



United States Department of the Interior

FISH AND WILDLIFE SERVICE  
**Kodiak National Wildlife Refuge**  
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January 2, 2015

Memorandum

To: Anne Marie LaRosa, Refuge Manager

From: McCrea Cobb, Wildlife Biologist

Subject: Results of aerial survey for feral cattle on Chirikof Island, Alaska.

#### SUMMARY

We surveyed for feral cattle on Chirikof Island, on 7 October, 2014. Survey conditions were ideal; clear skies and winds <10 kts. We counted a total of 2,024 cattle (1,868 adults and 156 calves). Cattle were distributed across the island, but we noted higher cattle densities and larger group sizes in flatter habitats of the northern portion of the island.

#### BACKGROUND

The first cattle stocked on Chirikof Island were European breeds brought by Americans in the late 1880s or early 1890's (sources vary). The Semidi Propegating Company, a subsidiary of the Alaska Commercial Company, first stocked the island with seven to eight head, to supply whaling vessels and island caretakers. Arctic foxes were introduced on the island around the same time. Cattle ranching started in earnest in 1925, when a rancher named Jack McCord formed the Chirikof Cattle Company. In 1929, the Bureau of Land Management (BLM) granted McCord the first grazing lease for the island. Cattle grazing continued to the present, but as a business, it was not as successful as livestock operations closer to the mainland. Chirikof was included in the Alaska Maritime National Wildlife Refuge (AMNWR) with the passage of the Alaska National Interest Lands Act in 1980. Grazing was previously regulated by the BLM in the form of grazing leases, but when the Fish and Wildlife Service (FWS) assumed grazing management, it issued a series of grazing permits. The first FWS grazing permit for the island was issued in 1990 to a new island resident, who subsequently abandoned the ranch and left the island by 1996.

In 1988, the AMNWR Comprehensive Conservation Plan outlined the goals to restore native species and remove introduced species such as arctic foxes and cattle. Cattle, at high densities, could degrade island natural vegetation diversity and abundance and negatively impact wildlife

habitats. In 2001, FWS permitted the former rancher and a private operator to remove all cattle from the island. The attempt was unsuccessful and free roaming cattle persisted on the island. Populations are currently limited by forage abundance and likely show density-dependent fluctuations in response to winter severity.

In 2013, AMNWR began a National Environmental Policy Act (NEPA) planning process by evaluating a range of potential management actions regarding the cattle herd on Chirikof Island. As a part of the associated Environmental Assessment, updated information on the cattle population, including a survey of abundance, was needed.

## STUDY AREA AND METHODS

Chirikof Island (130 km<sup>2</sup>) is located in the Gulf of Alaska, approximately 130 km southwest of the Kodiak Island. Rolling hills in the southern portion of the island give way to flatter terrain in the north. Vegetation types were primarily grasses and sedges.

Surveys were conducted from Kodiak Refuge's Dehavilland Beaver on floats piloted by Kodiak Refuge pilot, Kurt Rees, and carrying Refuge wildlife biologist, McCrea Cobb. The passenger sat in the front right seat, next to the pilot. Both pilot and passenger served as observers.

The pilot attempted to maintain a survey altitude of 200 m above ground level. We surveyed the perimeter of the island, followed contours in more mountainous southern side of the island, and completed transects in flatter terrain. Upon encountering cattle, we tallied the total group size and the number of calves. We considered cattle as a group if they were separated by less than 500 m from other cattle and behaviorally responded to the observers in a cohesive manner. We recorded group composition and a GPS waypoint when we were either above the group or the group was perpendicular to our flight path. We considered our estimate of the cattle herd to represent a minimum population size.

## RESULTS AND DISCUSSION

We surveyed for 3.25 hrs (13:30 and 16:45) on 7 October, 2014 (Figure 1). Weather conditions were ideal for surveying: light winds (>10 mph) and clear skies. We counted 2,024 cattle (1,868 adults and 156 calves) in 112 groups, or 16 cattle/ km<sup>2</sup> (Table 1). Median group size was 9 cattle per group and group sizes ranged from 1 to 260 (Figure 2).

The observed calf: adult ratio was 8 calves: 100 adults. Comparable data on wild cattle populations are limited, but Chirikof cattle productivity appears to be substantially lower than most wild bovines. Calving rate of wild bison from stable populations under predation are generally high (66-80%) (Gogan et al. 2013). Productivity is a function of pregnancy rates, calf production, first year calf survival, and the ratio of males to females; which are highly variable and influenced by population density, forage availability, and weather conditions (Gaillard et al. 2000, Eberhardt 2002). Body condition during the reproductive season is a key factor in determining the probability of pregnancy and variability is possibly attributable to the need for females to achieve a critical body weight by the breeding season. In general, annual fluctuations in large herbivore populations are most sensitive to changes in adult female survival.

Alternatively, calf survival is usually the most temporally dynamic population parameter, responding to changes in population limiting factors.

We saw evidence of heavy grazing pressure and trampling across of the island. We observed substantial terracing by cattle on steep and exposed cliffs on the southern shores of the island. From the ground, we observed additional evidence of grazing pressure: highly eroded banks, hummocks, and denuded wetlands. Cattle feces were prevalent and we came across cattle carcasses that appeared to be in greater abundances near water bodies. However, cattle that we observed did not appear to be in poor condition (i.e., exposed ribs and minimal rump fat).

Cattle were distributed across Chirikof Island, but the highest densities and largest groups were found in the flat lowlands of the northern portion of the island. Cattle likely preferred these lower elevation areas because it is energetically easier to traverse and possibly because it offers greater forage availability and quality due to warmer temperatures and more soil moisture. Alternatively, the southern portion of Chirikof Island, especially along the coast, holds the steepest slopes and highest elevations, both of which are not characteristic of typical bovid habitat.

#### CITATIONS

- Eberhardt, L. L. 2002. A paradigm for population analysis of long-lived vertebrates. *Ecology* 83:2841-2854.
- Gaillard, J. M., M. Festa-Bianchet, N. G. Yoccoz, A. Loison, and C. Toigo. 2000. Temporal variation in fitness components and population dynamics of large herbivores. *Annual Review of Ecology and Systematics* 31:367-393.
- Gogan, P. J. P., R. E. Russell, E. M. Olexa, and K. M. Podrutzny. 2013. Pregnancy rates in central Yellowstone bison. *Journal of Wildlife Management* 77:1271-1279.



Figure 1. GPS track of survey aircraft during aerial survey of Chirikof Island, Alaska, 7 October 2014.



Figure 2. Cattle groups observed during aerial survey of Chirikof Island, Alaska, 7 October 2014.

Table 1. Cattle survey results, Chirikof Island, Alaska, 7 October 2014.

UTM E	UTM N	Group Size	Adults	Calves
335663.722912	6182278.401110	9	8	1
338149.347326	6183896.815260	1	1	0
338199.567007	6184185.774990	7	7	0
338525.015581	6184709.744010	2	2	0
339016.368333	6185103.767850	3	3	0
339241.504387	6186619.768040	10	10	0
339323.701841	6186953.550370	12	12	0
339408.959085	6187581.251690	16	16	0
339415.464652	6188005.567120	11	11	0
339185.243089	6189107.278090	2	2	0
339042.310145	6189542.174220	5	5	0
338890.311174	6190053.434600	3	3	0
338465.575495	6189527.981900	3	3	0
338770.891275	6188524.726960	1	1	0
338946.841624	6187615.490200	2	2	0
338940.955788	6186352.352870	5	5	0
337872.427899	6185680.402750	2	2	0
337980.558187	6186232.743360	1	1	0
337697.923138	6187571.923800	1	1	0
336701.920788	6188437.665170	12	12	0
336792.985336	6186870.744520	2	2	0
336805.007984	6186322.916890	2	2	0
336541.003426	6185160.368450	4	4	0
336765.848530	6184623.678670	8	5	3
337479.286982	6183825.344870	8	8	0
336755.185364	6182410.469450	30	26	4
335476.286353	6184134.552770	11	11	0
334873.554652	6184264.238310	14	14	0
334133.310836	6183872.244250	5	5	0
334337.046617	6184285.435560	20	20	0
335287.931725	6185388.776880	29	25	4
333660.975823	6186192.614110	1	1	0
334277.528193	6186840.277810	23	23	0
335128.285291	6187326.654210	7	5	2
334839.624769	6186165.981140	10	8	2
335712.223188	6188973.710100	34	26	8
336671.157620	6189376.297320	2	2	0
337135.054289	6189631.082510	10	9	1
337368.178780	6189920.348720	2	2	0

UTM E	UTM N	Group Size	Adults	Calves
337657.062504	6190141.507200	20	19	1
338782.627777	6191137.285590	11	8	3
337694.397117	6191308.001940	9	9	0
336401.914609	6190731.805000	2	2	0
336806.606278	6191749.310260	20	17	3
335602.415182	6190472.094610	10	10	0
332970.835898	6187788.139070	1	1	0
331359.570662	6185195.752290	16	16	0
332585.645556	6184950.744160	9	9	0
333420.441351	6184524.841420	12	11	1
332922.881995	6184077.399770	1	1	0
332469.734702	6184119.788770	7	7	0
331224.949932	6184795.072080	3	3	0
330890.801558	6184948.752730	13	11	2
329645.232258	6184794.477380	20	17	3
330376.157011	6185616.956640	2	2	0
330098.893788	6186100.042270	3	3	0
329274.618656	6185405.284100	8	5	3
329558.718434	6186640.685490	47	47	0
329627.858548	6186701.616090	7	7	0
330191.004348	6187151.441520	2	2	0
331296.919201	6186845.077010	45	39	6
331267.604704	6187927.160090	1	1	0
332368.315542	6188668.115310	1	1	0
333012.551336	6189816.505530	2	2	0
333894.056594	6190187.008630	10	10	0
334099.180303	6190655.661950	7	7	0
334881.847567	6191211.928700	11	11	0
336146.403977	6192125.464650	21	19	2
336740.810415	6191908.009300	17	17	0
337794.208354	6192737.679460	10	10	0
337538.897491	6193211.974430	36	32	4
335370.487918	6192285.305950	1	1	0
332080.238091	6191187.837640	15	15	0
332427.516169	6191640.164780	18	18	0
333631.234975	6192030.756020	7	6	1
334331.228676	6192070.689460	30	24	6
334164.250247	6192412.791750	6	6	0
334959.135404	6192806.677390	5	5	0
335414.853421	6192947.816600	3	3	0
335387.256669	6193816.548430	13	13	0
336020.188311	6193702.291000	8	8	0

UTM E	UTM N	Group Size	Adults	Calves
337797.483643	6193542.021430	8	8	0
337540.178781	6194173.696660	22	22	0
335925.724209	6194268.873240	89	77	12
334881.177693	6194365.801900	14	14	0
335397.912427	6194618.178050	6	6	0
334842.457165	6194606.252540	13	13	0
335009.950655	6193855.696230	25	25	0
334418.158999	6194406.491090	4	4	0
336326.287839	6195036.356850	25	21	4
337475.942093	6195356.209020	1	1	0
337806.877918	6195918.987870	27	23	4
337763.743678	6196292.005210	7	7	0
338671.559668	6196101.898950	40	40	0
338561.117412	6197437.041320	27	21	6
339567.681962	6197060.540120	23	19	4
337197.903409	6197092.901680	48	45	3
336885.573209	6197371.944620	47	47	0
337505.381958	6197745.213810	3	3	0
336919.771514	6198264.540920	33	33	0
336141.184167	6197478.934470	60	60	0
335042.691826	6195019.288720	217	167	50
330817.217267	6190734.980660	131	124	7
330770.497471	6189543.547740	260	254	6
328973.447960	6190371.334180	7	7	0
329476.435398	6190632.726070	4	4	0
330422.961854	6190711.128830	2	2	0
328576.358659	6189370.727320	31	31	0
329476.821858	6188589.566850	1	1	0
331104.732251	6188324.797580	1	1	0
330718.027470	6187851.961490	7	7	0
330207.780134	6187563.147450	21	21	0