comments are an addition to the recommendations of Kurt Johnson in his carnivore report on Arches.

A combination of visitor observations and the techniques discussed here must be used to get a handle on carnivore populations in Canyonlands. Carnivores are elusive, and the high desert environment requires populations to disperse across large tracts of land. For these reasons it is particularly difficult to monitor population densities and trends in this area. The larger carnivores may range many square miles and, due to their opportunistic feeding habits they will cover many different habitats. It may not be possible to match particular species with specific plant communities or habitats. However it is a good idea to limit single transect lines to particular habitats because some habitats may be used more than others at different times of the year.

Lines should be run as much as possible but at least twice a year to get some indication of what is going on out there. These should be done in the spring and fall because these are times of high feeding and breeding activity in this area. Winter ground tracking after a snowfall could be very informative.

For reasons stated in the discussion it is suggested that ground tracking and sooted aluminum plates be the primary field techniques used. Photo tracking has some interesting possibilities but it can be expensive and has not been tried in Canyonlands. Scat collection, analysis, and identification can be very informative and is highly recommended, but it is a difficult technique to master. Spotlighting at night was tried many times without any success. The reasons are probably because the population densities are so low, and if there is an animal out there they can usually hear and/or see you coming way before you get into spotlighting range.

LITERATURE CITED

These papers and/or books are in addition to the papers cited in Kurt Johnson's paper on Carnivores in Arches National Park.

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