

Aialik Bay Summary Report

Tom Smith (USGS) conducted black bear disturbance research at Aialik Bay, Kenai Fjords National Park from May 5th through May 20th, 2003. A number of persons assisted this effort including Ben Davidson and Dana Nossov (SCA), Michele Keagle and Tim Johnson (NPS volunteers), Ian Martin and Terry D. DeBruyn (NPS biologists), and Pavia Wald (NPS interpreter). Research protocols tested bear responses to direct approaches and campsites.

Bear approaches 2003

A total of 62 approaches were conducted in Aialik Bay in 2003. Sixty-one approaches were deemed useable; one was omitted due to confounding factors. These approaches were geographically distributed as follows (Figures 1 & 2):

Bear Approach Locations

Quicksand Cove: 4	North Aialik Meadows: 7	Coleman Bay: 3
West Beach: 2	Cove North of Abra: 3	Aialik Ranger Station Meadows: 2
Pederson Lagoon: 11	Abra Cove: 6	North Tooth Cove: 2
Addison Lake and Creek: 5	Aialik PUC Lagoon: 12	Tooth Cove: 1
Slate Island: 2	Aialik Moraine: 1	

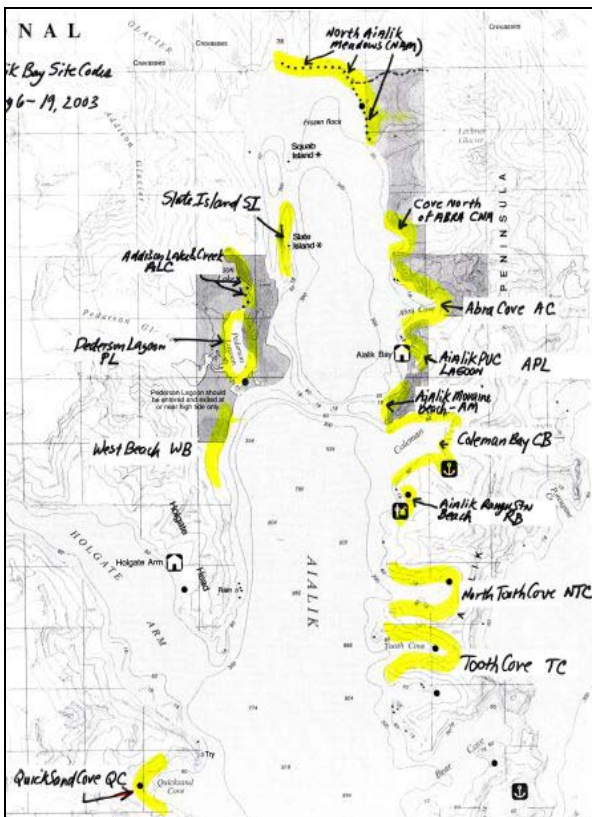


Figure 1. Aialik Bay Place Names

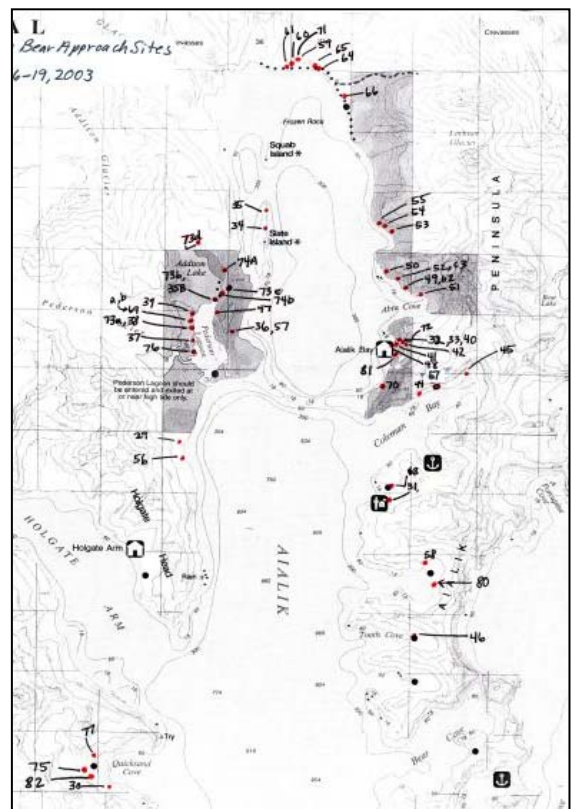


Figure 2. Approach locations within Aialik Bay

Bears we approached were subdivided by awareness level: 1) those that were well aware of our presence and had time to decide the best course of action; 2) those that were seemingly unaware of our presence even though an opportunity to detect us existed; and 3) those that had no opportunity to detect us and evaluate the circumstance. We deemed it important to subdivide approach data with regard to bear awareness levels because bears that were startled responded quite differently than those that had time to assess the situation. Of the 60 approaches conducted in Aialik Bay, 43 bears (72%) appeared well aware of our presence; 10 (17 %) appeared unaware, even though they could have raised their head and detected us; and 6 (10%) were startled as our sudden appearance a close range surprised them.

Additionally, we evaluated whether or not scent may have played in a role in bear's response or not. Based on wind direction alone, we estimated that in only 10 instances (17%) could bears have detected our presence due to the prevailing air currents. In the remaining 50 approaches (83%), winds were either from the bear to us, quartering in such a way that our scent would not have likely reached the bear, or wind was non-existent and hence would not have carried our scent to them.

Bear Approach Statistics

Approach Mode: We interacted with bears by 3 different modes of approach: skiff, kayaks, and on foot. Eighteen approaches (30%) were performed in a 17-foot inflatable power skiff; 8 (13%) were done in kayaks, and 34 (57%) by researchers on foot. The uneven distribution among these 3 categories was largely due to the fact that bears along beaches approachable by either skiff or kayak were relatively rare. A number of the foot approaches began as watercraft approaches that simply could not be carried through to completion, as we were unable to approach closer without beaching the watercrafts.

Bear Cohorts Approached: Sixty-three bears were involved in the 60 approaches in Aialik Bay. The majority were single bears of indeterminable age/sex classes ($n = 43$, 70%), followed by adult males ($n = 14$, 23%), adult females ($n = 3$, 5%), and sows with cubs ($n = 1$, 2%), Figure 3.

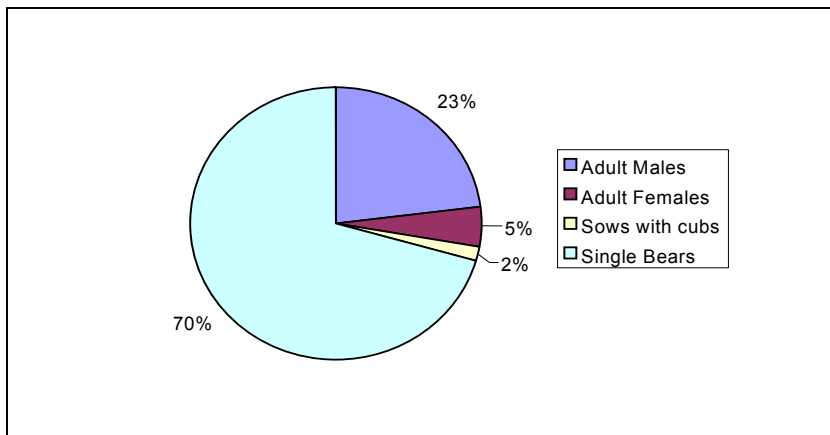


Figure 3. Distribution of bear cohorts involved in direct approaches.

There was a conspicuous absence of females with dependent young in the upper bay where most of this work took place (Figure 2), presumably due to the lack of forested habitats that provide escape terrain for young cubs. Hence we have limited information about how people may affect this cohort by directed approaches. Efforts were made to identify individual bears but black bears are particularly difficult to individually identify due to homogeneity of size and coat color. Only the largest bears with unique scarring offered opportunities for confident relocations. In spite of that, we are not certain of any repeat approaches within these 61.

Bear Activity and Habitat Use: The majority of bears we approached were actively foraging on herbaceous vegetation ($n = 42, 70\%$). The remainder were either bedded ($n = 8, 13\%$), walking ($n = 5, 8\%$), activity unknown ($n = 3, 5\%$), or actively engaged in scent marking behaviors ($n = 2, 3\%$). Not surprisingly, bears most commonly occurred in areas that provided foraging opportunities, such as in the rye grass, salt marsh, and forb-grass meadows ($n = 41, 68\%$). Bears observed in alder-willow scrub habitats were resting or traveling, although 2 bears were engaged in scent rubbing and foraging on willow catkins within these scrub habitats. Bears in forested areas were resting ($n = 1$), walking ($n = 1$) or scent rubbing ($n = 1$). Bears we approached along beaches were foraging in the intertidal ($n = 1$) or walking ($n = 1$).

Bear Responses to Direct Approaches: When approached, bears most commonly sought escape cover in alder-willow thickets ($n = 47, 78\%$) and forested areas ($n = 11, 18\%$) (Figure 4).

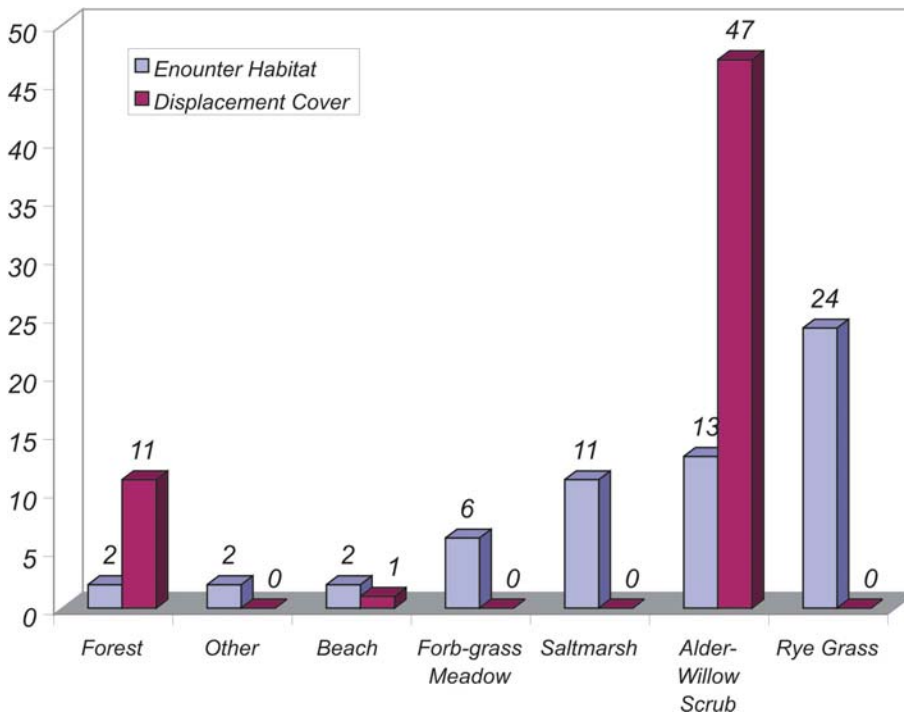


Figure 4. Distribution of bears in habitats in which they were initially observed and displaced into when approached.

Bears often sought escape by climbing steep slopes. Of 22 bears that had choices other than slopes, 18 (82%) climbed slopes rather than staying on level ground, even when dense hiding cover was nearby. We noted the distance to escape cover (e.g., dense hiding cover) in 59 approaches. The distance to escape cover ranged from 0 to 100 m with a mean distance of $10.7 \vee 22.6$ m.

If our approach resulted in a marked shift in bears' activities (e.g., a foraging bear leaves the area), we noted them as having been disrupted. Of 61 approaches 56 bears were disrupted in their activities (i.e., abandoned previous activities), 2 only slightly (i.e., temporarily put ongoing activities on hold), and 3 experienced no apparent disruption.

Of the 43 bears aware of our approach, the mean distance between us and them that elicited their first reaction was $161.8 \vee 103.9$ m. First reactions, generally a quick glance our direction followed by a brief stare, were often followed by a return to the prior activity, foraging for most. As we continued to approach these bears they eventually flushed, were displaced, from their locations. The flushing distance for these bears was $109.6 \vee 84.5$ m, and was significantly different than the first reaction distance (*Students t-test statistic* -2.414, $p = 0.009$, $df = 77$).

Of the 10 bears that we classified as unaware of our approach, the mean distance between their first reaction and us was $67.5 \vee 35.6$ m. This initial reaction distance was significantly shorter than for bears that we deemed aware of our approach (*Students t-test statistic* -2.94, $p = 0.002$, $df = 52$), but not in comparison to bears that we surprised (*Students t-test statistic* -0.48, $p = 0.318$, $df = 15$).

The mean distance at which we startled bears ($n = 6$) was $79.0 \vee 63.2$ m. There was a significant difference between the distance to first reaction for 'aware bears' and those that were startled (*Students t-test statistic* 1.89, $p = 0.032$, $df = 47$). There was not a significant difference, however, between flushing distances for 'aware' versus 'startled' bears (*Students t-test statistic* 0.847, $p = 0.032$, $df = 47$).

These data on disturbance due to approaches will be further edited and analyzed to: 1) test results between the different approach modes (foot, kayak, power skiff), and 3) test differences between areas (Nuka vs Aialik). The scope of this analysis will depend, in large part, on whether sample size requirements are met for various statistical tests.

Remote Camera Data

Two remote videotape cameras were used in Aialik Bay to monitor bear response to campsite activity. One camera was positioned on a 15 m rise at the south end of Quicksand Cove on May 7, 2003. This elevated position permitted a clear view of salt marsh habitat that extends from the southern to northern borders. This camera ran continuously for four days at which time a single tent camp was set up approximately mid-way in the meadow. This camp was surrounded by a small electric fence. A two-person crew inhabited the site for 48 hours (May 11-13), exploring about the area and

sleeping in the camp at night. After the crew left on May 13, the camera continuously recorded for 4 additional days. We removed the camera on Saturday May 17th. A brief review of videotapes indicates that the camera operated successfully during the 10-day period.

A second camera was deployed along an outer beach near Pederson Cove on May 12th. After reviewing 2 days of video recording, however, it was clear that bear activity was too low for our purposes. Consequently, on May 14th the camera was moved to an elevated position overlooking the lagoon 100 m north of the Aialik Public Use Cabin. The camera ran for 4 days, and then on May 18th we set up a single tent camp in the meadows. As at Quicksand Cove, this camp was surrounded by a small electric fence. One person occupied that camp each evening from 6 pm through 10 pm, but did not sleep in the tent nightly (due to the close proximity to the Aialik PUC). This occurred for 2 consecutive nights. This tent was removed mid-day May 20th and the camera continuously recorded ongoing bear activity in the meadow until mid-morning on May 22nd when the m/v Serac arrived to transport all crews back to Seward. A brief review of videotapes confirms that camera operation was successful, save a few hours when insufficient battery power halted recording until another could be substituted in its stead.

All videotapes will be carefully reviewed and information regarding total bear numbers, timing of use and location of use recorded. From these data a general activity profile will be created relating bear numbers to time of day. Additionally, an estimate of bear forage bout length will be obtained from the tapes. Periods where campsites were established will be compared to general activity patterns to determine what, if any, effect these campsites had on bear use in the area.