Removing non-native mountain goats from the Olympic Peninsula

PATTI HAPPE, Olympic National Park, Port Angeles, Washington
KRISTIN MANSFIELD, Washington Department of Fish and Wildlife, Spokane
JENNY POWERS, National Park Service, Fort Collins, CO
WILLIAM MOORE, Washington Department of Fish and Wildlife, Ellensburg
SUSAN PIPER, Olympic National Forest, Olympia, WA
BRYAN MURPHIE, Washington Department of Fish and Wildlife, Port Townsend
RICHARD B. HARRIS, Washington Department of Fish and Wildlife, Olympia

ABSTRACT: In 2018 the National Park Service (NPS), in cooperation with Washington Department of Fish and Wildlife (WDFW) and the U.S. Forest Service (USFS), initiated a project to remove all non-native mountain goats from Olympic National Park and contiguous habitat in Olympic National Forest. The first step of the two-part plan was capture and translocation. From September 2018 through August 2020, we conducted 4 two-week long aerial capture sessions. During those operations we removed 381 of the estimated 725 goats from the Olympic Peninsula (OP), of which 325 were translocated to the Cascade mountain range in Washington State, and 16 kids were distributed to zoos. Operations halted at the end of the 4th session when goats became increasingly hard to catch and capture mortality exceeded 10%. The remaining goats will be removed through lethal means.

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INTRODUCTION

Although native to western North America, mountain goats (*Oreamnos americanus*) in addition to several other alpine species, are not native to the isolated Olympic Mountain range in northwestern Washington State, USA (Figure 1). Mountain goats were introduced in the Olympic Mountains during the 1920s prior to the establishment of Olympic National Park (ONP) in 1938 (Scheffer 1993, Houston *et al.* 1994, Noss *et al.* 2000). Over the succeeding decades, the population increased in size and expanded throughout the Olympic Mountains. By the mid-1970s evidence accumulated of negative effects of overabundant mountain goats on soils and endemic plants in ONP's high-elevation plant communities (National Park Service 1995). Despite the desire to minimize negative effects on sensitive alpine resources, mountain goats remained charismatic and popular with the public. In fact, the question of what to do with this introduced herbivore is among the most hotly contested in the ecological literature regarding invasive species (Jessup 1992, Scheffer 1993, Houston *et al.* 1994, Hutchins 1995, Wagenvoord 1995, Noss *et al.* 2000). This controversy resulted in an unfinished mountain goat management planning process in the mid-1990s (NPS 1995) and Congressional action to stop a lethal removal project in 1997 (Associated Press 1997). In 1983, ONP conducted the first aerial survey to estimate mountain goat population size throughout the Olympic Mountains (Houston *et al.*1986), returning an estimate of 1,175 (SE = 71). During the early 1980s, the NPS, working with WDFW, captured and transplanted mountain goats from ONP to other ranges throughout several western states to reduce the population (Houston *et al.* 1991). From 1981 through 1989, 407 mountain goats were captured and removed from the park (Houston *et al.* 1994). An additional 119 mountain

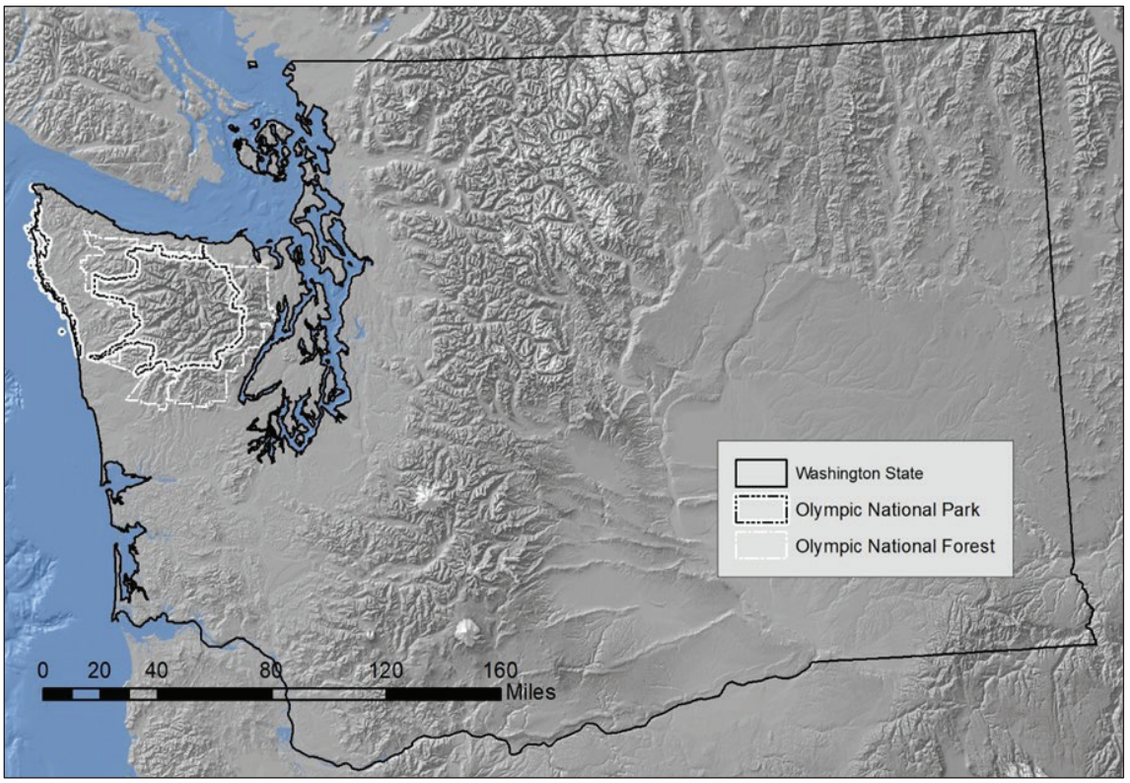

Figure 1. Olympic National Park and the surrounding Olympic National Forest, Washington.

goats were killed legally during sport hunting seasons outside the park, and three known illegal kills occurred within ONP during 1983–1997. The aerial capture and removal program was halted in 1990 due to human safety concerns associated with aerial capture operations (Houston *et al.* 1994). No mountain goats were transplanted from the Olympic Mountains during 1990-2018.

A second mountain goat survey, conducted in July 1990 following the cessation of initial capture and transplant operations, produced an estimate of 389 (SE = 106; Houston *et al.* 1991). Subsequent surveys conducted in 1994, 1997, and 2004 produced estimates near 300, but a significant increase in the population was detected by the survey work conducted in 2011 (Jenkins *et al.* 2012). Along with the increase in the goat population came increasing levels of habituation of goats to human visitors and conditioning to human-derived salts. Some goats became aggressive in their salt-seeking behavior, resulting in a human fatality in 2010. The most recent rigorous estimate, conducted in 2016, indicated that the population, estimated at 623 (SE = 43), increased approximately 8% annually since 2004 (Jenkins *et al.* 2016), raising concerns anew about additional increases (and associated resource damage and visitor safety) before a new reduction effort could begin. If this rate of increase continued, NPS estimated ~725 animals in the population by 2018.

On June 18, 2018, after years of planning and extensive public review, a Record of Decision was signed, authorizing a plan to remove mountain goats from ONP. The declared purpose of the plan was to "…reduce or eliminate impacts on park resources from exotic mountain goats while reducing public safety issues associated with the presence of mountain goats in the park" (NPS 2018: 1). Its objectives included to "…work cooperatively with co-managers of mountain goats or habitats in Washington State" and to "…provide opportunities to reestablish or augment sustainable native

mountain goat populations in suitable mountain goat habitat…" The WDFW and USFS were cooperating agencies in the planning process, and consequently the plan covered Olympic National Forest lands adjacent to the park, as well as state and USFS lands in the Washington Cascade mountain range. The approved plan included two phases: a 5-year initial management phase and a subsequent 15-year maintenance phase. The goal of the initial management phase was to remove at least 90% of the goat population from the Olympic Peninsula (on both NPS and USFS lands), first through capture and translocation and later by lethal removal when capture operations were deemed no longer safe or feasible. WDFW had responsibility for translocating mountain goats (National Park Service 2018, Harris *et al.* 2020).

Herein, we describe capture efforts and accomplishments during the first 3 years of the initial management phase. We cover efforts that took place during 4 capture sessions (September 2018, July 2019, August 2019, and July/August 2020). Details on capture logistics and planning, including rationales for choice of dates for operations and locations of operation bases, are provided in National Park Service (2018), Happe and Harris (2018), and Harris *et al.* (2019). The lethal removal phase is ongoing and data will be provided in subsequent documents. Planning and implementation of the reintroduction and augmentation component in the North Cascades are provided in Harris *et al.* (2020).

METHODS

Field capture

Capture teams consisted of 3-5 crewmembers and the pilot. All crewmembers were experienced and qualified in the use of remote chemical immobilization. The capture team caught goats by net gun, chemical immobilizing dart, or a combination of both. Details of chemical immobilization are provided in Appendix 1. After securing a goat, the capture team immediately reversed the capture drug (if one was used) and all adult goats were to receive the sedative midazolam in the field to reduce stress during the transport flight. Captured goats were hobbled, blindfolded, and secured in specialty sling bags until they were ready for transport (Figure 2). Field capture datasheets and horn guards were attached to each goat prior to transport.

Captured goats were transported via sling load to the closest helicopter base, where they were secured, placed in a sternal position, and given a quick evaluation. Goat sling load size ranged from 1 to 5, with an average of 2 goats per load (loads with larger numbers of goats included kids accompanying their mother). Very active goats were given an additional dose of midazolam at the helicopter base, and those that were hot (see below) were immediately cooled with water. In 2020 a few goats appeared overly sedated upon delivery, to the point where it was difficult for them to keep their head up and maintain their airway during the transport flight (this issue was not observed in 2018 or 2019). Midway through the 2020 capture operation, after consulting with the veterinarians and the capture team, we ceased administering midazolam in the field, and instead gave it by hand injection to all adult and yearling goats after they were delivered to the helicopter base.

Mountain goat processing

After delivery to the helicopter base, each goat was transported to the processing area to be weighed and then taken to one of 3 processing teams (Figure 3). Processing teams were led by a veterinarian or an experienced vet tech and consisted of 2-3 staff experienced with working with immobilized ungulates, 1-2 trainees, and a designated data recorder. Information from the capture team or the helicopter base staff regarding potential injuries or other concerns about animal condition were conveyed to the processing team. Staff veterinarians evaluated each goat for emergency medical conditions and treated, if necessary. Animals were placed in a sternal position (often supported by sandbags), and vital signs (temperature, respiration, heart rate) monitored and recorded. Cotton ear plugs were inserted, eyes were checked and flushed with sterile eye wash if necessary, and sterile ophthalmic

Figure 2. Captured goats attached to sling load in the field (a), delivered to the transport truck (b,c), evaluated prior to transport to the processing area (d), transported to the processing area (e). Photo credits: Leading Edge Aviation (a), Darryn Epp (b), John Gussman (c,d,e).

ointment applied. Horn guards, hobbles, blindfold, and earplugs remained in place throughout the processing.

In addition to sex and age, body mass, horn dimensions, body measurements, and lactation status were recorded. Samples taken included nasal swabs, tissue for DNA extraction, blood, hair, and fecal samples. After evaluation by a veterinarian, each goat was assigned a body condition score of 1 to 5, where 1 was very poor and 5 was very good, and largely reflected the fat layer depth over the vertebrae and ribs (Iowa State University 2011). All goats were given BoSe® (3 ml/45kg) and Vitamin E-300® (5 ml/45kg) to mitigate oxidative cellular stress, fluxinin meglumine (1.1 mg/kg, a nonsteroidal anti-inflammatory and analgesic), ivermectin (0.2 mg/kg, an anti-parasitic), and oxytetracycline (10mg/kg, an antibiotic). In 2019 we added the anthelmintic albendazol (10mg/kg). In addition, all adult goats and yearlings were given 0.3mg/kg of long-acting tranquilizer haloperidol (Hofmeyr 1981, Wolfe and Miller 2014) in recognition of the upcoming ~ 24 hours in transport. In addition, most received 1 L buffered isotonic fluids subcutaneously to prevent dehydration. Each animal was given an ear tag with the unique number corresponding to the animal number in the records. Photographs were taken of the horns and teeth of each animal in 2018. All adults were equipped with a radio-collar; all but 3 were GPS collars. Kids that were released also received breakaway VHF collars in 2018, and breakaway GPS collars thereafter.

Mountain goats are sensitive to intra-group hierarchical relationships, and typically maintain

Figure 3. Mountain goats in the processing area. Upper left: weighing. Upper right: overview of processing area. Lower left: A processing team. Lower right: Loading into crate.

social relations via aggressive interactions (Geist 1967). In a stressful, unnatural situation (such as capture and retention in captivity), we considered the goats would likely engage in considerable aggression if housed in groups. Mountain goats also are sensitive to stress, warm temperatures, and capture myopathy (Hebert *et al.* 1980, Blood 2001). Blood (2001) reported that transplant-caused mortality rates for mountain goats in British Columbia during 1980-2000 were higher (10.6%) than for other translocated ungulates. Thus, we elected to transport mountain goats from the OP to release sites using individual crates (ODFW and CTWSR 2010) built (n = 50) specifically for the program. Crate design was modified from those developed by the Oregon Department of Fish and Wildlife (ODFW); crates constructed of heavy-duty plywood with metal frames and vertically sliding

doors were approximately 144 cm long, 47 cm wide, and 108 cm high, and were equipped to facilitate moving by hand and slinging by helicopter. Three horizontal rows of holes (1 to 4 cm diameter) drilled into the sides of each crate ensured adequate ventilation during transport. After processing, each goat was moved directly into a transport crate (Figure 3). The crates were kept in a secluded and shaded area, away from noise and disturbance, until they were ready to be loaded into the transport trucks. If individual goat rectal temperature remained elevated (>38.5ºC (101.5ºF)) or ambient temperatures rose to a point where over-heating in the crate was a concern (as indicated by panting goats), block ice was placed in the crate and the crate area was cooled by fans and/or a water misting system, or crated goats were placed in refrigerator trucks where the ambient temperature was adjusted to approximately 10º C (50º F).

Mountain goat kids for captive facilities

Because we anticipated low survival of translocated kids (Olson *et al.* 2010), and it was difficult to pair all kids with their mother, we made efforts to place as many kids as possible with accredited captive facilities. As per a Memorandum of Understanding between WDFW and Northwest Trek Wildlife Park (NWT, associated with Port Defiance Zoo and Aquarium, Tacoma, Washington, accredited by the Association of Zoos and Aquariums, AZA), kids captured without their mothers were donated to NWT to care for until qualified zoological parks with interest could adopt them.

RESULTS

Over the 4 removal sessions, the helicopter flew 270 hours during 41 days (Table 1). We removed 381 goats from various sections of the OP (Figure 4), of which 325 were transported to the Cascade Range on the mainland for release (Harris *et al.* 2020). The difference between removed and released totals are discussed below.

Although the 2018 capture session was constrained by challenging weather (4 of 14 days were unsafe for helicopter flights, and capture work was cut short due to imminent inclement weather during 7 of the remaining days) and we were restricted to areas near 1 helicopter base, we were able to remove 115 goats. This is largely due to proximity of Klahhane ridge, which was adjacent to the helicopter base (cluster of 2018 captures just north of the Hurricane helicopter base, Figure 4). This area contained ~50 goats and 31 were removed.

Two large males (>110 kg) died during transport on the first day of our capture operation in 2018, most likely due to the small size of the transport crate relative to their body mass. We consequently stopped catching adult males until 2 larger crates, previously used for bighorn sheep (*Ovis canadensis*) rams, could be brought to the site. We then restricted male captures to accommodate what we could transport with the

Table 1. Helicopter use and goats captured on Olympic Peninsula, Washington, 2018-2020

Year	Capture month	Days/ session	Flight hours/day			Number goats caught/ day			Number of goats	
			Min	Max	Total hours	Min	Max	$\bar{x}$	Removed	Released
2018	Sept	10	1.6	8	61.1	4	16	11.5	115	98
2019	July	10	2.5	8	61.7	3	15	8.9	89	76
2019	Aug	11	5.9	8	80.3	2	16	11.1	122	101
2020	Jul/Aug	10	3.2	8	66.8	3	15	5.5	55	50
Total		**41**			**269.9**				**381**	**325**

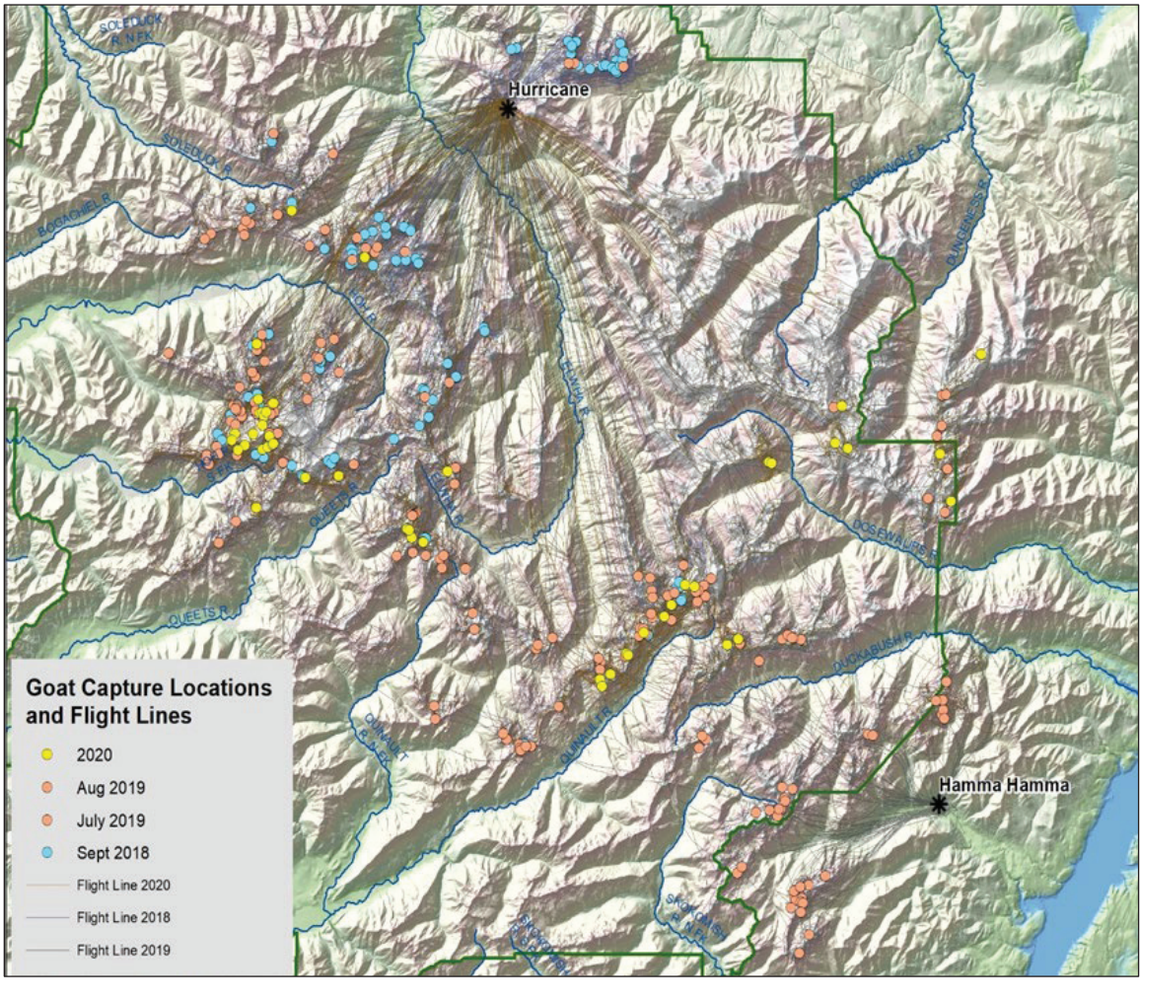

Figure 4. Staging areas, goat capture sites, and helicopter flight lines, 2018-2020. Green line shows the boundary of Olympic National Park.

crates on hand. In addition, in order to improve ventilation, we drilled two additional rows of holes in the crates (they originally had just one). After that change, we lost no more males during transport. After the 2018 capture season, volunteers constructed 10 additional crates with dimensions approximately 164 cm long, 67 cm wide, and 108 cm high that we used for males >110 kg.

During 2019 we removed 211 goats (Table 1). We encountered weather issues in July but made up for the lost capture days in August. Although only 4 additional goats were removed from Klahhane Ridge, capture efficiency remained high due to using a second helicopter base in the southeastern Olympic Mountains at Hamma Hamma (Figure 4). During the 2020 capture session (operated only from Hurricane due to COVID-19 limitations) we removed only 55 goats. Although the weather was more cooperative, goats proved harder to find and harder to capture.

The percentage of goats caught by nets increased over the operation from 59% in 2018 to 75% in 2020 (Figure 5). Mean time-to-restraint (from deploying the net or dart until the animal was tractable) was shorter with nets than darts. In addition, time-to-restraint for darted goats decreased during the operation; the most notable change occurred in 2019 when we switched immobilizing agents from carfentanil to thiafentanil (Figure 5). Mean time between darting and delivery to the helicopter base averaged 36 minutes and was similar across all years. Minimum times ranged

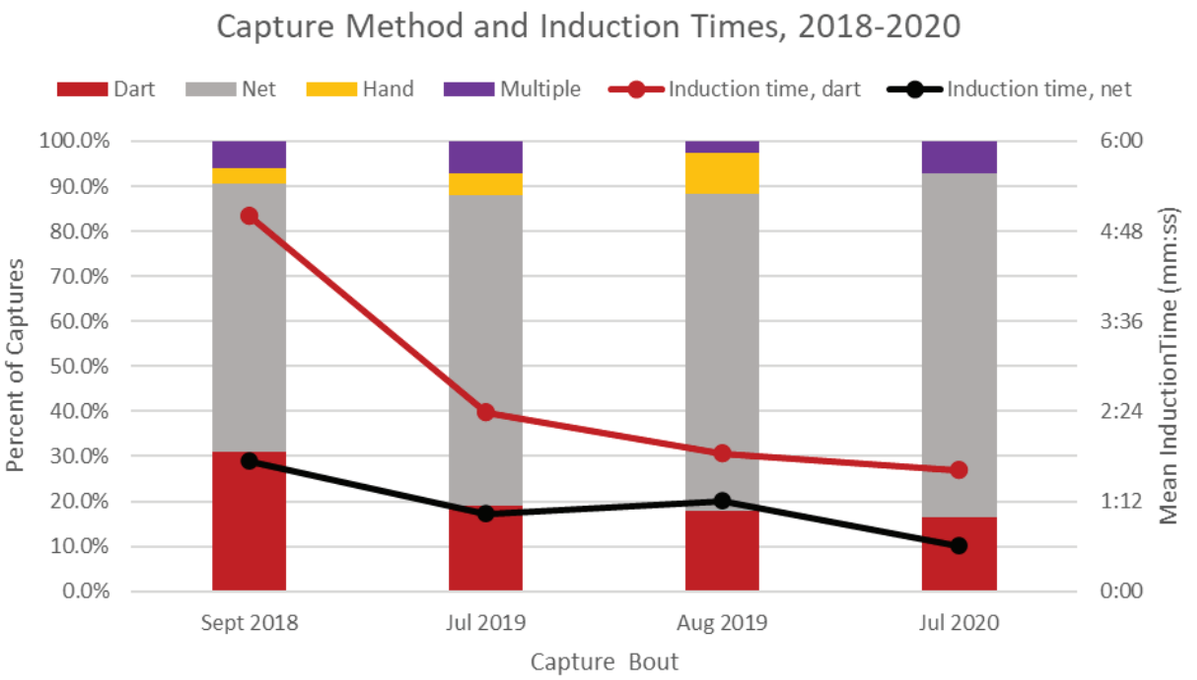

Figure 5. Capture method and time to restraint for mountain goats in the Olympic Mountains, 2018-2020. Times are for when only one capture method was used. Multiple = more than one method employed on a goat, such as a dart followed by a net, or 2 darts.

from 3 minutes in 2018 to 17 minutes in 2020, and maximum times ranged from 1:09 in 2019 to 1:39 in 2018. As anticipated (National Park Service 2018), goats became scarcer and more elusive, and capture efficiency (goats captured per flight hour) decreased as capture operations progressed (Table 2).

Capture mortality rates also increased as the operation continued, primarily due to remaining goats residing in steeper terrain, and injuries associated with falls. The exception to the trend occurred in August 2019, when capture efficiency rates and mortality rates improved slightly from that experienced the previous month due to availability of goats in relatively accessible Mt. Elinor area. August 2019 was the only time that the area was available for capture; it had a moderately high density of goats and was close to the southern staging area (Figure 6).

Adult females comprised the largest sex/age group among goats removed, followed by adult males (Table 3). The higher number of adult females was a result of our avoidance of males during the 2018 capture. One animal was

Table 2. Capture efficiency and goat mortality, Olympic Peninsula, Washington, 2018-2020.

Year	Capture month	Goats removed/hour	Goats translocated/hour	Capture Mortality
2018	Sept	1.88	1.78	5.2%
2019	July	1.44	1.30	7.3%
2019	Aug	1.52	1.38	5.9%
2020	Jul/Aug	0.82	0.76	9.1%

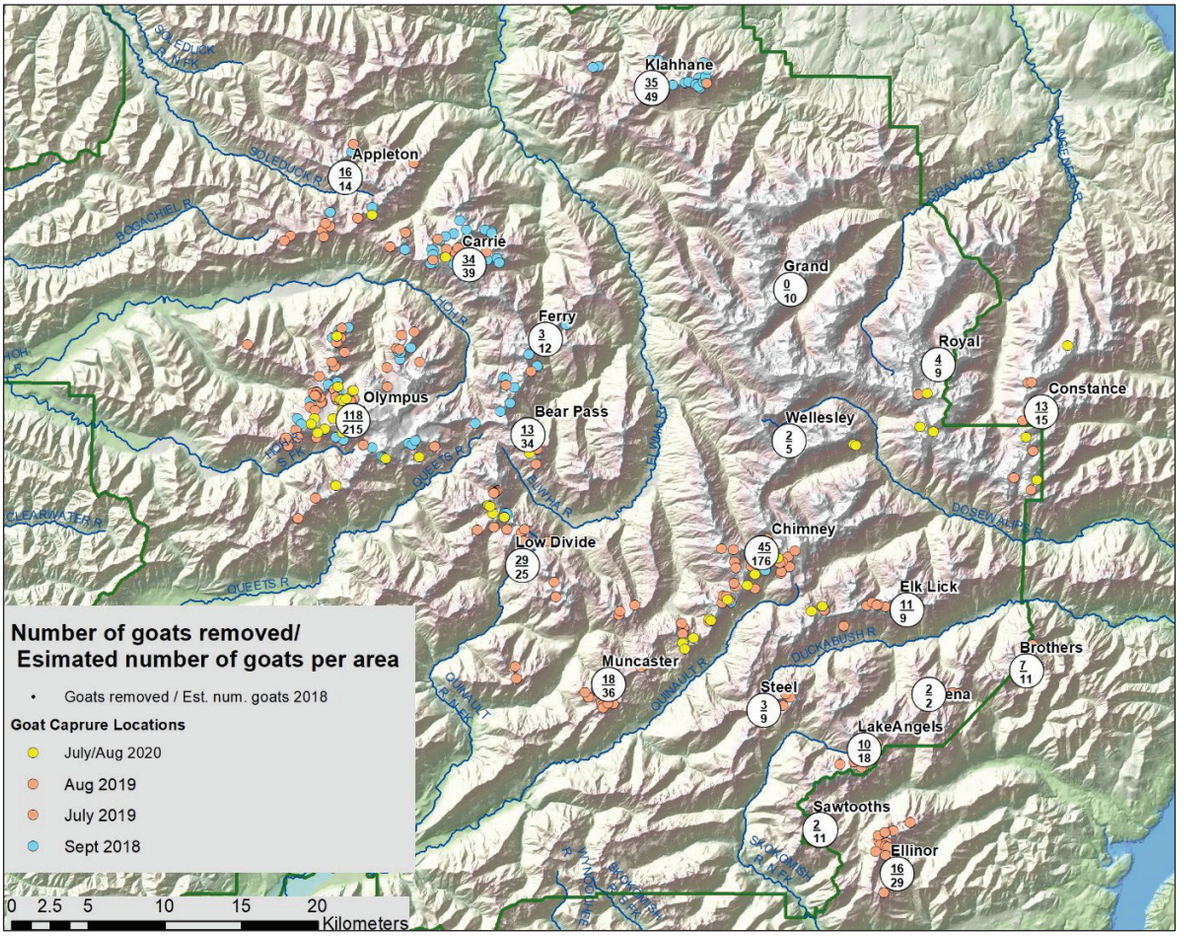

Figure 6. Total number of goats removed (upper number) and the estimated number of goats present (lower number) at the onset of capture operations in 2018. Also shown are capture locations, by year.

considered "intersex" (pseudohermaphrodite), possessing phenotypic characteristics of both genders (see Harris *et al.* 2019 for details). Numbers of goats removed roughly aligned with estimated abundances in 2016 (Jenkins *et al.* 2016), with the largest number coming from the Mt. Olympus area (Figure 6). Twenty-two animals intended for translocation died due to capture injuries (Table 4). Six goats were euthanized: Three with suspected disease, two in condition too poor for transport, and one with a history of aggressive behavior and classified as unsuitable for translocation. Eight additional goats were removed lethally by capture crews because live capture was deemed dangerous or unfeasible. Four died during transport, although only 2 deaths were attributed to the transportation process. Our protocols called for all goats to be awake during processing.

They were mildly sedated with midazolam in the field or at the helicopter base, and later haloperidol during the processing. If an animal was too active, an additional dose of midazolam was administered at the discretion of the attending veterinarian (see Appendix 1). Most goats fared well with our treatment protocols. The primary problems were capture injuries (falls). All injuries were evaluated by project veterinarians to determine survivability; four deaths attributed to capture mortality were goats euthanized due to capture injuries. In general, if the attending veterinarians thought that the goat had a reasonable likelihood of survival based on clinical evaluation

Table 3. Goats removed from the Olympic Peninsula, Washington, 2018-2020.

Sex	Age	Klahhane	Appleton	Bear Pass	Carrie /Ferry	Chimney	Constance	Elk Lick/steel	Low Divide	Olympus	Lake Angels	Muncaster	Royal/ Wellesley	Elinor/Sawt.	Lena/Brothers	Total
Female	Adult	14	9	6	14	19	3	5	8	54	3	6	1	7	1	**150**
Female	Yearling	2	0	0	2	3	1	2	3	8	2	3	1	1	1	**29**
Female	Kid	1	2	1	1	5	0	0	3	8	0	3	0	0	1	**25**
Male	Adult	10	3	5	14	13	6	5	6	26	4	3	4	5	6	**110**
Male	Yearling	2	1	1	3	2	1	1	6	8	0	1	0	2	0	**28**
Male	Kid	5	1	0	3	1	2	1	2	12	1	2	0	3	0	**33**
Intersex	Adult	0	0	0	0	0	0	0	0	1	0	0	0	0	0	**1**
Unknown		1	0	0	0	2	0	0	1	1	0	0	0	0	0	**5**
Total		35	16	13	37	45	13	14	29	118	10	18	6	18	9	**381**

Table 4. Fate of captured mountain goats, Olympic Peninsula, Washington, 2018-2020.

Date	Total Removed	Lethal Removal	Capture Mortality	Euthanized	Zoo	Trans-located	Transport Mortality	Released
Sept. 2018	**115**	0	6	3	6	100	2	**98**
July 2019	**89**	4	6	3	0	76	(1)*	**76**
Aug 2019	**122**	4	7	0	10	101	0	**101**
July 2020	**55**	0	5	0	0	50	(1)**	**50**
Total	**381**	8	24	6	16	327	2	**325**

**1 female in very poor condition died in transport; she would have been euthanized except she had a kid at heel being transported and we tried to keep them together.*

***One succumbed during transport to capture injuries. Death attributed to capture injury, not transportation.*

it was treated and prepped for release. Transport and release crew were notified of animals requiring particularly close attention. Of these, 1 died in transport (Table 4). Other problems included goats that were either hypothermic (<36.7 °C (98°F)) or hyperthermic (>40°C (104°F)). If the capture team encountered a goat that was too hot in the field (~>39ºC (103° F)), the goat was partially dipped in a mountain lake while in the sling bag. Some of these animals became over-cooled during the flight to the helicopter base; they were treated with chemical warmers, blankets, hot water bottles, and warm buffered isotonic fluids. The few goats that arrived hyperthermic were cooled immediately with water at the helicopter base, and then treated with ice, water, and in some cases a cold-water enema at the processing table.

Sixteen kids (9 ♀, 7 ♂) were transferred to Northwest Trek in 2018 and 2019, and eventually found homes at the Cheyenne Mountain Zoo

(Colorado), Hempker Zoo (Minnesota), Oregon Zoo (Oregon), Wildwood Park Zoo (Wisconsin), or Woodland Park Zoo (Washington), as well as Northwest Trek. No kids were sent to captive facilities in 2020, due to COVID-19 restrictions and no partners in the zoo community that needed more goat kids.

Across all sessions, weights of kids and yearlings increased with capture date (8 July through 20 September), with little difference between males and females (Figure 7). Mean weight of adult female goats was 68.3 kg, with most females achieving this weight by age 3

(Figure 8). Mean weight of adult males was 107.7 kg, although mean weight of males aged ≥5 was 124.3 kg. The largest male captured (161.8 kg) was 8 years old (Figure 9).

Several lactating females caught in July 2019 were in poor condition (Harris *et al.* 2019). Consequently, we delayed the capture operation in 2020 to allow females to regain condition following pregnancy and lactation demands. This strategy appeared successful: 71% of females caught in 2020 were lactating but none was in poor condition (i.e., scored < 2). Mean weights of all sex and age cohorts caught between 27 July and 7 August 2020 were intermediate to weights observed in July and August 2019 (Table 5).

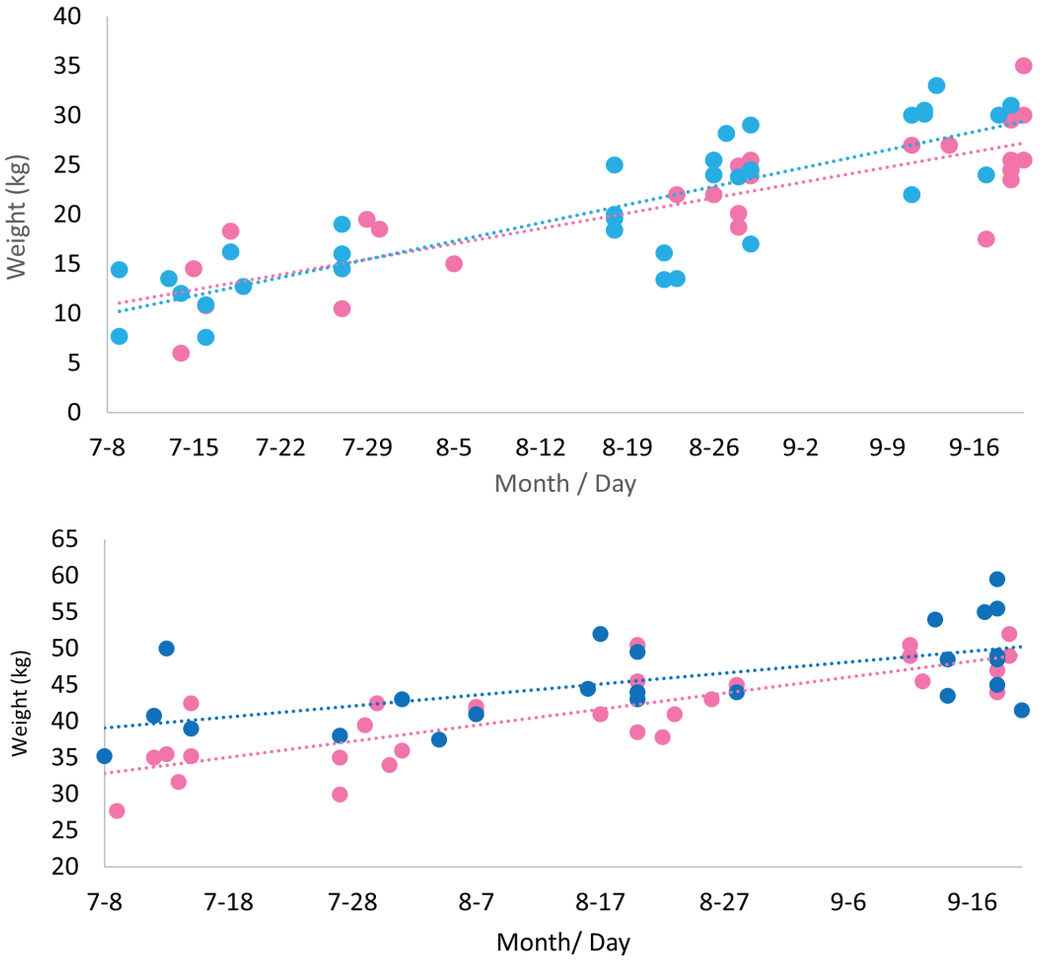

Figure 7. Weights of mountain goat kids (top panel) and yearlings (bottom panel) across all years, captured on Olympic Peninsula, Washington. Individual weights indicated by filled-in circles (females in pink, males in blue). Best fitting linear regression for each gender indicated by dotted lines. Capture dates for kids and yearlings ranged from 7/08 to 9/20.

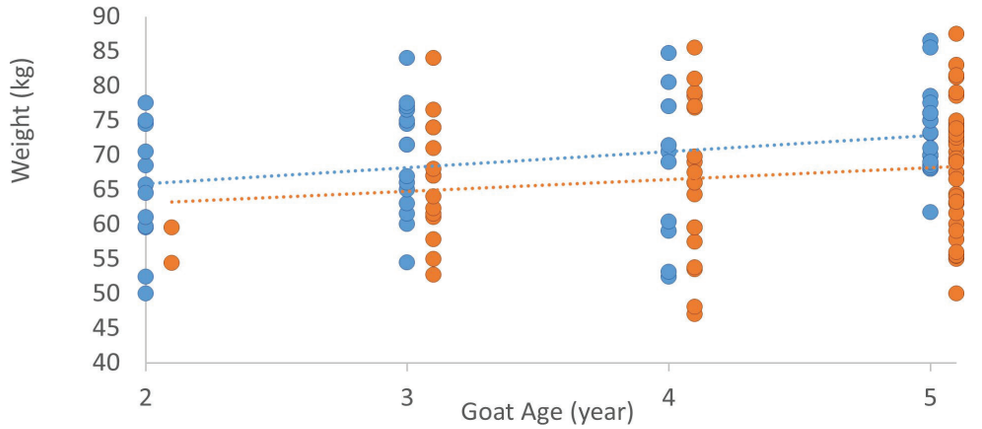

Figure 8. Weights of adult female goats captured on Olympic Peninsula, Washington, during 2018-2020, and whether lactating (orange) or non-lactating (blue). Age 5 includes goats aged 5 and older.

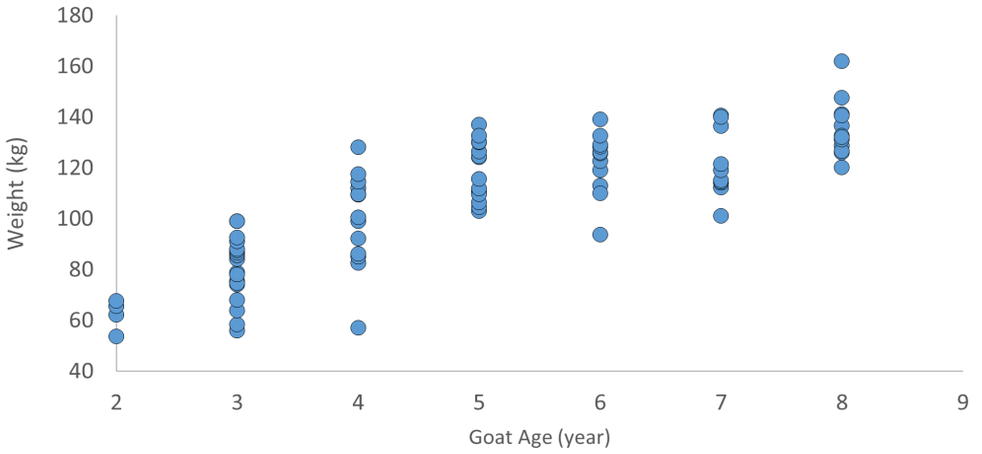

Figure 9. Weights of adult mountain goats captured on Olympic Peninsula, Washington during 2018-2020. Age 8 includes all goats aged 8 and older.

DISCUSSION

In designing the capture and processing protocols, we were very concerned about capture myopathy, and strove to design a program that kept overall capture mortality rates low while maximizing the number of goats translocated. The protocols appeared successful, as the only goats that potentially died due to capture myopathy were the two large males caught on the first day of capture.

We had to compromise between choosing capture periods when the weather was on average better and more consistently conducive to aviation, and when the goats were in better body condition. For the objective of mountain goat removal, the July and early August operational periods were optimal as that is when the weather is typically best in western Washington. However, goat condition and weights (and consequently survival upon translocation, see Harris *et al.* 2020) were better in September. Moreover, a future project constrained to this later period would risk capturing and translocating fewer goats due to the likelihood of encountering weather unsuitable for helicopter operations (needed for both capture and release). In hindsight, our choice of operating in early July (in 2018) was a poor one because so many of the adult females were in poor condition (Table 5). Considering all factors, mid to late August was the capture period when we were most successful overall.

Table 5. Weight (kg) and body condition score (1-5) of goats captured on Olympic Peninsula, Washington in 2019 and 2020. Data not recorded for all goats. (sample size).

Cohort		Mean Weight (kg)			Mean Condition Score (1-5)		
Sex	Age	July 8-19, 2019	August 16-29, 2019	July 27-Aug 7, 2020	July 8-19 2019	August 16-29, 2019	July 27-Aug 7, 2020
Female	Adult	60.4 (33)	68.3 (41)	63.4 (17)	2.3 (30)	2.7 (41)	3.1 (14)
	Yearling	34.6 (6)	42.8 (8)	37.6 (8)	1.9 (6)	2.6 (7)	2.7 (8)
	Kid	12.4 (4)	22.4 (7)	15.9 (4)	--	2.7 (6)	--
Male	Adult	101.3 (27)	111.1 (37)	105.3 (17)	3.2 (26)	3.8 (36)	3.9 (16)
	Yearling	41.3 (4)	47.6 (7)	39.9 (4)	2.1 (4)	2.4 (8)	2.4 (4)
	Kid	11.9 (8)	21.3 (14)	16 (4)	--	2.3 (12)	--

By the end of the operation, mountain goats became increasingly difficult to capture safely; during the last week of captures, we averaged only 3.75 releasable goats per day and capture mortalities rose to >11%. In areas where the terrain was more favorable for capture, we removed a large percentage of the estimated local population. However, in areas where the terrain was not conducive for capture, e.g., on the southern flanks of Mt Olympus or near Chimney Peak (Figure 6), a substantial number of goats remained. Plans call for removal of these goats through lethal means.

When we started planning this project, we faced skepticism from some members of the public that the operation could be completed safely and efficiently.

Much of the resistance was a consequence of memories of the 1980s, during which similar operations ceased due to concerns about safety. At the onset of activities in 2018, we estimated there were approximately 725 mountain goats in the Olympic range. We anticipated (National Park Service 2018) removing ~50% in the capture phase. By the end of the 4th capture session, we removed 53% of the estimated population, and either translocated or donated to zoos 341 goats. We met our objectives due to several factors. Firstly, the operation was founded on a thorough interagency Environmental Impact Statement (EIS) that had several iterations of public review, scrutiny, and consequent modification. The success of the implementation of the plan was in large part due to modern capture techniques, hard work of a highly skilled capture team, processing supervised by veterinarians and other experienced professionals, a strong inter-agency partnership, and hundreds of volunteers.

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