

MOUNTAIN GOAT ACTION PLAN

Revised June 2011

I. Background:

Biology:

Mountain goats are ungulates that typically inhabit high elevation alpine and subalpine habitats. They are most prevalent in areas that contain rugged and steep terrain and cool areas often with persistent snow (17, 20). In most areas of their range mountain goats are reclusive (5), and do not allow humans to approach closely. When threatened or alarmed, mountain goats will seek steep rocky areas, often referred to as escape terrain (7, 15). They are renowned for their exceptional speed and agility on steep terrain, reaching short term speeds of 10-15 mph.

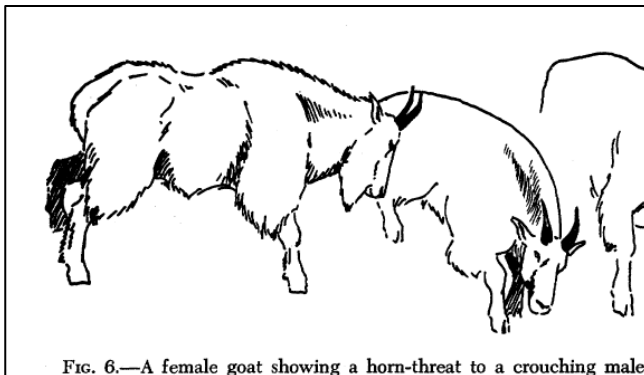
In most areas where they occur, they are reclusive and keep large distances between themselves and humans. In a hunted population in the Washington Cascades, the mean closest distance an observer could approach goats on foot was 351 m (> 1000 ft.) for females with kids and 213 m (> 600ft) for males (21). However in some areas where unhunted populations come in repeated contact with humans, goats have become habituated to the presence of humans (2, 12) and allow people to approach much closer, including within 10 feet.

Although they can occur in large groups, in most portions of their range mountain goats occur in small groups of adult females (nannies) and their dependent young (kids) and occasionally a few associated immature males and females. Adult males (billies) are usually solitary or found in small groups (2, 5, 21) except during the breeding season (rut) when they seek out and tend breeding females. Within groups, goats have an established hierarchy and fair amount of intra-specific aggression. Both males and females have sharp horns which can cause severe injury (2, 6). Consequently, goats have evolved behaviors in which dominance and aggression are communicated through display and aggressive contact is avoided, minimizing the chance for injury.

Alarm, threat and aggressive behaviors include (Figures and nomenclature primarily from Geist [6] and deBock [4]).

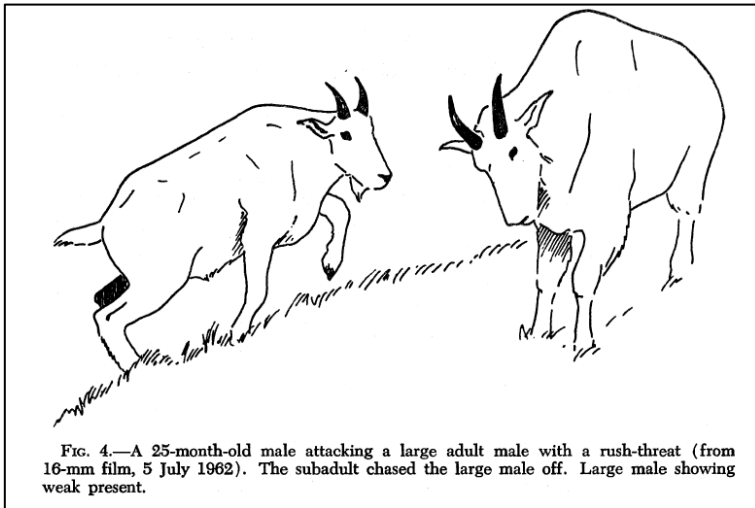
1) Stare threat
Intense stare at opponent.

2) Horn threat



Goat lowers head and pulls in chin, prominently showing horns to opponent.

FIG. 6.—A female goat showing a horn-threat to a crouching male.



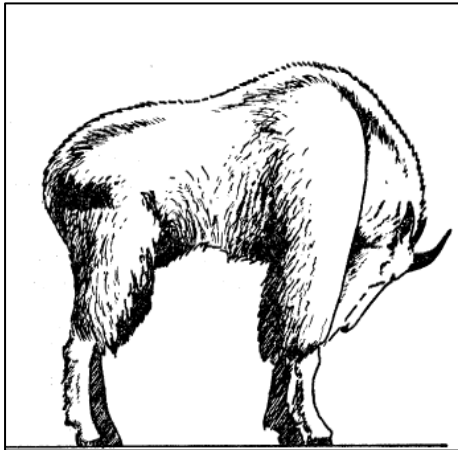
3) Rush threat

This threat is poorly developed in mountain goats as compared to other ungulates. The goat will walk or trot, but rarely run, at an opponent. At the end of the rush threat females and sub adults usually do a horn threat or horn swipe and males do an upward swipe with their horns.

4) Horn swipe

Goat lowers head and sweeps its horns upwards in a half circle motion.

5) Present threat (can follow up with Horn swipe)

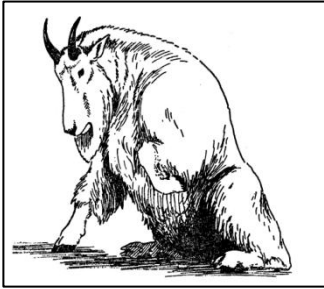


This is a dominance display, done by both male and female goats. It is a fronto-lateral body display, in which the goat raises high on its legs while arching its back and pulling its head down and away, as if ready to strike upwards with its horns. At the same time the displaying goat moves ponderously, slowly, with a nod of the head. The opponent is thus presented with the body mass and height of the displayer. The message is simple: I am bigger than you! If the onlooker is less than impressed he or she will display back. Consequently, the two rivals move in ever-tightening circles about one another, till one loses the nerve and jumps aside, or one of the rivals utters suddenly a harsh roar. At this point the opponent jumps away, or one of the opponents strikes the other with its sharp, dagger-like horns precipitating a fight (Giest, pers. comm. 2010).

In most situations females are dominant to males (2, 14); dominance status has been observed to increase with age (3). Dominance status has also been observed to persist even after horns are lost (17).

Rut in mountain goats typically occurs from November through December (6, 18). Ages of sexual maturity usually range from 2-4 for females, although it can occur earlier in areas where goats are on an exceptionally high plane of nutrition (8, 13). Typically only the most mature and dominant males breed.

Behaviors of billies in rut:



1) Pitting

During the rut billies will sit on the ground similar to a sitting dog. With an arched neck and head looking towards the ground, the male will paw quickly and vigorously with a front leg, throwing snow and dirt at his belly, hind legs and flanks creating a rutting pit (6). This often results in males having “dirty trousers” appearance of dark patches on flanks, rump, and bellies.



2) Brush rubbing

Males will stand and rub the supraoccipital glands (located at the base of their horns) on twigs or bunches of grass by brushing their horns and frontal area of the skull from side to side.

Salt and Mineral Licks: In most areas where they have been studied, mountain goats make regular use of natural or man-made salt licks. Although they can be used throughout the spring through fall months, in most studies peak salt or mineral lick use is June – July (4,10,12,17). In salt lick situations normal patterns of dominance in goat groups are usually NOT observed; males are dominant over females, with adult males being the most dominant and aggressive (19, 17). Males also can be more resistant than nannies to moving out of the area (12). There are no known natural salt licks in the Olympic range.

Hazardous Encounters: Reports of hazardous interactions between goats and humans are extremely rare. In all reported instances, the encounters were between large, mature males in areas where there was a history of both habituation and salt conditioning.

- 1) Glacier National Park (198??), Gunsight Pass. *Details of this encounter are reported in Doug Chadwick’s book ‘The Beast the Color of Winter’ – reference #2.*

The incident took place in midsummer, in an area where hikers lingered, lunched and urinated. Consequently the goats were habituated to people and made a positive association between people and salt. Doug observed that the goats at Gunsight Pass behaved in the same way they behaved at natural salt lick sites – with males being dominant to nannies. Doug used the presence of habituated animals to allow him to get close-up observations of goat behaviors. At first they treated him as a dominant animal and gave him wide berth. However, eventually Doug realized that the largest male in the group was behaving in a manner similar to a goat in rut, and was exhibiting dominance displays towards Doug. This

culminated one day with the large male came in very close to Doug, and performing a stare threat. As Doug looked away, the male drove his horn into Doug's knee and jerked his head upright, knocking Doug to the ground.

- 2) Mt Ellinor (1999), Olympic National Forest, Washington. *There is no formal report on this incident. The details of this incident, including date and time, are unknown; all information comes from accounts that were printed in local papers following the Boardman death in 2010.*

The reporting party states that he was gored in the thigh by a large mountain goat minutes after he left a group of friends on the top of Mt. Ellinor. "We were eating lunch on the top...While we were eating lunch, a big male goat came up to us. I've never seen a real aggressive goat like this...He was licking us and our packs and getting in our food and everything. Eventually, he just left...Usually, you move and they kind of move back. This one was in your face." The injured party had to leave the summit before his friends. As he was changing into ski pants for the descent, the mountain goat jumped from a rock about 15 feet away. "He drilled me right in the upper thigh...It was the last thing that I expected. Fortunately, it turned its head." It knocked him back and opened a 4-inch deep wound in his upper right leg. Instinctively, he swung at the buck (Sic.) with an ice ax. He missed but scared away the animal by yelling at it. Hearing the shouts, his three friends came to his aid and helped him cover the wound with bandages and duct tape. He said the mountain goat waited until he was alone. "It was odd because it was similar to what happened to the guy in Port Angeles...That's exactly what happened to me. His mission was to hit me. He wasn't going to be stopped...The doctor said I was very lucky...It missed the femoral artery by about an inch."

- 3) Hurricane Ridge (October 2010), Olympic National Park, Washington.

This incident took place in an area with high visitor use (primarily day hikers) and year-round goat occupancy. There was a history of habituated goats in the area for over 5 years, with reports of a large male goat (or goats) not yielding way to, following, and occasionally being aggressive to hikers for over 3 years. The victim, Bob Boardman, and two others were hiking on Klahhane Ridge when they encountered a large male while they were eating lunch. The goat approached them and then followed them on the trail for about $\frac{3}{4}$ of a mile. Boardman sent the other two people ahead of him on the trail as they attempted to leave the goat behind. One member of the group said she saw Boardman and the goat walking side by side several hundred yards behind her. The actual attack was un-witnessed but the evidence shows the goat gored Boardman in the lower thigh/knee area and severed a major artery causing fatal blood loss. Emergency care for Boardman was hampered because the goat would not move away from him after the attack until several bystanders were able to scare it away in a concerted effort. Rangers shot the goat later the same day and a necropsy was done on the animal. The necropsy showed no disease or other significant health issues, and confirmed the goat was in rut.

Situation in OLYM:

Eleven or 12 mountain goats were introduced to the Olympics near Lake Crescent from 1925 to 1929, prior to the formation of the park (1, 13). By 1983 it was estimated that the population had grown to 1175 + 171 (SE) animals, with mountain goats occurring throughout suitable habitat on the Olympic Peninsula (13). Over 200 goats occurred in the highest density population – Klahhane Ridge. In the 1980's OLYM implemented a series of live capture operations and removed over 325 animals from the population, and the numbers in the park declined significantly. The latest population estimate, from

2004, is that there are approximately 300 goats in the park (9).

Because many of the areas that goats inhabit are also popular destinations for park visitors, both in the front country (e.g. Hurricane Ridge) and back country (eg. Glacier Meadows), there is a high potential for goat - human interactions in OLYM. Most notable are the many areas where mountain goats are habituated to human presence have also become conditioned to seeking salts from humans. They can be a nuisance along trails and around wilderness campsites where they will persistently seek salt and minerals from human urine, packs and sweat on clothing. They will often paw and dig areas on the ground where hikers have urinated or disposed of cooking wastewater and chew unattended clothing. The nature of goat – human interactions in OLYM can vary widely, ranging from benign (observing goats from several hundred meters away across a ridge) to, from now what we know from the October 2010 fatality, extremely hazardous.

For further information on mountain goat behavior and biology and other material relevant to the formulation of this action plan, see the References section.

II. ACTION PLAN

The goal of this management plan is that goats in the park exhibit natural behaviors consistent with other portions of their range, to not have those natural behaviors altered by human use of their habitats (i.e. become habituated or conditioned), and to minimize the potential for hazardous goat human encounters.

Examples of **acceptable** mountain goat behavior include:

- Goat retreats at the sight of humans, stays at least 300 feet (100m) away from people at all times.
- When a surprise encounter occurs along a trail, the goat quickly retreats and either puts 100m distance between self and humans, or may seek escape terrain.
- If a human comes in-between a nanny and kid, nanny may display some aggressive postures, but does not make contact and quickly retreats with young.

Examples of **unacceptable** mountain goat behavior include:

- Goat does not retreat when comes in sight of people, lets people approach within 150 feet (50 m).
- Goat approaches and follows people on trails or at camp or rest sites.
- Goat aggressively seeks out areas where humans urinate and consumes soil and vegetation where human urine is deposited.
- Goat makes contact with clothing or equipment; chews gear seeking salt.
- Goat displays aggressive postures or behavior to people when encountered on or off trail.
- Goat attacks and makes contact with humans.

As with the other species management plans contained in this Hazard and Nuisance Animal Plan, mountain goat management in OLYM is an integrated effort between all park divisions, and the emphasis is on prevention. For roles of each division, see Section III.

An overview of the continuum of mountain goat-human interactions, and the appropriate park response, is presented on Table 1. For serious incidents (4 and greater on the table), the Wildlife Incident Team will make decisions about the appropriate response.

Table 1. Goat Management Continuum.

Occurrence	Responses to situation	Management Action Alternatives
1) Single and multiple observations of goats at > 100m (300f)	• Record observations on daily logs and pass onto RM when page is full. • All logs turned in at the end of the year.	• Input observation data into database (RM) • Post level 1 signs at trailheads, distribute to back-country permittees (RP, WIC) • no further action needed
2) Reports of goats not moving off trail as hikers approach until people get within 100 feet; letting people get within 100 ft. but not less than 20 ft.; easily shooed away.	• Report on goat incident form and turn into district ranger and WB immediately	• Input observation data into database (RM) • Inform Wildlife Incident team of situation • Post level 2 signs (RP) • NPS staff implement aversive conditioning on all goats exhibiting unacceptable behavior during regular patrols. • Record aversive conditioning incidents on log and pass information on to WB and Chief Ranger.

Occurrence	Responses to situation	Management Action Alternatives
3) Goats occasionally following people on trail, coming into campsites; not easily chased away; no aggressive postures in adult males	Report on goat incident form and turn into district ranger and WB immediately	- Input observation data into database (RM) - Inform Wildlife Incident team of situation - Post level 2 signs (RP) - NPS staff increase patrols in area; mark animals with paint balls; implement aversive conditioning on all goats exhibiting unacceptable behavior during regular patrols (RP) - Record aversive conditioning incidents on log and pass information on to WB and Chief Ranger.
4) Goats persistently following people on trail, repeatedly coming into campsites; obviously seeking salts; not easily chased away; aggressive postures in adult males	Report on goat incident form and turn into district ranger and wildlife bio. immediately	- Input observation data into database (RM) - Inform Wildlife Incident team of situation - Post level 2 signs (RP) - Evaluate need for area closure (WIT), implement closure if needed - NPS Aversive Conditioning team patrol area for at least one week; mark goats encountered; implement aversive conditioning on all goats exhibiting unacceptable behavior during regular patrols. (RP,WB) - Area closed for one week during aversive conditioning. - More intensive patrols when trail opened to assess goat response to aversive conditioning.
5) Goats aggressively seeking salt; exhibits threat posture when encountered on trail; will not leave area without aggressive hazing	- Report on goat incident form - Contact Park Dispatch - Dispatch Contact Wildlife Incident Team	- Close trail for 2 weeks - Mark goats in area; consider use of permanent marks (ear tag or radio collar) (RP,WB) - Implement aversive conditioning with trained personnel for 1 week. - Patrol closed trail for 1 week to assess efficacy of aversive conditioning (not in uniform) - Consider lethal removal if behaviors are observed to continue after the actions taken above. Removal can occur during the patrol period following the week of conditioning or later if behavior is repeated following opening of the trail.
6) Goat attacks human; makes contact or corners people making egress impossible	- Contact Park Dispatch - Dispatch Contact Wildlife Incident Team,	Lethal removal

RM=Resource Management; RP= Resource Protection; WB=Wildlife Biologist; WIC= Wilderness Information Center; WIT= Wildlife Incident Team

Management actions at levels 2 and 3 are extremely important, as aversive conditioning is much more effective and long lasting before an animal has gotten a reward for being in an area. Level 4 is often colloquially called the “point of no return” when our tools for discouraging the behavior are probably less of a negative incentive than the reward they get.

Education and Training:

Staff:

1. All affected employees will receive information on mountain goat interactions. Briefings by work group supervisors and staff training by the Natural Resources Management Division will be provided to answer questions and concerns of employees, advise of new information or research, etc. Such briefings and related training will normally be scheduled at the beginning of the summer season, but may be conducted at other times, as needed.

2. The staff of the park Dispatch Center will have an up-to-date SOP for reporting incidents, and all new communications center employees will be made familiar with the procedures.
3. Those involved with wildlife management (capture, hazing, handling etc.) will be current on all applicable animal-handling training (NPS-77).

Public:

Various safety and interpretive materials will be developed and widely distributed to park visitors. This will include a park handout describing mountain goats and recommendations for safe hiking and camping. It will emphasize need for not habituating wildlife to the close presence of people, the need to stay at least 150 feet or 50 yards away, salt and urine management, and that the potential for negative goat-human encounters can be minimized, but not eliminated, by controlling human behavior (Appendix 3). This handout will be available at all visitor centers, ranger stations, and concession facilities.

MANAGEMENT OPTIONS

In escalating order, the following management options are available in response to goat incidents. A combination of tactics [e.g. hazing combined with area closures] will most often be used.

Aversive Conditioning: When animals are openly frequenting an area where a number of people are present, an attempt may be made to scare or frighten the animal with aversive conditioning or hazing techniques. If a decision is made to haze a goat or a group of goats in an area, they should be marked if possible. If marking is not possible, information on the animal's behavior, degree of habituation and/ or conditioning, and detailed description of size/weight and identifying marks must be collected and photographs or video should be obtained if at all possible.

One consideration however is that although problem goats may be encouraged to leave an area with hazing techniques, they will probably return if whatever attracted them to the area remains. It is best if all possible attractants in the area are removed, but this is difficult to achieve in a situation where goats are seeking salts from human urine that are of necessity consistently and continually distributed throughout areas of high human use. What we seek to achieve is to re-instill a pattern of avoidance of humans by goats, and to have them seek salts when and where no humans are present.

Hazing techniques include noise stimuli (sirens, compressed air horns, cracker shells) and contact stimuli (thrown rocks, use of a slingshot, paintballs, or rubber projectiles or bean bags fired from specialty shotgun ammunition). A separate protocol on the use of specialty shotgun shells has been prepared, and reference should be made to that document for appropriate uses of such devices.

If hazing is used, field personnel will ensure the safety of non-involved bystanders and employees when performing hazing actions. When such hazing techniques are applied, the goat's behavior should be carefully noted and recorded on a wildlife hazing form (Appendix 1).

Animal Marking: If a goat or a group of goats is frequenting an area and are candidates for hazing, or if there has been a series of incidents in an area and there is uncertainty as to which goat is involved, the park should attempt to mark each animal to better evaluate 1) the situation, and 2) effectiveness of hazing (if animal returns), and 3) help identify the animal if it offends in another area.

There are 3 levels of animal marking that are available for use in goats:

- 1) Paint balls – relatively easy to deploy, no animal capture is needed, but marks are not permanent and care must be taken to a) mark different animals in groups in a manner that they are easy to distinguish between each other (e.g. paint ball color or placement combinations) and b) carefully record color and placement combinations used. An additional advantage of paintballs is that they also can serve as an aversive conditioning technique.
- 2) Ear tags – relatively inexpensive, long lasting, and through the use of different color and number combinations each animal is distinguishable. The disadvantage is that animals must be captured to deploy ear tags. For goat capture protocols, see Appendix 2.
- 3) Radio collar – Because a goats' home range can encompass several different areas where it can come in contact with humans, and can also move periodically to habitats not visible from trails (Jenkins et al 2011), radio-transmitting collars marked with distinct color bands can be used to both mark goats and monitor their activities. The advantage to this technique is that the animals are permanently marked and movements and activities in developed areas can be monitored. The disadvantage is that animals must be captured to deploy radio collars and radio-tracking is fairly expensive. For goat capture protocols, see Appendix 2.

Area Closure: Temporary closure of an area to public use and travel may be used to mitigate the hazard presented by a goat frequenting and exhibiting aggressive behaviors at a specific location. Closures invoked under 36 CFR 1.5(a) require written documentation from the Superintendent to the files and public notification. Emergency closure signs will be posted, access to the area controlled, and enforcement patrols routinely performed. Closures will be maintained for approximately 14 days, or until no unacceptable goat behavior is observed in an area that has been thoroughly searched in 3 consecutive patrols covering a period of at least 1 week.

Aversive Conditioning (e.g. hazing): The use of various noise and contact devices to frighten or haze mountain goats to modify their behavior [such as approaching and following hikers] will be employed when goat interactions reach level 2 - 5. With mountain goats a combination of noise and contact stimuli will be most effective (Chadwick, pers. comm.). To be effective, these techniques must be precisely and consistently applied. For guidelines for the use of specialty rounds refer to the protocol for use of specialty firearms in wildlife management.

Animal Destruction: Where warranted goats may be lethally removed from the Park using firearms or other means of humane euthanasia. For a list of situations in which goat destruction should be considered, see Table 1. Except for emergency situations, the recommendation to destroy a goat will be made by the Wildlife Incident Team with

final approval by the superintendent.

In cases where a goat attack occurs, responding personnel should treat incident site as if it was a crime scene: close the area and secure the scene to preserve evidence. A key goal is to authenticate the association between the specific goat and the victim. The Wildlife Incident ICS plan should be implemented (Chapter 1, Appendix 1). The incident commander will be the Chief Ranger.

Highlights are below:

- Contact Dispatch, Superintendent or acting superintendent, WIT, and WIC and advise of closure.
- Contact PIO who will work with the press.
- Gather all available information that will help interpret what actually happened and aid in identifying the offending individual.
- If lethal removal is approved, aim for heart area; the head needs to be saved for analysis.
- Preserve animal for necropsy (bag head and feet with paper bags covered by plastic), that should be done by a crime lab (i.e. Ashland). All people touching the animal must wear proper protection, due to risk of transmission of zoonotic diseases.

III. Roles and Responsibilities

In addition to responsibilities laid out in Section 1 of the Nuisance and Hazard Animal Plan, the following additional duties are associated with implementing the Mountain Goat action plan:

1. All employees:

- **The KEY action to prevent hazardous encounters with mountain goats is to not let them get habituated to human presence.** All staff must keep a safe distance between themselves and goats (optimal 300 feet, **minimum 150 feet or 50 yards**; visualize ½ the length of a football field). If goats approach closer, encourage them to leave the area with loud noises, arm waving, snapping plastic bags, and rock throwing.
- All staff encountering visitors violating the 50 yard rule will communicate park policies and the rationale behind it, and encourage its enforcement to the best of their abilities. Encourage visitors to shout and wave arms and throw rocks to keep goats at a distance.
- In selected areas of high goat use (e.g. Hurricane Ridge) staff and visitors will be advised to **NOT** urinate on trails in backcountry. Urine deposits on the trail entice goats to use trail areas, and turn trails into long linear salt licks.
- In backcountry campsites in goat range, campers will be advised to seek sites 200 feet away from campsites on the trail for urination, or to urinate in the privies.
- Record all mountain goat observations, using back-country, ranger station, or

visitor center logs as appropriate. Turn in observation forms as soon as the page is filled out, or the end of the season –whichever comes first. Appendix 1.

- Record and report mountain goat incidents (observation class 2 to 6) on a mountain goat incident form, and turn in immediately to the district ranger and OLYM wildlife biologist. Examples of logs and forms are in Appendix 1.
 - **If there is a serious incident report immediately to Dispatch and District Ranger immediately (observation class 5 or above). Dispatch will contact the Wildlife Incident Management Team.**
2. **Resource Protection:** Under authority delegated by the Chief Ranger, District Rangers are responsible for implementing this action plan in their area. Specifically, District Rangers will:
- Investigate incidents in a timely manner. Thoroughly interview witnesses. Check for signs in the field to verify report and pass information on to the Wildlife Biologist and Chief Ranger. If the incident is class 5 or more severe, field personnel should be armed with a rifle or shotgun and personnel should travel in pairs.
 - Consult with the Wildlife Biologist for technical support and advice on mountain goat biology, management tools and options, field assistance, and information on goat activity in the area (from the observation database) as well as the collection, necropsy, and disposition of animals that are destroyed.
 - Ensure all signs related to goat education and warnings are properly installed, and modified as a change in the situation in the local area develops, following the signage instructions contained in this plan.
 - Ensure that if a situation develops (Level 3 and greater) proper information is distributed to visitors at ranger station, entrance booths, WIC, local concessions, etc.
 - Administer emergency area closures. Closures will be implemented and coordinated through the Chief Ranger's office. Closures will be made in consultation with the wildlife incident management team, and information passed, by the District Ranger, to the WIC and dispatch ASAP.
 - Identify and train members of Wildlife Incident Response Team. Participate in aversive conditioning bouts as needed.
3. **Natural Resource Management:** Staff of Natural Resource Management (specifically the wildlife biologist in charge of Nuisance and Hazard Animal management and/or the park practitioner) will:
- Keep the database on goat observations current. Look for patterns in goat incident activity, and inform resource protection if a trend appears to be developing.

- Keep current contacts with regional managers and biologists, and keep abreast of advances in goat management.
 - Maintain cache of wildlife capture and marking supplies, and wildlife incident investigation kits that are rapidly accessible and field ready on very short notice.
 - Assist in field investigations and operations; maintain staff proficiency with dart gun and aversive conditioning tools.
 - Support closure actions by assisting in determining the size and duration of the closure.
 - Identify and train members of Wildlife Incident Team. Participate in aversive conditioning bouts as needed.
4. **Interpretation:**
- Assist in the preparation and dissemination of messaging (signs, handouts).
 - Communicate mountain goat management message to visitors.
5. **Public Affairs Office**
- Coordinate press releases.
 - Communicate with media.

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6/29/2011
Date

Approved by: *Karen Sinton*
Superintendent

7/5/11
Date

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Appendix 1. Goat observation and incident recording forms (can be found on I:\All\wildlife\Wildlife_Forms and the OLYM sharepoint site at <http://www.olymshare.nps.gov/sites/nrm/NRM%20Documents/Forms/AllItems.aspx>

1) Back-country observation forms:

[illegible]

2) Back-Country Incident forms

BACKCOUNTRY WILDLIFE INCIDENT/OBSERVATION FORM		YEAR _____ (V3.11)
PLEASE complete the following form in the event of a hazardous, interesting, or unique wildlife sighting/incident OR a visitor report of such a sighting/incident. Our emphasis is on Bears, Goats and Cougar.		
Encounter types to be reported include a bear foraging in or near a camping area, a goat not moving off trail when encountered; bear attempting to gain access to human food or trash; bear or goat acting aggressively; or other events that seem interesting, unique, or potentially dangerous (for either humans OR wildlife). Thanks for your time!		
GENERAL INFORMATION Reporting Ranger: _____ Backcountry Station: _____ SPECIES _____	OBSERVER INFORMATION Name of observer: _____ Telephone number: _____ SUMMARY OF INCIDENT/OBSERVATION	
Date/Time of observation: _____	Specific location of observation: _____	
Number of animal (# young): _____		
Activity of observer when animal(s) seen (hiking, eating, fishing, camping): _____		
Activity of animal(s) when seen (walking, grazing, etc.): _____		
Animal reaction to observer? How about other people in the vicinity? If so, what was reaction? (approached, stood ground, slowly moved away, etc.): _____		
Observer Response: (e.g. stood ground, slowly retreated, yelled)		over, please →

SUMMARY OF INCIDENT/OBSERVATION, continued

Were actions taken to deter the animal? If so, what type? (loud noise, throwing items, etc.)

Animal Response? (startled/frightened and ran, or nonchalant and remained, etc.):

was human food, trash, salt available? If yes, what and where: (eg. urine on ground, food in backpack)

If so, did the animal obtain anything? What?

How was food stowed?

Length of observation (mins):

Closest distance to animal(s):

ANIMAL DESCRIPTION

Estimated age, sex and/or size (s):

OTHER INFORMATION

Habitat type (old growth, meadow, subalpine):

Markings (natural marks, tags, paint, etc.):

Condition (any visible injuries?):

*If needed, please attach a separate sheet for additional notes that may help describe incident.

*Please tear-out and submit forms at the end of each tour to Patti Happe in NRM. Thanks!

3) Ranger Station Log

BEAR AND GOAT OBSERVATIONS AND VISITOR REPORTS OF OBSERVATIONS (for cougar use cougar observation form please)											vs.11
Please turn in observation sheets monthly, or once completed, to Patti Happe in Natural Resources Management.											
For incidents PLEASE fill out incident forms and turn in immediately (eg. If Animals < 50 yds, would not move away in presence of people, were in campsite, attempted to get food or salt, or you used aversive conditioning)											
DISTRICT / RANGER STATION						YEAR _____					
Bear / Goat / other	Date	Visitor or ranger report?	# of animals	# of young	Exact Location	Animal Activity	Animal response to person	Closest distance to people (feet)	Length of obs. (mins)	Marked? If so how?	Incident Form filled out?

4) Goat Incident Form

MOUNTAIN GOAT INCIDENT FORM V1.11 Prompt and Accurate information on the behavior of habituated and/or aggressive mountain goats is critical to mountain goat management in Olympic National Park. If you see or get reports of nuisance or hazardous goat-human interactions (eg. goats allowing people to approach <50 yds, following people, entering into campsite while people are present, refusing to yield the trail to hikers, exhibiting aggressive postures towards humans) please fill out this form as accurately as possible and turn in immediately to the wildlife biologist. For more information on goat biology, behavior and mountain goat management in OLYM please read the mountain goat action updated in 2011. Recorder: Duty Station: OBSERVER INFORMATION Name: _____ Phone #: _____ Address: _____ Email: _____ SUMMARY OF INCIDENT/OBSERVATION Date: _____ Time of Observation: _____ Location of Observation (as exact as possible): _____ Total # of animals: # kids: # yearlings : # adult males: Activity of person/people when goat(s) seen (eg. hiking, camping, picnicking.): _____ Activity of goats(s) when first seen (eg. walking, grazing, bedded): _____ Response of goat(s) to people: (eg. stood ground, approached, horn threat, pitting) <u>describe</u> _____  Over →	SUMMARY OF INCIDENT/OBSERVATION, CONTINUED Was aversive conditioning used by person? Yes/ No If so, what type? (eg. loud noise, throwing items): _____ How did goats(s) react? (eg. ran away, walked away, stood ground, aggressive pasture?): _____ Was human salts available to the goat? If so, what form? (eg. urine on ground, sweat soaked clothing.) _____ If so, did the goat (s) consume it? _____ Length of observation: _____ Closest distance to goat(s): _____ Markings on goat(s) (Ear Tags, paint marks (color and location): _____ Additional notes that may help describe the incident/observation: _____ Incident Type: 2 (close approach but easily scared away) 3 (close or following, reluctant to leave, no aggression) 4 (persistently following, not easily shooed away, some aggressive postures) 5 (aggressively seeking salts, threat postures, only will leave with aggressive hazing) 6 attack. Thank You for your help! Please submit forms as soon as possible to either: Patti Happe, Olympic National Park Wildlife Biologist, Natural Resources Management Division (e-mail: patti_happe@nps.gov; phone: 360-565-3065). gph 2011
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5) Wildlife Hazing Form

Mountain Goat patrol log- 2011

Date	Observers	Weather	<u>Hrs on trail</u>	# Goats obs.	# hikers obs.
Describe route					
Describe location and behavior of goats observed					
Marked goats seen (?)					
Behavior and location of marked goats:					
Management Actions Taken – What and Where; Describe any marks given					
Goat response:					

Appendix 2.

Mountain Goat Snaring Protocol Olympic National Park

Introduction:

This protocol describes procedures that will be used to manually capture mountain goats in Olympic National Park by foot snaring. The method involves attracting habituated mountain goats to park staff using salt and catching them with a hand-held rope leg snare.

The method was used extensively in Olympic National Park during the 1970's and 1980's during investigations of mountain goat movements, dispersal, habitat selection, and reproductive biology (Stevens, Stevens, Hoffman, Houston et al. 1994), and again in 2005 and 2007 during development of a sightability model needed to refine census methodology. Advantages of the leg snare method are: (1) it is very safe for mountain goats – there is very little risk of capture-related injuries or deaths and (2) equipment and logistical requirements are minimal. Disadvantages of the method are that there is some injury risk to human field crews and it is not possible to obtain a representative sample of all mountain goats in the park using this method; some goats are not habituated or live in too inaccessible of areas to be sampled.

This protocol has been compiled from discussions with 4 experienced members of the capture crews that pioneered and used this capture method in the 70's and 80's (V. Stevens, R. Hoffman, E. Schreiner, R. Olson; Personal Comm.) and crews that used the method in the 2000's (P. Happe, D. Manson, K. Jenkins).

Selecting Sample Sites: This method will work in areas where there are consistent reports of mountain goats that are coming into human sources of salt – frequently human urine, sweat-soaked pack-straps or hiking boots, and salted cooking liquids.

Crew: Optimally a ground capture crew will consist of three members: a nooser, a primary restrainer and a secondary restrainer. Smaller female mountain goats can be handled by a two-person crew. Even with smaller goats a third person is often useful to talk with interested park visitors who may be drawn to the capture operation.

Establishing the snaring site: After a specific group of goats is targeted, the crew will select a site for the noosing operation. The site should have a vegetation-free area for applying the salts (i.e., sites that won't be damaged by goat pawing and eating) surrounded by relatively smooth terrain for setting the snares. Either human urine and/or chips from a salt block will be used as bait. First the nooses are established; then the site is baited. After locating the specific site for the bait, 3-4 snares will be set approximately 3-4 feet from the bait site. Generally we will set one rope snare for each member of the capture crew. Snares consist of a 25 foot segment of 5/16 or 3/8" braided poly cord with a loop tied or spliced on one end. The snare is created by feeding the rope through the loop to form a 12-18"-diameter noose. The noose is placed flat on the ground and the

pull-line is laid out to where the crew member will wait. There should be no kinks, loops in the pull-line. If a suitable anchor tree or log exists, the back end of the pull-line should be anchored by tying off to the tree. One variation of the set is to elevate the noose approximately 1-2" off the ground using a 'campfire ring' of small stones as a platform for the noose. After establishing all the nooses, apply the bait to the center of the site. If salt-block chunks are used, the salt should be offered in a 12"-diameter plastic container to prevent salt leaching into the soil.

Catching the goat: The crew will wait patiently until a goat steps into one of the set snares. The consensus of former goat ropers is to catch a rear foot, although the front foot is favored by one former roper and may also be used. The goat is caught by yanking suddenly on the pull cord. The benefit of using the hind foot is that once the goat is snared and tries to run away from the nooser it often stretches out low to the ground facing away from the nooser, a position in which the animal may be safely tackled. The disadvantage of using the front foot is that there may be a greater risk of leg or shoulder injury as the goat tries to twist away from the nooser.

Animal tackling is a dynamic and quick event—there is no text book formula. In general, the nooser will hold the rope while working his/her way down the rope to the animal and trying to stretch the animal out. The tackler will approach from the back, throw a flannel shirt over the goats head (blinding it) and grasping ahold of the goat's horns and applying steady, heavy pressure to the upper shoulders and neck. While it is necessary to control the head, care should be taken to not pull the horn from its sheath. The tackler will wear impact resistant eye protection secured with a head band. The nooser or the third person will apply weight to the hind quarters from the back side of the animal, while helping to control the feet. The goat will be hobbled with leather buckled hobbles or hog-tied with the snaring rope. Once blindfolded and secured, the goat will generally 'give up' or at least reduce struggling to the point where former crews have been able to weigh, measure, and draw blood. If the goat struggles excessively, a female goat may be sedated using 25-30 mg xylazine (Jessup 1980)—a large male may require more but begin with 30mg. **(If this xylazine is used, all animal handlers must the have necessary training to handle wildlife pharmaceuticals).** All members of the capture crew should wear light, flexible leather gloves until the goat is secured.

Goat Procedures.

- A) Blindfold, hobble, place horn blunters on horns
 - a. sedate if necessary
 - i. **Females** 25-30 mg Xylazine (@300mg/ml = **0.9 ml**)
 - ii. **Males** 30-35mg Xylazine (@300mg/ml = **0.1 ml**)
- B) Apply Gentak to eyes
- C) Ready radio-collar (if used)
 - a. Test VHF
 - b. Record VHF frequency and S/N on field forms
- D) Place radio-collar on animal
- E) Install ear tags

- a. Unique color code for the area to each ear
- b. Record tag color and numbers on data sheet
- c. If use hole punch, collect tissue sample
- F) Measure animal
 - a. Measure body weight if possible (using nylon sling)
 - b. Measure chest girth (cm)
 - c. Measure neck circumference (cm)
 - d. Measure total body length (contour) (cm)
 - e. Measure hind foot length (tip of hoof to tip of calcaneum)
 - f. Measure length of horns from base to tip along outer contour
 - g. Measure distance from tip of horn to 1st ring
 - h. Measure distance from tip of horn to 2nd ring
- G) Assess body condition
- H) Draw blood (two red tops, one purple)
- I) Collect hair
- J) Collect fecal
- K) Administer Yohimbine if animal has been sedated (IV if possible or else IM)
 - wait 4 minutes for IV injection, 10 minutes for IM injection before releasing)
 - 0.3 mg/kg @ 10 mg/ml
 - a. **Yearlings @ 32 kg =1 ml**
 - b. **Sub-adult Males @ 60 kg = 1.8 ml**
 - c. **Sub-adult females @ 50 kg=1.5 ml**
 - d. **Adult males @ 110 kg=3.5 ml**
 - e. **Adult females @ 60 kg= 1.8 ml**
- L) Release Animal.

Emergency Procedures. We anticipate no emergency procedures necessary due to the unobtrusive nature of the capture operation. In the unlikely event of a serious limb injury (dislocation, break), the procedure will be to euthanize the animal either through the use of a captive bolt or firearm with a shot to the center of the head in between the eyes.

Mountain Goat Study CAPTURE FORM

Date ____/____/____
yyyy/ mm/ dd

Animal # _____
(yyyy/sex/###)

Capture

Team:_____

General Location:_____

Specific Location (GPS) LAT_____Long_____

Weather: temp (f)_____ precip:_____ cloud cover_____

Time on_____ Time off_____

Collar#_____ VHF Freq_____ Color_ ☐Magnet OFF

Ear Tag R (#/ Color) ____/____ Ear Tag L (#/Color)_____

DRUGS USED (military time):

	#1	#2	#3	#4
Drug Name				
Mg used				
Vol used				
Route (im, iv, subq)				
Site (hip, neck)				
Time of Injection				
Time down/up				
(time animal found)				
Induct/ReversalTime (minutes)				

Capture Notes:_____

Samples: ☐Blood/Purple, ☐Blood/Red ☐Hair, ☐Fecal, ☐Ext. Parasites, ☐Tissue

Treatments: (list)

Monitoring

<u>Time</u>	<u>Sign</u>	<u>Obs</u>	<u>Time</u>	<u>Sign</u>	<u>Obs</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Measurements: Estimated age_____Horns: ☐ Photo

Weight_____kg

Chest girth_____cm

Neck circumference_____cm

Total length_____cm HindFoot_____cm

Lactating: ☐Yes ☐No

Horn Lengths (cm)	Left	Right
Total Length		
1 st ring		
2 nd ring		

Condition: Withers_____inch pinch.

Equipment List for Field Capture Crew (go loaded for 2 goats)

<u>General</u> Ready supply of urine :) Salt block chunks Salt tray Rope snares (4) Hobbles Flannel shirt (blindfold) Horn guards (5" segments of garden hose) Impact resistant eye protection Leather gloves (each individual) Protocol First Aid Kit Park Radio Radio collars (2) MHz Receiver and Antenna (?) <u>Drug Kit</u> Xylazine Gentak Yohimbine 4 1cc syringes 4 3cc syringes 2 10cc syringes 6 18 gauge needles Thermometer Stethoscope	<u>Collaring Kit</u> Sharpie, fine tip (2) Pencil Captive Bolt Nutdriver Ear tag applier Measuring tape Latex gloves Collections Baggie (1 per animal) -field form -ear tags -20cc syringe -18 gauge needle -Redtop tubes (2) -Lavendar tube (1) -Hair bag -Fecal bag -Tissue vial <u>Optional:</u> -Scale (what about weighting pole, can we use two hiking sticks together? I'll volunteer mine) -Weighing sling (4x4ft nylon)
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Appendix 3. Goat outreach materials and signs. 3 level warning system (similar to what is used for cougar and bears). These can be found on I:\All\wildlife\Nuisance_Hazard_Animal\wildlife signs and the OLYM sharepoint site at

<http://www.olymshare.nps.gov/sites/nrm/NRM%20Documents/Forms/AllItems.aspx>

Level 1: General about goats (yellow). For use in areas where goats are seen but where we have no reports of habituation. Implementation: post at trailheads, distribute with backcountry permits, post on backcountry trip planning website.

Mountain Goats & Your Safety



Mountain goats are a non-native animal introduced to the Olympic Mountains in the 1920s. Like any wild animal, they can be dangerous, but some goat behaviors increase the risk to humans. Following the guidelines below can help you have a safe experience if you encounter a goat:



- Mountain goats can become very tolerant of people and allow very close approach.
- If habituated, goats are more apt to “stand off” than most other large mammals, and will hold their ground rather than move away.
- Male goats become more aggressive during the breeding season, which peaks in November, but can begin in October and run well into December.
- All goats use their potentially lethal sharp horns to defend their personal space.
- Mountain goats crave salts. In some areas they seek human salts in urine or sweat soaked clothing, leading to conflicts. Do not urinate on or near the trail. Please go off trail at least 50 yards and urinate on a rock or bare ground. Don't leave sweaty clothes unattended—goats may chew them.
- **Keep a safe distance—at least 50 yards (half a football field)—from mountain goats at all times.** Animals that are closely approached may lose their natural fear of people, and become habituated to humans. Once habituated, they may develop aggressive behaviors or attempt to assert dominance over people.

If a goat approaches you, slowly move away to keep a safe distance. If it follows you be prepared to chase it off by yelling, waving coats or other objects, or throwing rocks.

If you encounter a mountain goat within 50 yards, please report it to the closest ranger station.

Level 2 (Orange): For use in areas where there are reports of habituated and salt conditioned goats (not for use in situations where we have aggressive mature billy). Implementation: post at trailheads, distribute with backcountry permits, post on backcountry trip planning website.

WARNING



Habituated Mountain Goats in Area



Goats in this area are closely approaching and following people or entering campsites. Habituated wildlife can become aggressive. Goats have sharp, lethal horns.

- Stay at least 50 yards (1/2 length of a football field) away from all wildlife. You may be cited under 36CFR1.5(f) if you are observed closer than 50 yards.
- If a goat approaches, be prepared to chase it off by yelling, waving coats, or throwing rocks!
- Goats crave salts. Urinate on rocks or snow at least 100 feet from the trail. Do not leave sweaty clothes unattended.
- Male goats become more aggressive in the autumn and early winter breeding season.
- **If these goat behaviors persist or deteriorate, this area may be closed and further actions taken.**

Following these guidelines will help protect you and park resources. If you encounter a mountain goat within 50 yards, please report it to the closest ranger station.

Level 3 (Red): Closure for NPS administered intense hazing or lethal removal.

Implementation: post at trailheads, distribute with backcountry permits, post on backcountry trip planning website, press release.

DANGER

**THIS AREA IS CLOSED DUE TO THE
PRESENCE OF AGGRESSIVE MOUNTAIN
GOATS.**

Removal of this sign is illegal under 36 CFR 1.5 and
may result in injury to you and others who follow you
into this area