

This study focused on Huna Tlingit harvests of aquatic birds' eggs, particularly glaucous-winged gulls, in what is now Glacier Bay National Park and Preserve (GBNPP). The research was driven by three objectives:

- 1) Describe the cultural significance and historic patterns of the harvest, distribution, and use of aquatic birds' eggs by the Tlingit community of Hoonah, Alaska, and within this context document the relevance of GBNPP and environs*.
- 2) Compare existing biological information on gull colonies within GBNPP and link this with Hoonah Tlingit traditional knowledge.
- 3) Demarcate the historic and contemporary geographic areas used for bird-egg harvests by residents of the Hoonah community.

Huna Tlingit traditional tribal territory includes virtually all of present day Glacier Bay National Park, and the oral history of the Huna describes how the Little Ice Age (beginning ca. 1100 AD) first drove their ancestors out of Glacier Bay. Late 18th century accounts from explorers, scientists, and tourists document the historical and cultural significance of Glacier Bay to the Huna Tlingit. These include many encounters with Huna people actively involved in subsistence pursuits in Glacier Bay. One expedition party in 1899 was invited by a Huna group to share a meal of “gull eggs, boiled marmot and seal.”

After Glacier Bay was designated a National Monument in 1925, the Huna people remained deeply connected to the Glacier Bay landscape, and subsistence activities continued uninterrupted for many years. In 1939, the Bureau of Indian Affairs negotiated an agreement with the National Park Service that formally allowed the continuation of many Huna traditional natural-resource harvest activities. In the late 1940s, however, Park officials began to question the special privileges allowing Huna subsistence activities, and by 1974 all such privileges were rescinded. The focus of this report—the Huna's seasonal harvest of aquatic birds' eggs—is but one of many Huna subsistence activities traditionally carried out in Glacier Bay.

Of the aquatic bird species the Huna exploited for their eggs, those of the glaucous-winged gull (*Larus glaucescens*) were more frequently harvested than all other species combined. Four factors explain why: 1) Glaucous-winged gulls are common *colonial* nesters which are favored over dispersive nesters; 2) they are *indeterminate* layers, meaning they respond to the loss of eggs by laying more; 3) their nests are accessible, since they favor coastal cliffs, grassy slopes, and bare flats of small

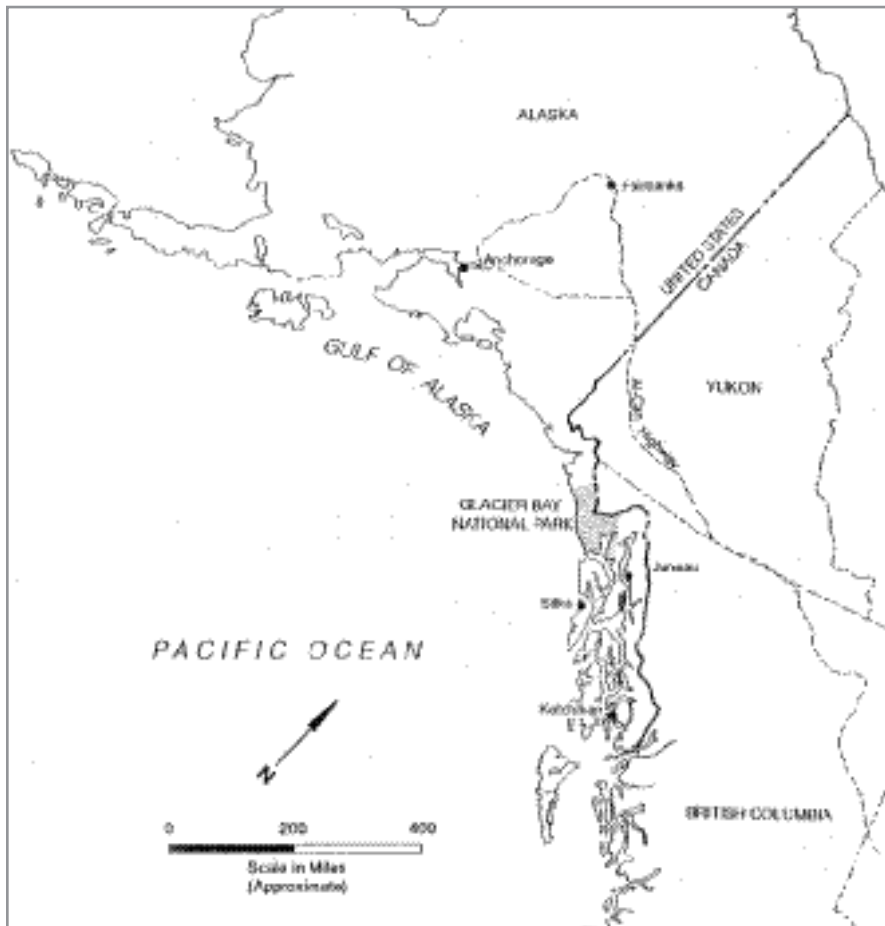
* For the purposes of this report, traditional Huna egg-harvesting practices are those recognized as legitimate by Huna Tlingit people before the 1960s. This research documents traditional practices reported by living Tlingit adults who participated in family egg-collecting expeditions primarily during the 1930s through the early 1960s. A consensus on how those harvests were properly conducted is described, as well as some alternative practices.

islands; and 4) their egg- and clutch sizes are large.

Forty-two sites were identified in traditional Huna territory where bird eggs were harvested, 33 of which lie within GBNPP boundaries. Of the 42 sites, 32 were used specifically for gathering glaucous-winged gull eggs and 25 are within GBNPP boundaries. Safe landing sites, productivity of the nesting colonies, and accessibility of nests and quality of eggs made both the North and South Marble Islands popular for egg collecting during the time period reported on by study consultants. However, the sites used for gull-egg harvests within Glacier Bay have necessarily changed over time as natural succession of vegetation has converted open nesting areas at many colonies in lower Glacier Bay into forests now unsuitable for nesting. North Marble Island, for example, no longer supports significant numbers of nesting glaucous-winged gulls.

Multiple factors served to limit the number of gull eggs taken during traditional Huna egg harvests in any given year. Most notably, the majority of traditional gull-egg harvest strategies were designed to enhance the quantity and quality of eggs harvested while simultaneously attempting to minimize impacts of egg harvesting on nesting success. With some exception, these harvests were based on fundamental knowledge of the nesting behavior and ecology of glaucous-winged gulls.

MAP 1. Glacier Bay National Park and Preserve in regional perspective (derived from Catton 1995).



The Huna people value gull-egg harvests not only for their nutritional contribution but for their capacity to sustain ties to ancestral lands and waters which are essential components of Huna identity. Egg-gathering trips each spring were important family activities, in which traditional values were reinforced and children learned from their parents and grandparents both practical and moral lessons about relationships with their natural environment and about sharing the fruits of natural-resource harvests within the larger community.

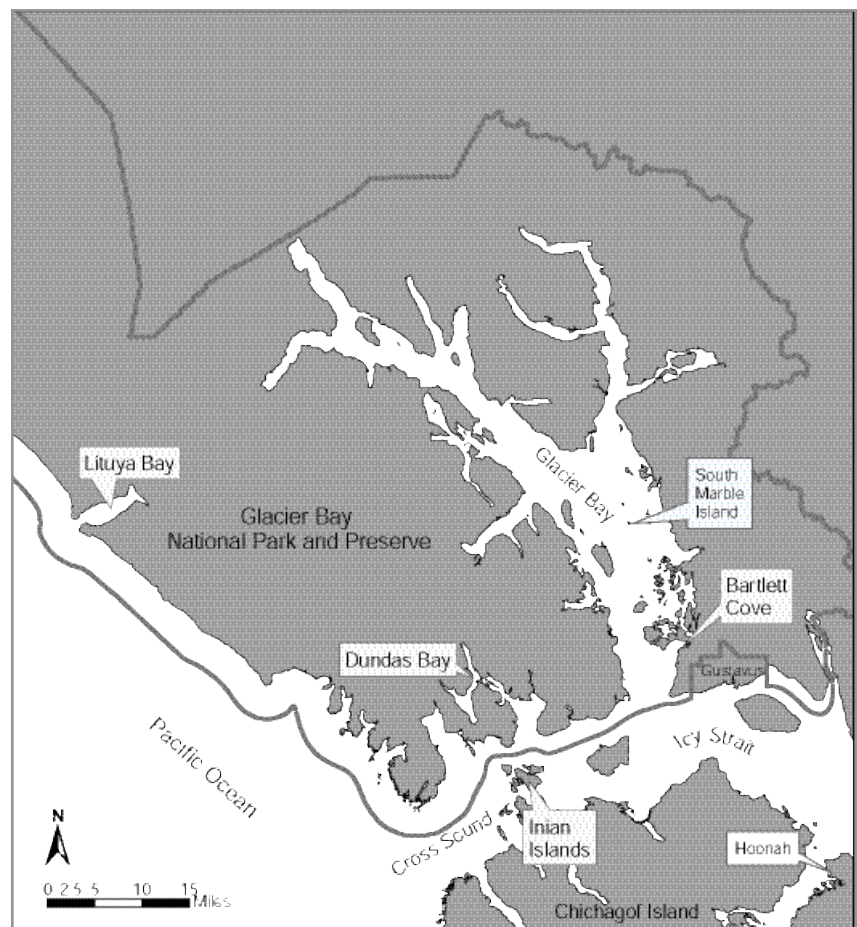
Our interview data leave little doubt that the harvest of gull eggs by Huna Tlingit people was a highly valued traditional activity which was integrated into the traditional seasonal round of hunting, fishing and gathering and that gull eggs from Glacier Bay were especially prized and widely distributed in the Hoonah community. Virtually all consultants objected, at times bitterly and emotionally, to the prohibition of their gull-egg harvests and voiced strong interest in resuming legal gull-egg harvests within GNNPP.

Many Huna Tlingit people of southeastern Alaska fondly recall how as children they went on family outings in late May and early June to the Marble Islands in Glacier Bay to harvest the large, rich eggs of seagulls. Indeed, in the mid-20th century (at least) gull-egg harvests were considered a touchstone of Huna Tlingit identity. We report here the results of a study of the traditional harvesting of glaucous-winged gull (*Larus glaucescens*) eggs by the Huna Tlingit, with particular emphasis on their harvests from gull colonies in Glacier Bay National Park and Preserve (GBNPP). Many, if not all, Huna Tlingit value Glacier Bay not only as their “breadbasket” (Bosworth 1988, Thornton 1999) but as the core of their ancestral homeland (Goldschmidt & Haas 1998). The creation of the National Monument, its extensions, and eventually the Park and Preserve have placed most Huna Tlingit ancestral lands and resource harvest areas under ever more restrictive federal control. In response, the Huna have become increasingly indignant about restrictions on subsistence and other activities within the Park and Monument boundaries.

An exact description of National Park Service (NPS) management and their interaction with the Huna Tlingit since 1925 is difficult, if not impossible, to construct. The written record is sketchy, memories dim over time, and information passed down verbally over several generations may lose its accuracy. Compared with most NPS lands in the lower 48 states, Indian title in Alaska had not been extinguished and the issue of Indian land claims was ignored when the Monument was established (Catton 1995). Catton characterizes the NPS de facto management of the new National Monument as “virtual non-management...through the 1930s” (1995:4). The fundamental reason for the lack of contact was simply that the NPS had no personnel stationed in the area.

The Monument was expanded in 1939 to incorporate the Marble Islands, primarily to protect the Alaskan brown bear. Catton reports that “Hoonah Tlingits...resisted the new regime; [and] negotiated for special privileges to continue seal hunting...” Although these harvest privileges (including those pertaining to gull egg harvests) became an issue in the 1940s (Sumner 1947), very few tourists visited the park until the mid-1960s and enforcement of restrictions on Tlingit harvests in the park were unsystematic (Catton 1995:3). Rangers were stationed at Glacier Bay National Monument

MAP 2. Close-up of Glacier Bay National Park and Preserve and surrounding area.



in about 1950. Eventually NPS management “ended seal hunting [privileges] by Natives [in 1974], promulgated regulations on vessel traffic to protect the endangered humpback whales [in 1993]” (Catton 1995:4), and began to phase out commercial fishing in park waters in 1998.

In the mid-1990s, cultural resource management personnel at the Park invited a group of Huna elders to a workshop on traditional ecological knowledge attended by representatives of the Hoonah community, the Alaska Department of Fish & Game, the National Park Service, and professional anthropologists who had worked in Hoonah. The original intent was to discuss possible collaboration on a project to gather and document Tlingit knowledge of cultural and natural resources to be used in Park management. The Huna diverted the conference proceedings when they realized they were being asked to share their knowledge without being promised anything in return. In exchange for their cooperation, they demanded that the Park restore limited harvest rights for three key subsistence foods, in order of priority: seagull eggs, seals, and mountain goats. Park officials agreed to work cooperatively with them toward a resolution of these issues. A committee was chosen from the workshop participants to specifically explore the issue of gull-egg gathering, comprised of Hoonah representatives, clan elders, tribal government officials, and NPS employees. This committee, which chose to call itself “*Woosh’ge’een*” (Tlingit for “working together”), identified the first step in this process: an ethnography of Huna Tlingit bird-egg gathering.

Consequently, the Park Service funded a study of traditional bird-egg harvests, “The Huna Tlingit Egg and Ethno-ornithology Study,” based on extensive interviews conducted in 1998 in the village of Hoonah, Alaska, as well as background research. The study was designed to fully document the Huna Tlingit’s subsistence uses of birds’ eggs, particularly harvests of glaucous-winged gull eggs, in what is now GBNPP and led to the publication of “A Study of Traditional Use of Birds’ Eggs by the Huna Tlingit,” NPS Technical Report # D-113. The interview process and other research methods are detailed in the technical report submitted to GBNPP and the Huna community and available from the National Park Service in Denver, Colorado. The current condensed report was largely derived from the technical report with the exception of some key revisions in parts 3 and 4. The Park Service also funded a counterpart study on the biology of seabirds at South Marble Island in Glacier Bay (see Zador & Piatt 1999, Zador 2001).

For the purposes of this report, traditional Huna egg-harvesting practices are those recognized as legitimate by Huna Tlingit people before the 1960s. Our research documents traditional practices reported by living Tlingit adults who participated in family egg-collecting expeditions primarily during the 1930s through the early 1960s. A consensus on how those harvests were properly conducted is described, as well as some alternative practices. After the time of our research, two gull egg harvests were conducted in the Inian Islands in 2001 and 2002 under educational permits issued by the U.S. Fish & Wildlife Service, with concurrence of the U.S. Forest Service and the Alaska Department of Fish & Game. Several photographs in this report were taken during

A general note on Huna Tlingit spelling

With one exception, the spelling of Tlingit words conforms to the accepted popular orthography (see Dauenhauer & Dauenhauer 1991). The exception concerns the uvular (or “back of the throat” consonants that in the coastal orthography are often represented by an underlined *g*, *h*, and *x*; here these consonants are rendered as *gh*, *kh*, and *xh*. Vowels with accent marks are pronounced with a high tone.

these egg-gathering trips outside NPS boundaries.

Who are the Huna Tlingit?

The local archaeological record locates human settlements dating to 10,230±800 B.P. within a few miles of the present village of Hoonah and a Tlingit ancestral cultural tradition dating to A.D. 1020±70 (Ackerman et al. 1979). The Huna recount oral histories indicating they had occupied Glacier Bay before the last glacial advance of the “Little Ice Age,” ca. A.D. 1100–1800 (Thornton 1995b). They were in the process of reclaiming ancestral resource harvesting sites when the first Euro-American explorers arrived on the scene to witness the release of Glacier Bay from its burden of ice.

One of thirteen *kwáan* or “tribes” of the Alaskan Tlingit language group or nation, the Huna of today include members of four major clans with original ties to Glacier Bay as well as members of a few additional clans. Thornton notes (1999:34):

Tlingit history relates that Glacier Bay was settled originally by what are today four distinct matrilineal clans of two reciprocating moieties: the *Chookaneidi* (“People of *Chookanhéeni*” or “Beach Grass Creek,” a reference to Berg River/Bay), the *Kaagwaantaan* (“People of the Burned House”), and the *Wooshkeetaan* (“People with Houses on Top of One Another”) of the Eagle/Wolf moiety; and the *T’akdeintaan* (“People of the *T’akdein Satan*” [a village name]) of the Raven moiety. A fifth group, the *Kuyeikeidi* (People of *Kuyeik* [Excursion Inlet]), also of the Raven moiety but now extinct (or perhaps transformed into the *Lukaax.ádi* of Haines...), reportedly dwelled at Excursion Inlet.

The village of Hoonah across Icy Strait from Glacier Bay is now and has been since earliest recorded history their primary permanent settlement. Before the 20th century, they had occupied additional winter village sites, but these have been abandoned in favor of Hoonah.

The historical process of residential consolidation at the present site of Hoonah is relevant to a proper understanding of how Huna Tlingit strategies for harvesting gull eggs may have changed since the pre-European contact period, and to the question of how the establishment in 1925 of Glacier Bay National Monument affected prior gull-egg harvesting practices. In the 19th century Huna Tlingit people apparently occupied as many as a dozen “villages,” “settlements” and “forts” distributed throughout their recognized territory (de Laguna 1990, Goldschmidt & Haas 1998). These sites are listed in Table 1.

These village sites were staging areas for subsistence harvesting. Abandonment of villages was in part a

Photograph 1. Village of Hoonah, c. early 20th century, the primary permanent settlement of the Huna Tlingit since earliest recorded history. (Photo courtesy of Alaska State Library, the Case and Draper photograph collection, 1898-1920, PCA 39-405.)



Table 1. Some Huna Tlingit settlements, villages, and forts—past and present.

settlement	tribe	name	type	status	notes
Hoonah	Oow Tsah. An	Ootshand d	M Bay	present	Originally wooded and covered by the Ootshand d clan near the base of all Hoonah dunes
Taylor Bay	Agyanzen	Tahshagan	M Bay	abandoned	Three main house camps at different times during our data... Hahshahen then now... (Ootshand d to Hoon 1990:56)
Inian Island		Ootshand d	M Bay	abandoned	Three main house houses a village on the island The Ootshand d had four houses and the Tahshagan had one... The M Bay was located at the site of the present building of the its ranch. The Hoon people left the place when the sea was now around and the M Bay would not be able to go to the island, then to pick berries" ... (Ootshand d) until after the war was established about 40 years ago [ca. 1900]... (Ootshand d to Hoon 1990:56)
Cordova Bay	L'An	Tahshagan	M Bay to the	abandoned	Three main house houses a village and then an area near camp... 904 continued to go there in recent years but now it's a village an area of 904 had a house camp. Fred Lawrence (a native of Hoon) now owned our main a gun and he can shoot and named the people in to go there." (Ootshand d to Hoon 1990:56) Western River Co. built a camp in Cordova Bay [in 1900]
Lawson Island		Tahshagan	M Bay to the	abandoned	Three main house houses a village and then an area near camp... Hoonah people have a house there... But the house was not and is not, but now it can again pick all of summer in the fall" (Ootshand d to Hoon 1990:56)
Pu. Canoe		Ootshand d	M Bay	abandoned	Three main house houses a village and then an area near camp... Two... reduced to one: "The Canoe was a permanent and an area for hunting and fishing" (Ootshand d to Hoon 1990:56). Three Oow Tsah. An and Hoon had a garden at Ootshand d (Cordova Bay) in Cordova Bay and used it until it was destroyed by the Department of the Interior" (Ootshand d to Hoon 1990:56)
Orishland		Tahshagan	the	abandoned	Three main house houses a village and then an area near camp... Three main house people who lived there now run off and their house was down" (Ootshand d to Hoon 1990:56)
Bong Bay	Ootshand d	Ootshand d	the	abandoned	"... an old house with a roof that is 10 ft high" (Ootshand d to Hoon 1990:56) "We used to have house a field on the same the same Bay Bay... 904 have all been in the house outside" (Ootshand d to Hoon 1990:56)

response to depopulation brought on by introduced disease epidemics and involvement in the commercial fishing industry (Langdon & Brakel 2001:106, 112, 121, 195–196). Additionally, several villages and camps were abandoned as a direct result of forced exclusion by whites. In particular, fox farmers reportedly preempted Huna village lands and forcibly excluded their residents (e.g., Inian Islands and Drake Island). Statements by many Huna Tlingit people indicate that they associate the beginning of their exclusion from traditional settlements within Glacier Bay with the establishment in 1925 of Glacier Bay National Monument.



Photograph 2. Huna Tlingit summer village of Khart Heenee [*Ghathéene*], translated as “sockeye salmon water,” on Bartlett Cove, Lester Island, at the entrance to Glacier Bay, c. 1888, with salmon drying on racks. (Photo by G.T. Emmons, used courtesy of the American Museum of Natural History, New York)

Huna Tlingit traditional tribal territory includes virtually all of Glacier Bay National Park as well as adjacent areas. GBNPP falls within the traditional territories of two Tlingit groups: the Huna Tlingit and the Dry Bay Tlingit. The Huna Tlingit are now largely centered in the village of Hoonah, while Dry Bay people are now largely consolidated at Yakutat. Collectively, the traditional territories of the Huna clans are referred to as *Huna Kaawu*, perhaps best translated as “Huna Peoples’ Country.” The boundaries of this territory are outlined in Map 3 which also delineates traditional territorial boundaries of the major clans (save for the *Kaagwaantaan*).

The Huna Tlingit may have numbered some 1500 before the arrival of European explorers and settlers, who brought disease in their wake. More recent U.S. Census population estimates for Hoonah show the 1910 Huna population at 625, the 1938 population at 734, the 1980 population at 680, and the 1990 population at 915, of which 622 (68%) were Tlingit.

Map 3. Huna Tlingit tribal and clan territory showing present-day area of Glacier Bay National Park and Preserve.

Historical timeline of Glacier Bay, the Huna Tlingit, and Glacier Bay National Park and Preserve

The first mention of Glacier Bay in the historic records comes from the Vancouver expedition of 1792 (Vancouver 1801) (see Table 2). Although Vancouver’s shore party described Glacier Bay as a massive wall of ice fronting the turbulent berg-choked waters of Icy Strait, they nonetheless encountered a Native group camped near the mouth of the bay (likely at Point Carolus) and seemingly at home in the inhospitable environment (Menzies 1993:148–151).

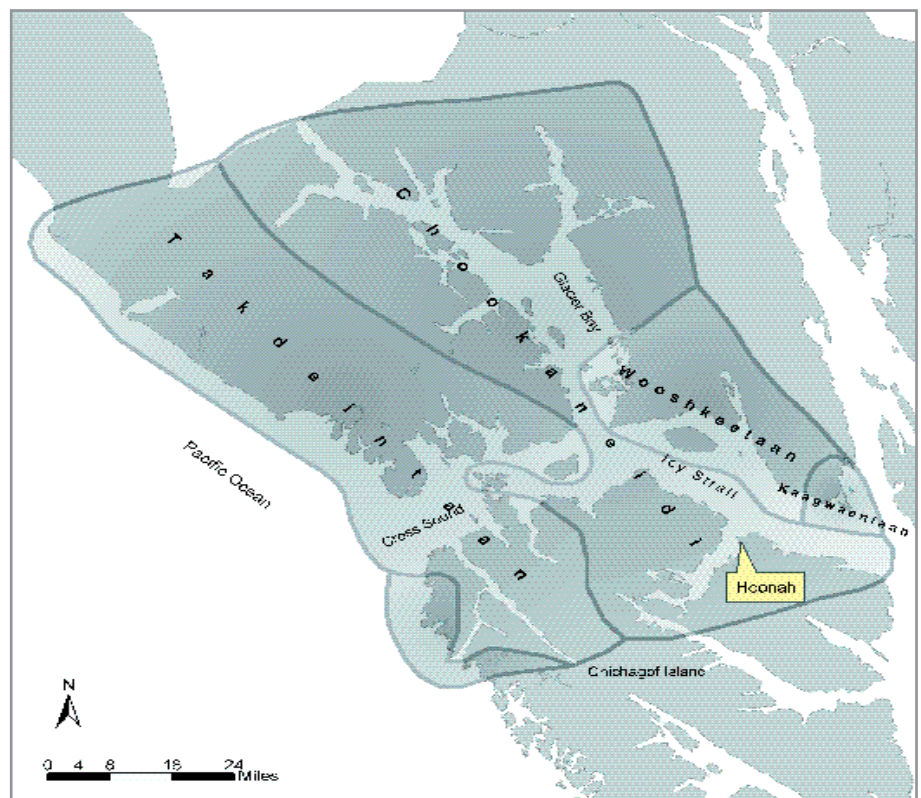


Table 2. Historical timeline of the Huna Tlingit people and Glacier Bay.

[illegible]

Naturalist John Muir ventured into the Bay 87 years later, also with Tlingit hunters as guides (Muir 1915). Glacier Bay captured Muir's imagination, and his writings and public presentations prompted others to follow. Within several years of Muir's first visit, Glacier Bay became a regular stopover for steamships carrying an assortment of scientists, explorers, and adventuresome tourists. All accounts by these early visitors mention Huna Tlingits actively involved in subsistence activities throughout Glacier Bay.

Muir's early interest was followed by a long period of scientific inquiry at Glacier Bay, with several expeditions launched to study the Bay's glaciers, geology, and plant and animal life (Kurtz 1995). In 1899, the last great American scientific expedition of the 19th century, sponsored by railroad magnate Edward Harriman, passed through Glacier Bay with an assortment of eminent scientists, artists, and photographers, confirming Glacier Bay as a natural laboratory of unsurpassed importance (Goetzmann & Sloan 1982). One party from the expedition encountered a group of Huna Tlingits in Berg Bay where they were invited to share a meal of "gulls eggs, boiled marmot and seal" (*ibid.*). Following a lobbying effort by the Ecological Society of America and an intense political battle pitting preservationists and scientists against business interests and settlers, Glacier Bay was designated a National Monument by presidential proclamation on February 26, 1925.

Tlingit society underwent profound changes during this period. The burgeoning commercial salmon industry brought about sweeping changes beginning in the late 1870s. In a few short years, salmon—the foundation of the Tlingit economy—was transformed into common property, and Tlingits were reduced from proud owners of streams and fish resources to wage-labor fishers and cannery workers (Langdon 1989). Natives found themselves increasingly isolated within their principal villages, cut off from many traditional subsistence sites being settled by non-Natives or included in federal land management units, including the Tongass National Forest and Glacier Bay National Monument. In the face of powerful pressure to assimilate, many Tlingits were able to integrate these societal changes with their traditional subsistence way of life. For example, the summer's commercial fishing activities were dovetailed with subsistence fishing, hunting, and gathering outings, and the transition to gas-powered boats meant that many of the traditional locations for these activities could be reached more swiftly.

The National Park Service had very little direct involvement in managing the Monument until the late 1930s. By this time, a host of non-Native homesteaders, miners, trappers, commercial fishers, and fox farmers had moved into the region and Tlingit culture was in a state of transition. Although the Huna were clearly involved in cash-oriented activities such as trapping, seal hunting for hides and bounty, commercial fishing, and prospecting, they remained deeply connected to the

Photograph 3. Tlingit sealers being towed in a canoe, Glacier Bay, Alaska, June 1899. Used with permission from Manuscripts, Special Collections, University Archives, University of Washington Libraries, #NA2096.



Glacier Bay landscape. Park officials noted smokehouses at the mouths of productive fish streams and Huna parties traveling to gather berries and gull eggs (see Trager 1939, Been 1940).

Beginning in the 1940s, Park Service officials moved to eliminate certain activities, such as trapping and hunting of land animals, by Native and non-Native alike. Catton reports several instances of conflict, sometimes violent, between white settlers and Huna people within and around the Monument during the 1940s (1995:120).

It seems unlikely that any arrests of Tlingits were made by NPS officials in these years [the 1940s], for certainly any such incidents would have been reported by Been or the custodian at Sitka, Ben C. Miller. Rather, it was white residents in the area who took the extension of the monument in 1939 as their cue to wreck Tlingit property and drive the Natives away with gunshots. The Tlingits invariably associated these actions with the Park Service. For example, two old Natives lived on Drake Island in Glacier Bay where the Dakdentan clan had a fort and palisade. A resident fox farmer ran the old couple off the island and tore down these structures. When the Tlingits protested, he told them the government had given him permission.

Huna Tlingits have utilized Glacier Bay for subsistence activities throughout the historic period despite legal sanctions. This perseverance is motivated by the deep spiritual connection of the Huna Tlingits to their homeland, their recognition that the most effective and meaningful way to maintain this integral connection is through subsistence activities, and their ability to adapt subsistence strategies and technologies within an ever-changing social and legal framework.

The U.S. Fish and Wildlife Service “made ‘three or four’ arrests of Huna Tlingits for ‘hunting and trapping in the Glacier Bay area’ during the winter of 1945 to 1946, which left many Huna Tlingits confused as to what they could or could not do in the Monument” (Catton 1995:121). In 1946, responding to Tlingit complaints, the Bureau of Indian Affairs (BIA) superintendent, Don C. Foster, requested a clarification from the National Park Service as to Tlingit rights giving rise to an investigation in 1947 by Park biologist Lowell Sumner who recommended that egg harvesting be excluded from the “special privileges” of the “Hoonah natives” (Sumner 1947).

According to Catton (1995), by the 1960s the legal basis for the Huna hunting privileges was “becoming obscure to the people who staffed the Monument.” In fact, the existing agreement had been drafted in 1954 by the Park Superintendent and the Bureau of Indian Affairs, allowing the Huna to gather berries, hunt seals, and carry weapons ashore for protection against bear attacks. The authorization allowing these activities was renewed in 1956, 1958, 1960, and 1962 with few modifications, but in 1964 the NPS began to take specific steps to rescind the agreement. Eventually NPS management “ended seal hunting by Natives, promulgated regulations on vessel traffic to protect the endangered humpback whales, and began to phase out commercial fishing in park waters” (Catton 1995:4).

A prohibition on the gathering of birds’ eggs, technically illegal under the Migratory Bird Treaty Act of 1918 and federal regulations, was enforced in the Monument in the early 1960s. This action strained relations with Huna Tlingits, since it formally cut them off from their favorite egg-gathering sites. At the time, other activities, such as seal hunting for bounty and commercial fishing, were allowed to continue.

With the passage of the Alaska National Interest Lands Conservation Act of 1980, most of what had been Glacier Bay National Monument

became Glacier Bay National Park. Although even authorized use by the Huna people began to decrease, Schroeder (1995) shows that Huna Tlingit harvesting activities continued throughout the Park well into the 1980s. Huna Tlingits have utilized Glacier Bay for subsistence activities throughout the historic period despite legal sanctions. This perseverance is motivated by the deep spiritual connection of the Huna Tlingits to their homeland, their recognition that the most effective and meaningful way to maintain this integral connection is through subsistence activities, and their ability to adapt subsistence strategies and technologies within an ever-changing social and legal framework.

Traditional subsistence patterns of the Huna Tlingit

Traditionally, subsistence was and is far more than an economic activity for the Huna people; it is also a “moral and religious occupation” (de Laguna 1990:209). For example, “The hunter had to purify himself [before hunting] by bathing, fasting, and continence, [and] to refrain from announcing what he hoped to kill...” (p. 210). “No animal... should be slain needlessly, nor mocked, nor should the body be wasted” (p. 209). “Fish had to be treated with respect and the offal returned to streams or burned to insure their reincarnation” (p. 210). Berries were believed to have an “inner form” or spirit (*yeik*), which must be treated with respect (Thornton 1999:36).

Traditional practice included explicit conservation provisions. “Patchy” resources of critical importance—such as salmon spawning areas, halibut-fishing grounds, and berry patches—were owned by families who monitored such resources and controlled access to them. A number of key resources were cultivated by weeding (strawberries), fertilizing (berries), transplanting (soapberries), and relocating (salmon, deer) (Thornton 1999:4; Herman Kitka, pers. comm. June 5, 1998; Pat Mills, pers. comm. Nov 6, 1998). In all these activities, sharing was of the essence: “Each woman marked her fish with distinctive cuts and kept her bundles separate in the cache, taking pleasure in sharing them with housemates or visitors” (de Laguna 1990:210).

According to Murdock’s *Ethnographic Atlas* (1967:106), fishing (including shell fishing) and marine-mammal hunting accounted for 56% to 65% of Tlingit subsistence dependence; hunting of large land animals accounted for 26% to 35%; while gathering of plants and small land animals (possibly including birds’ eggs) accounted for the remaining 6% to 15%. These proportions are probably systematically biased (Hunn 1981, Moss 1993), exaggerating somewhat the importance of hunting at the expense of gathering. Thornton’s (1999) research illustrates an important point: that the quantitative contribution of a resource to Tlingit subsistence does not necessarily reflect the cultural significance of that resource for local people. For example, berries have profound spiritual and social significance for Huna Tlingit people despite their low ranking in Murdock’s scale. Nevertheless, the quantitative predominance of fish in the Huna Tlingit diet is undeniable.

Thornton’s (1999) research illustrates an important point: that the quantitative contribution of a resource to Tlingit subsistence does not necessarily reflect the cultural significance of that resource for local people.

Hunting-gathering subsistence economies are characterized by a “seasonal round” in which families move across their traditionally used terrain in response to the maturation and movements of plant and animal resource species (Schroeder & Kookesh 1990). The Huna people fished for five salmon species, harvested July–November and dried for winter; halibut and Pacific gray cod, harvested late winter–early spring; and herring, with eggs harvested in April and rendered for oil in fall. Hunters targeted deer, mountain goats, seals as needed, and bears in late winter. Great varieties of shellfish were harvested in winter and spring, while roots and greens were available in late spring and many berries in fall.

It is important to note, however, that “[n]o one annual cycle of activities was true for all the different Tlingit local groups, and every community offered a choice of occupations at any given time, so that different families might follow different pursuits during the same period” (De Laguna 1990:206).

Photograph 4. Huna Tlingit subsistence activity - the seaweed around their feet is called Red Ribbon Seaweed, a highly prized beach food.



Photograph 5. Huna Tlingit subsistence activity - berry picking in Glacier Bay, c. 1999.

Patterns and cultural values of gull-egg harvesting

Seagull eggs had a prominent place among the traditional subsistence foods of the Huna Tlingit. Although not notable in terms of their quantitative contribution to the diet nor of outstanding ritual significance, gull eggs were nevertheless highly appreciated and are now fondly remembered for having marked a turning point in the subsistence year and for the way they brought families together. Their harvest and distribution marked a transition from the confinement and scarce resources of winter and early spring to the mobility and plenitude of summer and fall when the bulk of traditional subsistence products were harvested.

When stores ran low in early spring, a Tlingit family group would pack the canoe and venture out of the village, beginning with a seal-hunting expedition...By April, the group could be gathering green plants and edible roots or the potatoes they had planted the previous year. In May they might go on a trading expedition, followed in June by berry picking and gathering birds' eggs. (Catton 1995:18)

Gull eggs were taken between mid-May and mid-June. The timing of these harvests was critical. Given the tight synchronization of egg laying in the gull colonies (described in more detail below), optimal harvests of fresh eggs were possible for only a limited time. Gull egg collecting trips heralded the arrival of good travel weather and relief from food shortages. It was a particularly exciting time, especially for children, who participated actively in the gull egg harvests.

For many hunting-gathering peoples, food species symbolically represent the particular places where they are harvested (Hunn 1996; Thornton 1997b, 1999) and harvest places are elements of a sacred landscape. This is especially true among the Huna Tlingit, who harvest each resource with and for family, house, clan, and tribe. Huna people today view gull-egg harvests as exceptionally important, not only for their food values, but for their power to define the Huna as a people and to sustain their ties to their ancestral lands and waters.

When visitors (usually relatives) came from outside Huna Tlingit territory (e.g., Angoon, Juneau, Haines, Klukwan) to gather gull eggs, they first asked permission which was usually granted. They were most often accompanied by a Huna Tlingit, normally a relative, when they harvested the eggs.

Some boats from the other communities would come in and pick somebody up or a family, bring them up to Glacier Bay... They'd have a chance to pick seagull eggs as well. They wouldn't allow them in Glacier Bay unless they had a person or a family [from Hoonah]. (male Huna elder)

Gull-egg harvests had special social and cultural significance as an activity in which the whole family worked together, including children

Huna people today view gull-egg harvests as exceptionally important, not only for their food values, but for their power to define the Huna as a people and to sustain their ties to their ancestral lands and waters.

Photograph 6. A young Huna Tlingit man participating in gull egg harvests conducted in the Inian Islands (outside NPS territory) in 2001 and 2002 under educational permits issued by the U.S. Fish & Wildlife Service, with concurrence of the U.S. Forest Service and the Alaska Department of Fish & Game.



as young as eight years old. It was perhaps a unique opportunity for children to learn from their parents and grandparents both practical and moral lessons about the Tlingits' relationship with their natural environment, within the context of the actual harvesting.

And one of our uncles' boats would take off...would take the whole family up to Glacier Bay to gather eggs... [The children would be let off] on the hillsides with our uncles making sure we didn't go too far off the edge.
(male Huna elder)

Gathering eggs in Glacier Bay was something especially the family looked forward to. It was like Easter. Family and cousins gathered up there and we collected eggs, and it was a joyous occasion...

female Huna elder

Although not a highly ritualized activity, egg collecting provided a context in which traditional values were reinforced. Many Huna consultants indicated that egg gatherers performed private ceremonial acts before, during, and/or after the taking of gull eggs. Some said these rituals were ongoing throughout the gathering, while others indicated that they occurred at specific times.

I...remember my grandfather would put the egg up like this, looking towards Heaven and thanking the birds for the food that he found... He'd call the birds just like they were people...and he said, "Thank you for letting me find the egg for my meal today." (female Huna elder)

Although quantities of gull eggs were limited by the brevity of the harvest season (just a few weeks) and the scarcity of nesting colonies accessible to families, the eggs were widely shared within extended families and the community. When asked what happened when a boat returned to Hoonah with food, a male elder said:

When you first come in you hit the beach. That means come down and help yourself. That's the way Hoonah was... They all come down—some of them bring their pans. Yeah they know they're gonna get some—that is tradition.

Family egg-gathering outings to Glacier Bay

Sometimes people came to South Marble Island just for the day, but more often they slept overnight on the larger boats or camped on the beach at South Marble Island or nearby (e.g., in the Beardslee Islands), where they also took eggs of other bird species such as geese and ducks. Parties usually ranged in size from six to twelve.

Gathering eggs in Glacier Bay was something especially the family looked forward to. It was like Easter. Family and cousins gathered up there and we collected eggs, and it was a joyous occasion... (female Huna elder)

I remember carrying some of my little sisters and brothers on my back when we were going up there... (Huna male in his 50s).

Many people recalled wearing loose sweatshirts or sweaters that could be filled with 20 to 40 eggs. Others carried 3- or 5-gallon pails, filling one or two. People of both sexes and all ages participated in the gathering. Grass and moss were frequently collected in the nesting areas to cushion the eggs in the buckets and to protect layers of eggs. Some people mentioned using skunk cabbage leaves to line containers and to keep eggs cool.

We'd use the moss that was right there on the rocks. My dad would make

special five-gallon...coffee cans...cut the top off and he'd make a backpack with [them]. So then he'd layer the bottom with moss and we'd put the eggs on there and put another of moss and the eggs. So we'd just have layers of moss and eggs. (Middle-aged Huna female)

In earlier times, the eggs were placed in finely woven spruce-root, grass-stem, or cedar-bark baskets that were made in a variety of shapes and sizes, including ones that served as backpacks (large woven baskets are called *taal* in Tlingit). Less frequently mentioned are small bentwood boxes with handles for transporting.

Some people mentioned harvesting other foods while on egg gathering trips in Glacier Bay.

When we went after seagull eggs, we didn't only get those. We went after king salmon, sockeye, halibut, the ribbon seaweed off Strawberry Point... We would get everything all at once. And all those blue mussels, something like a clam. We used to get those by the tubful. (Huna male in his 50s)

Under the supervision of older relatives, young children were allowed to harvest gull eggs. According to a female Huna elder, Tlingit people believed that children were ready at age 7 to begin learning their peoples' history and traditional life skills. Parents, grandparents, aunts, uncles, and other relatives, including older siblings, played important roles in passing traditional knowledge and values to children. An important theme involved respect for the environment and the sacred nature of Glacier Bay.

A male Huna elder explained that if a child broke the rules, he "just wouldn't get any eggs." Another elder recalls his brother being reprimanded by his father, grandfather, and uncle for picking too many eggs with chicks. "...if people broke the rules established by the elders they might not ever be asked to go again."

...[any time] that you harvest food or you're in the sacred homeland, you are being watched by every elder that is accompanying you. (Huna female, tribal administrator, in her 50s).

Dad took us up there to gather eggs, and... while we're on our way up on the boat, they would instruct us about how many eggs to take, to respect it and not try to play with it. And like I said, it was just like a spiritual food... (female Huna elder)]

The whole Glacier Bay was respected. Always when you left there, you had to pick up your garbage from wherever you're at. You put that away or you burn it in the fire. You don't just leave it. (female Huna elder)

In the course of these outings and other experiences associated with the land, most children were taught the Huna perspective of the natural world. They learned that everything has a spirit, even rocks and trees. Indeed, the belief that all living things have a willful and watchful spirit underlies the moral basis for respectful interactions in harvesting all natural resources.

We consider a lot of things people. We talk to them [referring to the glacier, gulls, and other natural entities]

Dad took us up there to gather eggs, and... while we're on our way up on the boat, they would instruct us about how many eggs to take, to respect it and not try to play with it. And like I said, it was just like a spiritual food...

female Huna elder

Photograph 7. Huna mother and son gathering eggs on North Marble Island, c. 1960.



and confirming that each has its own spirit]. We believe there is a spirit. We [don't] know how he looked or anything. We only know he existed somewhere. Probably existed in the rock or in the mountains, in the animals in Glacier Bay or whatever. We do know he exists. (male Huna elder)

Many Huna remember individual rituals for showing respect and thanksgiving.

[In everything we do,] like gathering eggs and the same with salmon... You always thanked all your animals... your Tlingit spirit can be transformed into just about anything after they leave the human form. So it could be your relative that you're going to catch, that you're taking food from. It could be another person's relative... [E]verything has a spirit and has to be respected.]

Huna male in his 50s

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We have this inner feeling amongst ourselves that we're part of... Nature, that we're part of every living thing that's here on this earth. To offend one living thing is to offend them all... We felt as if we were walking in one of the greatest chapels in the world... (Huna male, clan house leader, in his 50s).

Besides offering prayers, some people used the first egg they found to aid them in finding more eggs. One elder remembered people in his family rubbing the first egg found on their foreheads:

To be led where the eggs are [and then placed it on their eyes]. So you will be able to get a clear vision of where the eggs are... (male Huna elder)

The Huna Tlingit believe that lack of respect brought punishment by the spirits, which might include consequent lack of success in finding food.

If we respect it, we'll always have an abundance of food. And if you abuse it, the spirits will go against you and then next time you go, there won't be any... So you always have to respect it or something bad will happen to you or a family member. You'll be punished for being abusive... So that's what they taught us. (Huna male leader, was then mayor of Hoonah, in his 50s)

The Huna Tlingit also believe that the natural world may punish a disrespectful person.

Something happens to them... If you don't listen to what you're told, you either break your arm or leg or you fall off [the cliff]. (two female Huna elders)

One Huna consultant explains respect, how it is shown while gathering eggs, and what it all means to him:

I give a Tlingit prayer and I face the four corners of the Earth which are the posts of the earth... Nature's four corners, and give a prayer of thanks that I am going to take this portion of the eggs to nourish my body... My parents taught me what we've been doing for thousands of years, that we walk on Earth with total respect for even the rock that holds you up. And it isn't just that... I respect you because you are a human being. I was born into this world with respect and I was taught respect... I will leave it with nothing but respect, and that is what I try to pass on to my son... If I don't pray I have a life of disrespect for myself. The creator of Earth created [a means] for us to be comfortable and for thousands of years our people have been comfortable here... When I enter Glacier Bay I have this overwhelming feeling of home. [And I say] thank you, Lord... This is my home. This is me... (Huna male in his 40s).

Customs of sharing and consuming gull eggs by Huna Tlingit

The social significance of sharing, preparing, and consuming gull eggs are as important as the familial and communal gathering of eggs. As noted earlier, gathering gull eggs on the Marble Islands largely involved family outings. Just as everyone participated in the gathering, people of both sexes and all ages shared in the cooking and shelling of eggs and packing them for transport back to Hoonah, with no rigid definition of tasks. Of course, Huna people were usually very hungry for the eggs and some were cooked and eaten at picnics on the islands or on boats. Eggs were frequently delivered to a central point on the South Marble Island beach where some worked on the eggs and made a fire for boiling them. One elder recalled that the men often cracked the eggs all the way around and the women and children removed the shells. According to one consultant, adults would usually eat a serving of four or five eggs, and children would eat three or four.

Eggs harvested in Glacier Bay were carried back to Hoonah to be shared with relatives and others not able to make the trip. Several temporary methods were used to keep the eggs cool and to prevent spoilage, including packing them with glacial ice that floated in the Bay and wrapping them in skunk cabbage leaves, grass and moss, or other natural materials.

Most eggs were apparently shared among kin, especially favorite elders who were fond of them. However, there was also a strong ethic of community-wide sharing, and most people did so. People who had no close kin who were gathering eggs in any given year probably also received some gull eggs, if they wanted them.

You give it to anybody—you have a friend, maybe give them four eggs. Oh, they're happy to get it... (female Huna elder)

So when we helped people, we were told not to ask...the reason...because these people we helped might not have any money. And they might have to dig too deep to pay you. It might hurt them too much. And so this is why when we give seagull eggs, we never ask for money. We come and say Auntie, look what we got for you. And we'd give them eggs. (Huna male, clan house leader, in his 50s).

Huna consultants emphasized that elders were given priority when eggs and other food was distributed.

The elders are respected by the Huna Tlingit because they are regarded as teachers and because they taught and carried on the traditions of our culture. (male Huna elder)

Gull eggs were also saved for special occasions, sometimes to share with special friends.

When we first got eggs my grandpa would eat maybe one or two. He used to say, we'll save this for a special occasion. [When asked what a special day was he said:] Maybe decide today is a good day to eat an egg, you know. Yeah, [with] a special friend. (male Huna elder)

Many consultants reported that gull eggs were used as a healing food.

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When my mom was dying...she was hungry for some seagull eggs, so my boy—they couldn't go to Glacier Bay to get it, but they found some places off the islands where they got them... They took a skiff out there and jumped off on the rocks while they were going up and down the big swells. And they jumped back on when they got their bucket or two buckets' full. And my mom was real sick. She couldn't eat anything. Couldn't stomach anything. But after we cooked the seagull eggs for her, she ate about four of them. And she felt real happy and good... (Huna male in his 40s).

There's a tea that you can boil it with... Once the tea is made you just crack your egg in the tea. In fact, I had a cold one time in Glacier Bay and it was given to me for medicinal purposes. (Huna male in his 40s)

Some families apparently traded gull eggs to people outside the village for other products of nutritional importance.

...people would come down with some of their dried and smoked fish. Or people from Haines and Klukwan would come down with smoked hooligan, and they'd trade for seagull eggs. (male Huna elder)

One consultant said they sold gull eggs to people who worked in Icy Strait Cannery at a time when seining started early, thereby preventing cannery employees from harvesting eggs themselves.

Nutritional contributions of gull eggs to the Huna diet

As de Laguna (who worked in Yakutat) notes, gull eggs were “a treat” rather than a staple element of the diet (1972:395). Because we felt their contribution should be better understood, we estimated the nutritional value of a single glaucous-winged gull egg by extrapolating from values published for domestic chicken, duck, and goose eggs, based on a standard 100-gram sample (see Hunn et al. 2002). We calculated a series of volumetric ratios for the various wild bird species reportedly targeted for their eggs by the Huna Tlingit. For a nutritional standard, we took the average of the available figures for chicken, duck, and goose eggs (Watt & Merrill 1963). For minimal daily requirements for humans, we used averages of the values recommended by the National Academy of Sciences (NAS 1974), for males and females ages 23–50, for Kcal, protein, Vitamin A, calcium, phosphorus, iron, thiamin, riboflavin, and niacin. According to our calculations, on an annual basis gull eggs clearly could have provided only a tiny fraction of the total Huna Tlingit food energy requirement. If a maximum of 9600 gull eggs (the BIA figure for 1943 in Catton 1997) were actually available per year for a Huna Tlingit population of about 600, the egg harvest would have provided about 0.3% of the community's total annual food energy requirements.

Cooking and preserving gull eggs

In Hoonah, especially in recent times, most eggs were cooked in boiling water and eaten on the spot. The shells were sometimes put in the soil in local gardens. The most popular way of eating a boiled egg was by

dipping the shelled egg in seal oil.

We'd dip it in seal oil and turn it upside down so the seal oil runs down it and then we'd salt it. (male Huna elder)

Other more modern ways of preparing gull eggs were to scramble, poach, and fry them. Some were used in baking, as gull eggs made a superior cake.

... I bake cakes with them and ... the color is almost a bright orange. It's so pretty, and it raises up and you use only one egg where you would use two chicken eggs. They are a very rich egg. (female Huna elder)

Several consultants described traditional methods of preserving gull eggs, some claiming that supplies of preserved eggs might last until late winter. Others said that gull eggs in their households would all be eaten by November, if not sooner. According to the Huna interviews, few gull eggs are preserved in Hoonah today, but virtually all consultants agreed that egg preservation was important and routine earlier in the century, before the introduction of refrigerators and freezers and when more gull eggs were collected.

Several methods of preservation were described by Huna consultants. These may represent distinct family traditions. The most commonly reported practice was for hard-boiled eggs to be preserved in bentwood boxes made of yellow cedar or spruce and covered in seal oil.

[The seal oil has] gotta be fresh. Before when the egg season was coming close...the guys used to have this hunting trip and get the seal fat. And the ladies used to cook it, render the oil, and after it's pure and cold, they just keep it for the egg-picking time. (female Huna elder)

My grandmother...used to cook it first and peel it and then put in the seal oil... And it'd have to be in real fresh grease. Freshly kill the seal and then render the fat... (female Huna elder)

The boxes of oil-covered eggs were kept in a dark, cool place.

And our people back then had the bentwood cedar box. Waterproof. And when [the egg was cooked and shelled] they would pour seal oil into that box which is waterproof and place their eggs in there. And all through the winter months if you picked enough you can eat hard-boiled eggs. (male Huna elder)

A few people remembered their families preserving eggs by slicing the shelled, hard-boiled eggs very thin and drying them on rocks, but many other people had not heard of this approach. After commercial salt was introduced, some families began preserving the boiled, unshelled eggs in a brine solution.

He used to get moss by the trees. We'd just shake them off so there wouldn't be no insects or anything in there. We lay it out and let it dry. And he used to get those wooden boxes or orange crates...and he layers them with that moss and salt...and then we lay the eggs, salt at the bottom and on top and then the moss. Just by layers. And they keep. And you just keep them in one place. Don't move them around... And they...used to keep until late November... in a cool place. (female Huna elder)



Photograph 8. Huna father and son boiling eggs in their boat on an egg-harvest outing, c. 1960.

According to a male Huna elder, another way of preserving eggs was to dig a hole in a stream, line the hole with moss to protect the eggs, and cover the eggs with gravel and rocks. Sometimes a dam of rocks was made to keep the eggs in place. Five or six distinct preservation methods were reported, suggesting that in the past larger numbers of eggs were harvested and that they played a more prominent role in the local diet and at social events than in the memory of most Huna consultants.

Widespread distribution of gull eggs as a delicacy in Hoonah

Five or six distinct preservation methods were reported, suggesting that in the past larger numbers of eggs were harvested and that they played a more prominent role in the local diet and at social events than in the memory of most Huna consultants.

Estimates of glaucous-winged gull populations and eggs available for harvest, as well as ethnographic material on the social dimensions of gull egg harvests, support the claims of Huna consultants that gull eggs from Glacier Bay were widely appreciated as delicacies before access to nesting colonies was formally denied. We calculated the possible distribution of gull eggs among Hoonah households based on one consultant's estimate that a single individual typically filled one 5-gallon pail during a single visit to the nesting colony (see Hunn et al. 2002). We inferred that an average party size of nine would have gathered about 240 eggs and, after consuming some eggs on the trip and allowing for broken or discarded eggs, would have carried about 128 eggs back to Hoonah for use as fresh eggs, for preserving, and for sharing. If each party was composed of two households and they each kept two dozen eggs for their own use, about 80 eggs could have been shared with relatives and friends. Thus, one egg-gathering trip would have provided eggs for consumption by about nine households. If each gathering household kept only one dozen eggs and shared about two dozen, the distribution may have doubled. In other words, 16 households would have distributed eggs to about 56 households for a total of 72 households receiving gull eggs.

It is difficult to estimate the number of gull eggs that may have been available in Glacier Bay for harvest during the time period reported on by our consultants (see Table 6 for a hypothetical estimate of "surplus" eggs available on North and South Marble Islands, assuming 1000 nesting pairs of gulls). We believe, however, that during the 1920s, 30s, and early 40s gull nesting populations were likely much greater in Glacier Bay. Bailey (1927) observed that nesting glaucous-winged gulls were especially abundant on Willoughby Island, that they nested in the Beardslee Islands by the thousands, and that gulls nested in "considerable numbers on the glaciated points projecting into Muir Inlet close to the glacier and on the desolate glacial moraines." Currently, however, neither of these locations support sizeable gull colonies presumably due to their recent forestation.

In summary, our calculations, although speculative, suggest that a minority of Hoonah families could have visited Glacier Bay in any given year to gather eggs, and that if 2000 gull eggs were available for harvest, they could easily have widely distributed them among the Hoonah community as a cherished delicacy. Our ethnographic material is consistent with this conclusion, since consultants frequently

mentioned that not all children were selected to go and that to be selected was an event of great importance. Also, apparently not every adult gathered eggs every year and some families were much more involved in the actual egg gathering than others, one reason being that not all families owned boats large enough to make the trips with several people.

The overall context of seabirds in Glacier Bay

According to the latest “Bird Checklist” by Glacier Bay National Park and Preserve (Paige 1986), 39 species of *aquatic* birds may nest in the Park, out of a total 223 bird species reported since formal bird observations began. Yet significant egg harvesting was unfeasible for

Photograph 9. A young Huna Tlingit man returning after gull egg harvests conducted in the Inian Islands (outside NPS territory) in 2001 and 2002 under educational permits issued by the U.S. Fish & Wildlife Service, with concurrence of the U.S. Forest Service and the Alaska Department of Fish & Game.



Table 3. Aquatic bird species known to nest, or suspected of nesting, in Glacier Bay National Park (GBNPP 1986) and of being harvested by the Huna Tlingit.

SPECIES	TUNGIT NAME	A	NESTING PATTERN	EGG-SEE RATIO TO CHICKEN ^a	MODAL CLUTCH SEE
Petrel cormorant	peetli	a	colonial	0.95	3-5
Canada goose	kaawidli	u	colonial	2.95	5-7
Mallard	kinaabikwani	c	dispersed	1.14	10-12
Black oystercatcher	legie	c	concentrated	1.00	2-3
Wren gull	kood'at'at' kood'at'at'	c	loosely colonial	1.13	3
Herring gull	kink'at'	u	colonial	1.89	2-3
Glaucous-winged gull	kink'at'	c	colonial	2.24	3
Black-legged kittiwake	ko'at'at' ko'	c	colonial	1.11	2
Arctic tern	kis'gaat'	c	colonial	0.39	2
Pigeon guillemot	gi'at'at'at' kare	a	concentrated	1.20	2
Tufted puffin	at'it'	u	colonial, in burrows	2.03	1
Horned puffin	leg'at'at' / leg'at'at'	c	colonial, in burrows	2.03	1

* Domestic chicken volume ratio = 1.0

A = abundance during nesting season: a = abundant, c = common, u = uncommon, r = rare.

Nesting patterns are abstracted from information in Ehrlich et al. (1988) and Baicich & Harrison (1997).

most of these species, either because they were rare, their populations too small or too widely dispersed, or their nests inaccessible. Of these 39 nesting species, twelve were unambiguously identified as providing harvestable eggs. These species are described in **Table 3** in terms of abundance during the nesting season, nesting pattern, clutch size, and egg size.

Of the species the Huna reportedly exploited for their eggs, glaucous-winged gull eggs were more frequently harvested than all other species combined. Apparently, four factors account for the Huna's preference for this gull's eggs over those of other equally common nesting species: 1) Glaucous-winged gulls are *colonial* nesters which are favored over *dispersive* nesters such as loons, many ducks, shorebirds, and the parasitic jaeger, 2) they are *indeterminate* layers, 3) their nests are *accessible*, and 4) their egg- and clutch sizes are *large* (see Photograph 11). Only Canada geese have larger eggs than this gull, and of the rest only the puffins come close to it in size. Although Canada geese lay an average of 5–7 eggs per clutch, compared to 3 for the glaucous-winged gull, they do not nest in dense colonies and they hide their nests well.

Nesting behavior

Glaucous-winged gulls are colonial nesters, preferring to nest on “coastal cliffs, grassy slopes, bare flats esp. on small islands” (Ehrlich et al. 1988:176). Egg laying within the colony is tightly synchronized. Patten suggested, “...colonial nesting and synchronization of egg-laying have an anti-predator function” (1974:38). He noted that at the North Marble Island colonies, “[I]ncubation did not begin until after the clutch of three was completed, about a week after the first egg was laid. The onset of incubation was also synchronized in all colonies, and began immediately after the peak egg-laying week” (1974:40).

Large gulls are “indeterminate layers,” that is, they “respond to the loss of eggs by laying more” (Ehrlich et al. 1988:165, cf. Kennedy 1991; Zador 2001:2). Baicich and Harrison state that a full clutch of glaucous-winged gull eggs is “usually 3, often 2, rarely 4” [of which the latter may represent nests tended by two females (Reid 1987:8)]; a herring gull clutch is “usually 2–3” (1997:155, 157). Patten's study of 353 nests at North Marble Island colonies of glaucous-winged gulls reported average completed clutch sizes of 2.80 in 1972 and 2.96 in 1973 (1974:27). He noted that “the optimum clutch size in the herring, glaucous-winged, and western gulls is evidently around three but, as in other species, there is probably some variation in the

Photograph 10. Glaucous-winged gulls (*Larus glaucescens*).



optimum number from locality to locality as well as from year to year” (Patten 1974:41–42). Zador (2001:24) reported that the control nesting sample in her study laid a higher percentage of three-egg clutches in 2000 (74%) than in 1999 (64%). She also observed that “Gulls began laying eggs an average of 6 days earlier in 2000 than in 1999... and laid significantly more eggs on average in 2000” (Zador 2001:13). Combining data from non-manipulated nests for 1999 and 2000 ($n = 291$), she observed that 68% laid three-egg clutches, 20% two-egg clutches, and 11% one-egg clutches.

Once the female begins to lay (typically one egg every other day), she will continue laying until she has a full clutch of three eggs (less often one or two) (Zador 2001). When this clutch size is achieved, her capacity to produce new eggs shuts down. “The onset of incubation [sometime after the second egg is laid] probably causes developing follicles to atrophy...and ovulation to cease” (Kennedy 1991:110). Experiments with various gull species have demonstrated that if eggs are removed before incubation begins, the female will continue laying. An experimental study of the closely related lesser black-backed gull (*Larus fuscus*) showed that these gulls “were capable of producing, on average, almost three times the normal clutch of three eggs.” To be precise, the mean number of eggs induced was 8.59 ± 0.61 eggs over a period of 23.5 ± 1.9 days. One individual laid 16 eggs (Nager et al. 2000:1343).

If all the eggs are taken or the nest is destroyed, a female may re-nest after an extended period of recuperation (see Ickes et al. 1998; Zador 2001). Gull population control experiments have indicated that glaucous-winged gulls will initiate a new egg-laying cycle about 12 days following destruction of a completed clutch (Ickes et al. 1998; Zador 2001). Shugart and Scharf (1976) documented extensive re-nesting in a Michigan herring gull colony after heavy predation by red foxes (*Vulpes fulva*).

Patten reported finding “no adverse effect on egg hatching resulting from interrupted incubation due to my presence [about once every four days]” (1974:40). He noted, “The loss of eggs through predation was the principal factor influencing hatching and fledging rate in both years” of his study (1974:43), the principal predator being other gulls in the colony, although he also observed egg predation by ravens, crows, and eagles.

Despite disturbances by predators, Patten measured an average fledging success rate for the North Marble Island colonies of 1.75 to 1.80 per nest, compared with an estimated 0.92 chicks fledged per nest considered “sufficient to maintain a stable population” of herring gulls at another colony (Patten 1974:64). “The gulls on North Marble are reproducing with more than enough fledging to sustain the population... [T]he high reproductive success accounts for dispersion of young breeding adults to recently deglaciated areas and colonization of marginal sites.” Zador (2001) reported

Photograph 11. Glaucous-winged gull nest with three-egg clutch on cliffs of South Marble Island, c. 1998.



similar hatching rates in unmanipulated nests of 1.61 ($n = 151$, 1999) and 1.81 ($n = 140$, 2000); however, she did not report fledging success rates.

Impacts of Vegetative Succession on Nesting Sites

Patterns of vegetative succession on the heels of glacial retreat in Glacier Bay have been analyzed in detail (cf. Cooper 1923, Lawrence 1958, Reiners et al. 1971). Three broad physiognomic community types are distinguished subsequent to the emergence of bare rock or soil from beneath the retreating glacier. The *first* stage is the “pioneer community” of low herbaceous and woody mat vegetation that is well suited to gull nesting, other things being equal. The *second* stage is a “willow-alder thicket” that most likely precludes gull nesting and that, in turn, is overgrown by the *third* stage, a young Sitka spruce forest (Cooper 1923:225). According to Reiners et al. (1971:56), the mat community may develop 5–20 years after exposure of the substrate, the shrub-thicket stage at 20–40 years, and the spruce forest at 75–100 years (1971:56). However, the rapidity of the transition from bare rock through these three stages varies according to substrate, i.e., most rapid on slate and argillite substrates and slowest on limestone and marble surfaces, particularly those that are steep and/or with few crevices (Cooper 1923:234).

The more favorable spots, such as level or depressed areas, or surfaces with many crevices, soon become covered with a luxuriant turf-like growth...by increase of the shrubby species such areas are rapidly converted into thickets in which alder and willows are dominant, while the adjacent steeper and smoother surfaces are still bare of plants. Such is the condition today upon the limestone islands of the lower bay, Drake and Willoughby. The spruces, thickly scattered upon the meadow and thicket areas, indicate the future course of development” (Cooper 1923:234).

Cooper does not mention the Marble Islands, but as their name and location suggest, they most likely are composed of the smoothest rock surfaces most resistant to weathering and invasion. Drake and Willoughby Islands (described by Cooper as “*roches moutonnées*”... “being carved of solid rock” [1923:97]) supported glaucous-winged gull colonies until the mid-20th century, but are now too overgrown. North Marble Island has undergone the same fate somewhat more recently (i.e., since Patten’s studies there in 1973–1974). If and/or when the South Marble Island colony site becomes overgrown with vegetation is uncertain, although it has remained bare enough to allow a gull-nesting colony approximately since the mantling glaciers retreated.

Non-Human Predators

Patten reported, “[Bald] eagles disturbed the North Marble Island gull colonies repeatedly. The approach of an eagle caused immediate high-intensity alarm calls and flight of the entire colony at once” (1974:52–53). Zador (2001:13–15) also noted substantial predation by bald eagles at the South Marble Island colony in 1999 and 2000,

Zador (2001:27) suggests that the forest on South Marble Island “appears to facilitate eagle predation by providing perches in sight of the colony areas.”

although the patterns of eagle predation differed between years. In 1999, eagle predation was observed throughout the incubation period; in 2000, predation was much less frequent until about a month after the first gull eggs appeared. Bald eagle populations have increased dramatically throughout North America in the past few decades. Thus, the intensity of eagle predation at the South Marble Island colony may be a recent phenomenon.

Zador (2001:27) suggests that the forest on South Marble Island “appears to facilitate eagle predation by providing perches in sight of the colony areas.” Non-human predation today may potentially disrupt gull nesting more than traditional Native American harvests.

The impact of eagle predation on the South Marble Island gull colony should therefore be carefully monitored so that this impact is included in assessments of the feasibility of resuming traditional harvests by the Huna Tlingit.

Predatory Impacts

Zador (2001:35), summarizing the literature on deliberate attempts to reduce gull populations, not surprisingly observed that egg removal by humans has been shown to result in population reduction.

One management project removed herring gull eggs every one to three weeks over the course of three consecutive breeding seasons. Although the gull population continued to nest, the maximum number of nests during a visit declined 67%. At a second colony, egg removal at one-week intervals for two consecutive breeding seasons caused a 57% decline in the maximum number of eggs (Ickes et al. 1998). Response to egg removal can vary among species. Intensive egg removals from herring and lesser black-backed gulls appeared to more successfully control the herring gull population than the black-backed gull population (Wanless et al. 1996).

Zador’s (2001) experiment conducted on South Marble Island tested hypotheses relating to measurable effects of egg removal during the hatching stage, including physiological effects of re-nesting on females. Her results showed “evidence of some physiological response to re-nesting that would not have been seen in the more common measure of bird quality such as body condition and hatching success” (2001:32). Specifically, females forced to replace clutches showed a different physiological response to acute stress. However, this response apparently did not affect their ability to incubate or compromise their hatching success (Zador, pers. comm., Nov. 10, 2003).

Although Zador (2001) concludes that hatching success was similar between her two experimental groups (one egg removed on the first day it was laid and three eggs removed on the day the third egg was laid) and control groups (no eggs removed), she states that there may be “future effects on the resulting chicks beyond the scope of [her] study” (i.e., beyond the hatching stage) (2001:34).

Daan (1986) described a pattern of declining fledging success and post-fledging survival as a function of laying and hatching dates. This pattern has been observed in larids. The time required to lay replacement eggs necessarily delays chick-hatching dates. Although late hatching led to lower survival rates for glaucous-winged gull chicks, the relationship was not strong when food supply was high (Hunt & Hunt 1976). Herring gulls hatched from replacement clutches have been found to suffer higher post-fledging mortality (Nisbet & Drury 1972). Hatching late was not found to affect post-fledging survival in common terns (Nisbet 1996, Becker 1999). However, black-headed gull chicks that hatched last began breeding at an older age (Prevot-Julliard et al. 2000) (Zador 2001:34).

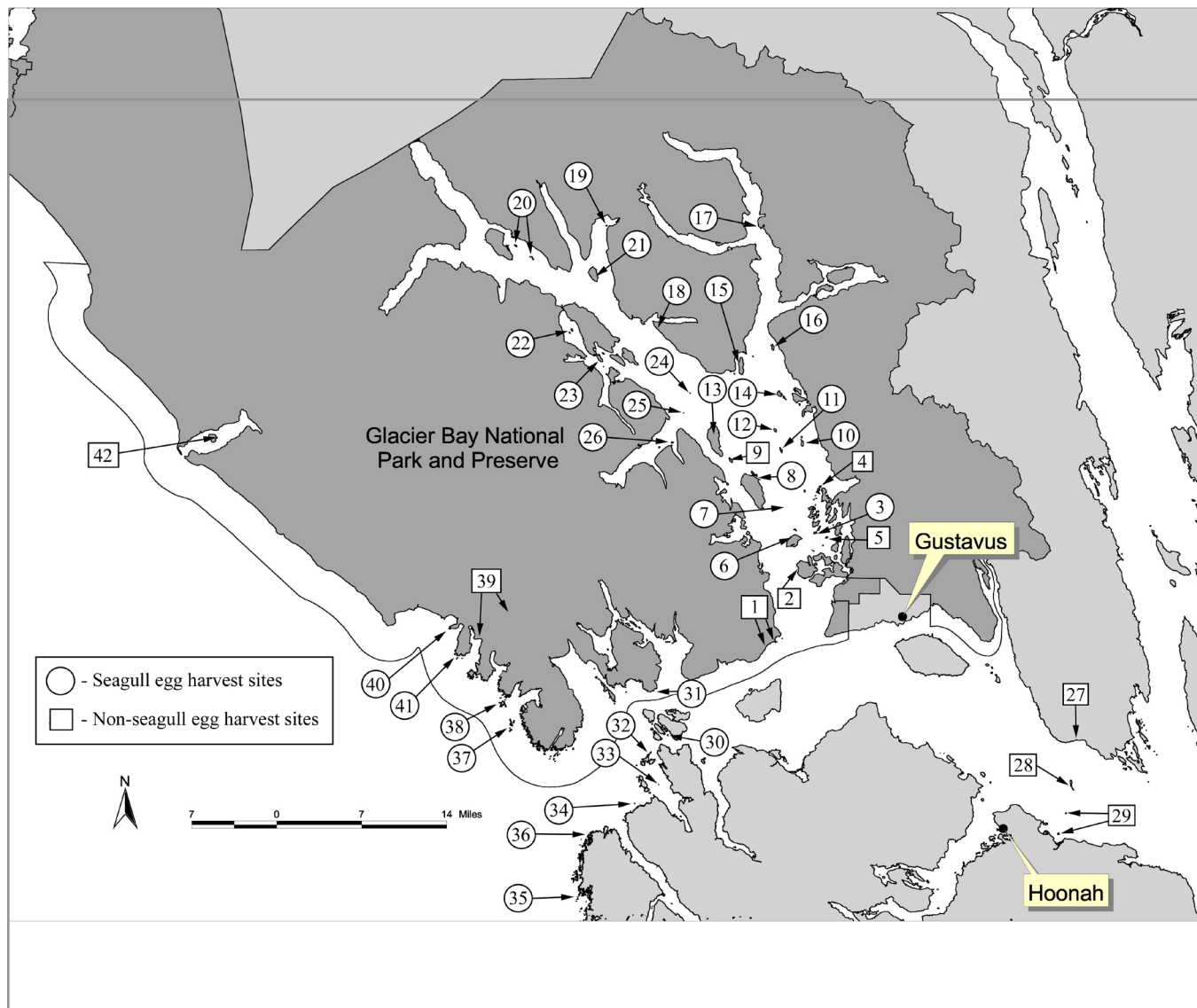
The above cautions notwithstanding, Zador (2001) concluded that limited egg collecting can occur at South Marble Island without negatively impacting the population dynamics of the gull colony. She recommends harvesting only once early in the season, taking all eggs from the nest to most likely initiate re-laying, and shifting harvest sites on a yearly basis.

Where and when gull eggs were collected

Clearly, earlier generations harvested gull eggs somewhat differently than the methods we describe. Practices and preferred harvesting sites varied through time according to changing environmental and social circumstances. One important change was the advent of the modern powerboat fleet in Hoonah dating from the 1920s, which meant that egg-harvesting parties no longer traveled by canoe to gull nesting

Photograph 12. In 1999 and 2000, Stephani Zador observed eagles roosting in the trees on South Marble Island and then swooping down in to the exposed gull colonies to prey on eggs.





1	Point Carolus
2	Young Island
3	Beardslee Islands
4	Flapjack Island
5	Goose Island (= Eider Island)
6	Strawberry Island
7	Boulder Island
8	Willoughby Island (formerly)
9	Francis Island
10	Leland Island
11	South Marble Island
12	North Marble Island (formerly)
13	Drake Island
14	Sturgess Island

15	Seabee Island (at Tlingit Point)
16	Garforth Island
17	Sealers Island
18	Tidal Inlet (islands? GD)
19	Triangle Island (Queen Inlet)
20	Russell Island rocks
21	Composite Island
22	Skidmore Bay Islands
23	Hugh Miller Inlet (islands)
24	Lone Island
25	Geikie Rock
26	Shag Cove Rock (Geikie Inlet)
27	Grouse Fort
28	Sister's Island

29	Pulizzi Island (Spasski Bay)
30	Inian Islands: Middle Passage Rock
31	Greentop (local name)
32	George Islands (outside Elfin Cove)
33	Table Rock (aka "Bird Rock")
34	Pt. Lucan-Column Pt., rock between
35	Surge Bay rocks
36	Yakobi Rock
37	Graves Rocks: Egg Island
38	Libby Island, rocks inside
39	Dixon Harbor: lake
40	Boussole Arch
41	Astrolabe Pt.
42	Lituya Bay: Centotaph Island

islands. Before mechanized boats were available, egg harvesting was likely less concentrated at regionally outstanding sites due to the greater effort involved in getting to and staying at these locations. Also, because Tlingit winter villages were more widely dispersed, the Huna would have probably exploited nearby sites more often.

Glacier Bay and its environs have many names in Tlingit—names with descriptive force that characterize its geomorphology (e.g., *Sit' Eeti Gheeyi* or “The Bay Taking the Place of the Glacier,” and *S'é Shuyee* or “End of the Glacial Silt”), its resources (e.g., *S'ix' Tlein* or “The Big Dish,” and *Tleikhw Aani* or “Berry Land”), and other outstanding features. Significantly, one name applied to the islands of Glacier Bay was *K'wat' Aani*, or “Egg Land,” a reference to the many bird eggs that dot this landscape each spring and a reflection of the Huna Tlingits' interest in them.

Most egg-harvesting sites identified by the Huna consultants, like those identified in earlier studies (Goldschmidt & Haas 1998, Schroeder & Kookesh 1990), lie within what is now Glacier Bay National Park and Preserve (GBNPP) (70%) and especially within Glacier Bay proper (62%). We identified 42 sites in traditional Huna territory where bird eggs were harvested by the Huna people, 33 of which lie within the boundaries of Glacier Bay National Park and Preserve. These sites are shown in **Map 4**. Of the 42 sites, 32 were used for gathering glaucous-winged gull eggs; of these, 25 are within GBNPP boundaries.

Because the Bay's glaciers have been in rapid retreat since ca. 1800, the locations of gull-nesting colonies, their topography, and overall abundance have been in flux throughout the historic period. As noted earlier, some colonies have disappeared recently including the North Marble Island colony (since ca. 1972). These recent changes in the availability of gull eggs are likely due to natural succession of the vegetation at these locations rather than to human disturbance. Although new gull colonies have been established, they are less accessible to Huna people (being far up Glacier Bay on inaccessible cliffs) than the defunct colony sites. Consequently, fewer nesting gull pairs are subject to regular Huna traditional harvest than in the past, despite the fact that gull populations throughout southeastern Alaska have increased, as indicated by Christmas count data (Audubon 1997).

Several biological and cultural factors come into play in deciding where to harvest eggs, most importantly site accessibility and productivity, egg accessibility and quality, attachment to the site, and spiritual significance. Dimensions of site accessibility include proximity to Hoonah and sites of associated activities (e.g., fishing), shelter for landing and anchorage, traditional and modern land rights, regulations, and so on. Although a site may have an abundance of eggs and even be accessible from the water, the eggs themselves can be dispersed,

We identified 42 sites in traditional Huna territory where bird eggs were harvested by the Huna people, 33 of which lie within the boundaries of Glacier Bay National Park and Preserve.

obscured by overgrowth, or beyond reach on cliffs or precipices. Competition from other predators, including bears, mink, otters, eagles, ravens, and crows, is also a consideration. According to a male Huna elder, the quality of eggs was believed to depend on the local habitat, e.g., gull eggs can be “polluted” by a “garbage” diet, since the gulls frequent harbors and garbage dumps. Glacier Bay eggs, as well as other foods harvested in Glacier Bay, were often esteemed as rich and pure by our Huna consultants.

Attachment to harvesting sites

The Huna people’s attachments to particular sites are built up in myriad ways—materially, socially, and spiritually. As de Laguna (1972:58) points out,

For individuals, of course, the world has special meanings, for there are places about which their grandparents and parents have told them, spots they have visited in their youth, or where they still go. None of these personal associations are completely private; all are intermeshed through anecdote or shared experiences. Not only is the world the scene of happenings long ago, yesterday, and tomorrow, but it has human significance for what it offers in food resources, scenery, easy routes for travel, or places of danger... All of these experiential channels serve to increase local knowledge and personal sentiments toward places, which in turn influence individual choices about where and how to collect foods. Thus an egg gatherer may prefer a certain island because that is where his family always collected, where his grandfather taught him how to land the boat, where to find the nests and how many eggs to take from them, and where the family enjoyed spring picnics each year. Conversely, he may look upon unknown landscapes with trepidation or even fear.

The importance of place and attachment to place among the Huna Tlingit have been explored in detail by Thornton (1995a, 1997a,b, 2000, 2002). This literature shows the power of place in individual and collective identity and how cultural constructions of place reflect human perceptions, interactions, and feelings in relation to specific landscapes. The importance of place in sociocultural life is also recognized by the National Park Service, under the rubric of cultural and ethnographic landscapes and Traditional Cultural Properties (see “Gathering Sites as Cultural Landscapes and Traditional Cultural Properties” in the Conclusions section).

Spiritual significance of sites

For many Huna, there is a spiritual component to egg-gathering trips. Reflecting strong attachment to their “sacred ancestral homeland,” most Huna consultants emphasized that going to Glacier Bay was more even than a treasured social gathering. The act of egg gathering and consumption connects them symbolically to ancestors who sustained their bodies in the same way with identical food from this sacred place.-

... I felt everything...the spirits were so strong. I was just so alive. I just felt it through my whole body. My dad was born here. My dad told me stories. I couldn't tell anyone how I felt. It was just like a big shining light. (Huna Tlingit female in her 50s).

Several biological and cultural factors come into play in deciding where to harvest eggs, most importantly site accessibility and productivity, egg accessibility and quality, attachment to the site, and spiritual significance.

We were taught [that] the place where we get our food was always sacred, and the food we ate, everything had spirit in it that we respected... Everything we got from up there was sacred because when people were living up there... it was just like the Garden of Eden... Everything they touch[ed] was beautiful. People were happy. That was the second thing to the Garden of Eden. (female Huna elder)

...the difference between an egg inside Glacier Bay and an egg outside Glacier Bay is [that Glacier Bay is] our traditional homeland...where our heart and soul is...what ties us to our land. Our food that comes out of there is directly responsible for our strength, our knowledge, our inner peace, compared to [food] from outside... (female Huna tribal administrator, in her 50s).

South Marble Island

Historically, traditional Huna Tlingit gull egg harvests were necessarily opportunistic with the most productive harvest locations changing in accordance with the highly dynamic environment. However, during much of the time period reported on by our consultants, the Marble Islands—and especially South Marble Island—were very popular for family outings because of their early, accessible, and abundant eggs. Just 80 km by boat from Hoonah, South Marble Island is sheltered from the strong currents and heavy swells that make access difficult and dangerous to colonies in Icy Strait/Cross Sound, (e.g., Middle Pass Rock and Table Rock in the Inian Islands) and on the outer coast, as at Surge Bay Rocks, Yakobi Rock, the Graves Rocks area/Egg Island, Libby Island, and Boussole Arch. All Huna consultants remembered harvesting eggs on South Marble Island or—if they were too young to have participated—hearing stories about those harvests. Fewer than half of our consultants mentioned any other site. The Huna Tlingit's access to the gull colony on South Marble Island was by way of shallow gullies leading up from the gentle southern shoreline (**Photograph 13**). The northern shoreline has recently become a Stellar sea lion haul-out, raising concerns about future access to the colony. The eastern shore is a near-vertical cliff.

Earlier writers have noted the existence of gull colonies on the Marble Islands. Trager noted in 1939 that, “[g]ulls nest in very large numbers each spring in the southern part of the area, particularly on North and South Marble islands and the small islands of Geikie Inlet.” Been also noted, visiting North and South Marble Islands in August 1940, that each “has been a nesting place for seagulls for many years. Gaucase wing gulls [sic.] predominated to inclusion [sic.] of nearly every other gull except a few haring [sic.]” (Been n.d. [1940]:38–39).

Jewett (1942) estimated 100 pairs each on North and South Marble Islands in July 1941, and Patton (1974:18) estimated 500 nesting pairs on North Marble Island in both 1972 and 1973. Although Patten did not estimate the number of nesting pairs on South Marble Island, he and other observers have suggested

All Huna consultants remembered harvesting eggs on South Marble Island or—if they were too young to have participated—hearing stories about those harvests. Fewer than half of our consultants mentioned any other site.

Photograph 13. Boat access points, South Marble Island, c. 2002.



Illustrating the dynamic environment of Glacier Bay, North Marble Island no longer supports significant numbers of nesting glaucous-winged gulls—presumably due to ecological succession.

that the colonies on the two islands were similar in size, as are the islands themselves. Together, the Marble Island colonies were “by far the largest in Glacier Bay” (Patten 1974). Paige (1975) noted that North and South Marble Islands supported by far the largest gull colonies in Glacier Bay in 1975—a year in which nesting failed completely. He estimated 1000 nests on North and South Marble Islands combined (Zador & Piatt 1999:20).

Illustrating the dynamic environment of Glacier Bay, North Marble Island no longer supports significant numbers of nesting glaucous-winged gulls—presumably due to ecological succession. In May 1999, Zador and Piatt (1999:20) counted only 25 birds on the grassy slope of North Marble Island’s southwest corner. In 1999 and 2000, Zador (2001:5) estimated about 700 glaucous-winged gulls nesting on most of the unforested area of South Marble Island.

Timing of gull egg harvests

The “moon” or month named “Going to Get Eggs Moon” in Huna Tlingit corresponds to the period mid-May through early June.

You’d see all the seagulls would be gone from this area [Hoonah]. And one of our uncle’s boats would take off. Would take the whole family up to Glacier Bay to gather eggs... (male Huna elder).

According to one Huna consultant, the quality of the gulls’ voices changed as the nesting season approached. Others noted that when Indian celery reached a certain height at Hoonah, it was time to head for Glacier Bay to harvest eggs. This typically coincided with the onset of warmer weather shortly after mid-May. Historically, sealing and fishing parties also returned from Glacier Bay at this time with reports on the state of the nesting colonies.

Because birds’ eggs were among the first fruits of the year and thus eagerly anticipated and craved, sites that yielded eggs early were favored. Sites “on the inside” (i.e., in Glacier Bay) consistently yielded eggs one to two weeks earlier than those on the outer coast. According to a male Huna elder, the Marble Islands were said to be the earliest due to the “incubating” effects of the heat-retaining rock.

Egg-collection strategies and conservation considerations

The themes recurring throughout our Huna interviews are that gull eggs should not be overharvested, that people should take only what they need, that eggs are not to be wasted, and that the gulls and their eggs are to be respected. Nearly all consultants affirmed an egg-harvesting strategy that allowed a substantial annual egg harvest while attempting to minimize the impact of that harvest on gull nesting success. Most consultants stressed a personal preference for fresh eggs, and the strategies cited to collect them (including timing of harvest) were designed, in part, to increase the chances that harvested eggs would be fresh. Some basic knowledge of gull egg-laying biology is

reflected in almost all gull egg-harvest strategies reported by Huna consultants. Yet, not everyone used the same strategy in harvesting gull eggs. Table 4 presents frequencies for the various egg-gathering strategies reported by Huna consultants.

Harvesting from nests with one or two eggs

Of the 39 Huna consultants responding, most (64%) reported taking eggs only from nests containing one or two eggs. (Two of these consultants also reported that the proper strategy is to always leave one egg, and two others reported that only one egg should be taken from 2-egg nests.) In fact, two prominent Huna leaders issued the following statement to the research team:

Table 4 Distribution of egg-gathering strategies reported by Huna Tlingit consultants.

STRATEGY	N	%
Nests with 1 egg		
Take <i>only</i> from 1-egg nests	5	12.8
Nests with 1-2 eggs		
Take all eggs from 1- or 2-egg nests	16 ^a	40.9
Take 1 egg from 1- or 2-egg nests	2	5.1
Take 1 egg <i>only</i> from 2-egg nests	2	5.1
Nests with 1-3 eggs		
Take all eggs from 1- to 3-egg nests	2	5.1
Take 1 egg from 1- to 3-egg nests	2 ^a	5.1
Take all eggs from 1- or 2-egg nests; take 2 eggs from 3-egg nests	3 ^a	7.7
Take eggs from 2- or 3-egg nests, but <i>always</i> leave 1 egg	1	2.6
Take 2 eggs <i>only</i> from 3-egg nests	1 ^a	2.6
Nests with more than 3 eggs		
Take all eggs from 1- to 4-egg nests	1	2.6
Take eggs from 2- to 4-egg nests, but <i>always</i> leave 1 egg	1	2.6
Take two eggs <i>only</i> from 4- or 5-egg nests	1	2.6
Leave 1 egg	1	2.6
Throw out other eggs / mark nests / return and take all eggs	1	2.6
Total	39	100.0

- One respondent indicated that later in the season all eggs were float-tested (i.e., for developing chick).
- Respondent indicated that eggs from 2- or 3-egg nests were float-tested.
- Respondent indicated that eggs from 3-egg nests were float-tested.
- Respondent indicated that all eggs were float-tested.

There are a significant number of people that know the right way to collect eggs. That is one or two from a nest. Seldom three are taken and then only if people want to eat the developing chick. There are enough able tribal members that can hand down the knowledge to the younger people.

Because three eggs is the normal full clutch for glaucous-winged gulls, especially early in the season, nests with one or two eggs are more likely to be incomplete and the eggs more likely to be fresh (eggs are normally laid one every two days). Given the limited number of developing follicles present in the female at the time of the egg harvest, if one or both recently laid eggs were removed, the female would likely return and continue laying more eggs until the clutch is complete. According to two Huna consultants,

We only picked one or two eggs. If there were three eggs in the nest, we were told to leave it alone because there was usually birds in there.

And we didn't pick any eggs off the nest that had already three eggs. If they had three eggs in there, then they had an embryo... If there was one egg, two eggs, you could pick them, but if there were three eggs, then we stopped.

Harvesting from nests with up to three or more eggs

Harvesting from nests with three or more eggs was reported by 31% of our consultants and confirmed by Traeger (1939). Given the rarity of four-egg clutches, reports of harvesting from nests containing four eggs probably miscalculate the typical size of completed clutches and thus represent “errors” (cf. Patten 1974, Reid 1987). Accordingly, Zador (2001:24) reports only one clutch with four eggs out of a total of 291 nests in her control group in 1999 and 2000. A possible hypothesis is that sustainable harvests would be problematic if all eggs harvested were taken from three-egg nests on a wide scale and if practiced at times other than early in the laying season. Interestingly, all but three of our consultants who reported harvesting from clutches of three or four eggs followed a strategy of leaving one or more eggs in the nest.

There are very limited scientific data to assist in evaluating the impact of harvesting from three-egg nests on fledging and ultimately on gull populations. Zador (2001:15) reports that the probability of gull re-nesting among predated gull egg nests increased the earlier the predation occurred. As noted previously, she experimentally removed clutches of three eggs on the day the third egg was laid from nests on South Marble Island in 1999 and 2000 (Zador 2001:17–18) and observes:

I removed the clutch on the day the third egg was laid in 17 nests in 1999 and 24 nests in 2000... Most (93%) gulls from these laid replacement clutches of 1 to 3 eggs... Pairs replaced their clutches with 3-egg clutches in 82% of the cases. In 2000, 2 nests were depredated within 2 days of when the first and second eggs were laid, so I do not know what the final clutch size would have been if predation had not occurred. The proportion of replacement clutches that contained 3 eggs did not differ from the proportion of unmanipulated clutches that contained 3 eggs... This pattern remained the same when depredated nests were excluded from the analysis. Pairs with their clutches removed laid on average 2.71 (in 1999) and 2.01 (in 2000) more eggs than those

in the unmanipulated group, but there was no difference in the number of eggs that hatched in either year...

Unfortunately, her data do not allow conclusions on fledging, winter survival, and future reproductive success.

Leaving one or more eggs in the nest

Most Huna consultants who reported a harvest strategy for nests containing three or more eggs also described strategies that included leaving an egg or eggs in the nest. In total, 14 consultants (36%) described such tactics. One person described a strategy of leaving eggs in the nests based on the time of egg collection during the nesting season:

In the early part [of the season] you...take all of them. At a later date you start becoming selective even though it's pretty hard to tell which one is which... we used to take two and leave one... And then you start taking only one.

From a sustainability perspective, what are the potential contributions and detractors of leaving eggs in nests? Stephani Zador (pers. comm. Nov. 5, 2001), was asked to discuss this matter relative to fledging success, and her response is in the box to the right.

A third—and mostly rejected—strategy

In addition to the previous two approaches, one Huna couple reported that an older relative told them of a strategy in which all eggs in a nest were destroyed so that the gulls would return to lay fresh eggs. Nests where eggs were destroyed were then marked, and the gatherers would return to those nests to harvest the re-layed eggs.

They'd go find the eggs if they wanted fresh eggs, and then they'd mark the nests and throw the eggs out. And the seagull would come in and lay fresh eggs.

Trager (1939:4) also reports this strategy:

... Two methods are used in taking the eggs. One is to rob only nests containing three or less eggs. The other method is more destructive. Upon landing on the island, all eggs present in the nests are destroyed. Then three or four days later, all nests are robbed of all eggs they contain, thus eliminating the possibility of taking partially hatched eggs.

If practiced rarely, such a strategy might work from an egg-collecting perspective. Although glaucous-winged gulls lay a single brood, they may re-nest if their clutches are destroyed during the incubation period (Bent 1963; Zador 2001). Nonetheless, most Huna consultants described the “proper” strategy as one that leaves alone nests that on average are complete. Throwing out eggs to induce re-laying has been described as “wasteful” or “destructive,” and is seen as such by many Huna Tlingit who explicitly reject it. Destroying

...I did not do any experimentation beyond hatching success [in Glacier Bay], so any inferences I can make about fledging success [must be] based from the literature. We know that in most cases the gulls will not continue to lay eggs when they have already been incubating one or more. (The process of incubation coincides with the regression of egg-production capabilities). So, if one egg is left, they will be able to fledge one chick at the most (assuming all other conditions are favorable). If the gulls are induced to re-lay, they may be able to incubate and fledge an entire clutch of three (assuming all other conditions are favorable). We can see in the literature that, for example, later-laid eggs are less likely to give rise to fledged chicks, but the exact probabilities for these gulls are as yet untested. Given that the gulls can fledge up to three chicks in a good year, if many pairs were left with only one egg to incubate and brood to fledging, it is logical that overall fledging success would be reduced. In fact, fledging success would be limited to one chick/pair, even in the best of conditions.

In glaucous-winged gulls, incubation starts with laying of the second egg (Shultz 1951, James-Veitch & Booth 1954) but full incubation not until clutch is complete (Vermeer 1963, Verbeek 1988). Once incubation begins, reforming eggs after complete egg loss takes about 12 days (my data). As long as eggs are taken before the clutch is complete, the birds should physiologically be able to continue to lay eggs. However, some birds complete a clutch at one or two eggs. If a gull has laid three eggs, the clutch is (usually) complete. In the situation...[where] there were three eggs and two were taken within hours after the third was laid, the female would generally need to resume follicle growth to form the replacement egg(s). But it will not do so if meanwhile it is incubating the egg left in the nest.

Although I did not test this experimentally, I do believe that taking of a partial clutch before clutch completion/ incubation would induce laying more eggs until the final clutch size is reached—in other words, taking one egg from two in a nest where the female was preparing to lay a third. However, if the female did not have a third follicle on the way, then she would not continue to lay. In some of my nests where I removed one egg... 5% did not continue to re-lay. I assumed that these eggs were from what would have been one-egg clutches, similar to the 4% of the unmanipulated clutches that were composed of one egg. So I would predict that some proportion of gulls that lost a single egg from a two-egg clutch would not lay a third. Although much of this is physiologically constrained, there are other factors that influence when/how many eggs are laid.

eggs and returning to the nests requires more human effort, i.e., first removing the eggs (and probably also marking those nests) and then returning several days later in hopes of finding fresh eggs. Also, given that Zador (2001:31) observed 38–57% of female gulls changing nests when three eggs were removed, eggs from considerably more nests than were intended for harvest would have to be raided to reach target harvests.

I've never heard of Huna Tlingit people deliberately destroying all the eggs. To me it has never been a traditional method to destroy all the eggs. (male Huna elder)

I've never heard of Huna Tlingit people deliberately destroying all the eggs. To me it has never been a traditional method to destroy all the eggs.

male Huna elder

We believe this strategy was rarely practiced. It was certainly not part of the familial egg-harvesting tradition valued by the vast majority of Huna respondents in our study. However, these differences in opinion within our sample demonstrate that a highly traditional culture—while characterized by widely shared understandings—is also an evolving system of sometimes competing beliefs and practices.

The “water test”

If there were questions about whether eggs might contain embryos, they were “float tested.” If the egg sank, it was “fresh”; if it floated, it was “too far gone.” This practice was described over 60 years ago by a Park Service biologist: “Some of the Indians are less destructive in collecting eggs; their practice is for each member to carry a small pail of seawater and test all eggs by placing them in this water. Those that float are replaced in the nest, and those that sink are collected” (Trager 1939:4).

A male Huna elder explained this process in more detail:

...by the time it's June, the climate is so warm, in a day or two the eggs that has been laid two or three days ago, they already had chicks in there. So... our people used to carry a bucket of warm water, and they would take one egg at a time from the nest if there's two or three, and they would put it in warm water. The temperature of the warm water should be [only] warm enough so you're not cooking the eggs... And when it floated, it's telling you one thing—that there's a chick in there. So we put it back to let it hatch. Pick another one... We don't want to kill the whole population of seagulls off. (authors' emphasis)

Perceived impacts of Huna Marble Island harvests

Some observers have suggested that Huna Tlingit egg harvests may have been responsible for observed or imputed nesting failures of glaucous-winged gulls in the Park. The best known and most influential of these claims is that incorporated in Lowell Sumner's “*Special Report to the National Park Service on the Hunting Rights of the Hoonah Natives in Glacier Bay National Monument*” (1947). The report was solicited by the National Park Service in response to pressure from the Bureau of Indian Affairs (BIA) to permit seal hunting in Glacier Bay.

Sumner concluded that egg harvesting “would result in severe depletion” of the gull population if allowed to continue. He recommended to the Park Superintendent that egg harvesting be excluded from the “special privileges” of “the Hoonah natives” (Sumner 1947:10). Sumner’s recommendation was based on an inference that the nesting colony failure must have been caused by Native harvests:

[O]n June 25, 1947, the seabird nesting colony on North Marble Island was inspected by the National Park Service party... According to normal expectation, nesting activities should have been well under way at this date, with hundreds of young gulls in evidence, or at least hundreds of nests with incubation well underway. Instead, great crowds of gulls stood at empty nests, displaying the listlessness that characteristically settles upon a bird colony a few days after it has been robbed. There were no young gulls whatever, and of nests that contained eggs, only one had the full complement of three... It is recognized that the Hoonah natives used to raid the bird colonies of Glacier Bay during primitive times [sic.]. However, Hoonah has become an incorporated town with daily radio communication...and all the home conveniences of the machine age that the mail-order houses can furnish. Use of seabird eggs by such a large community can only result in eventual severe depletion... The Director’s authorization of January 7, 1947, listing the special privileges of the Hoonah natives, does not include the gathering of seabird eggs. It is believed that in view of present and future use of Glacier Bay National Monument, this omission is completely justified.

Sumner’s inference that the colony failure must have been due to native harvesting is highly speculative. Catton (1995:124-128) has criticized Sumner’s report as biased and inadequately documented, concluding that:

Sumner’s cursory investigation and subsequent report of August 5, 1947 reflected the NPS’ strong predisposition to ban Native hunting in the Monument. Sumner’s few days in Glacier Bay in late June allowed only a brief appraisal of the effects of Native hunting and egg collection on the animal populations in the Monument, much less a reliable assessment of population sizes and trends of the various species that most concerned the NPS... His report contained a scant seven pages of text. Nevertheless, it was a strongly worded condemnation of the present policy of allowing the people of Hoonah certain privileges [in particular, egg collecting] in the Monument. Tomlinson gave Sumner’s report his full support.

We cannot rule out, however, that Sumner’s visit to the North Marble Island colony happened to occur shortly after an extensive harvest by Huna people, particularly if the alternative “destructive” strategy of destroying all eggs in the nests were carried out. If indeed “great crowds of gulls stood at empty nests...” on June 25, 1947, this would argue against a nesting failure caused by a drastic crash in food supplies, since it is unlikely that many gulls would have remained at the colony (Stephani Zador, pers. comm., March 21, 2001). However, given evidence that colonies will re-nest after such a disturbance in about 12

days, it is quite possible that had Sumner returned to the colony two weeks later, he would have found many nests with eggs (Shugart & Scharf 1976:473; Stephani Zador, pers. comm., Nov. 20, 2001).

A similar reproductive failure of glaucous-winged gulls was documented in 1975 (Paige 1975) after traditional egg harvests were prohibited. However, the 1975 failure was evident throughout Glacier Bay and not restricted to a single gull colony.

Self-limiting factors of Huna gull-egg gathering

Given that gull eggs are a finite resource and the extent to which they were seemingly valued among the Huna community, a logical question is: Were restrictions placed on the number of people who could harvest eggs or the number of people gathering eggs at one time at a single egg-gathering location? According to our data, apparently no such limits were employed nor even considered.

How is it possible, then—given that the local community did not explicitly restrict the number of people harvesting gull eggs by normative regulation—that serial Huna Tlingit harvests were limited, particularly in the era of motorized access? The authors hypothesize that five factors functioned to limit the number of gull eggs taken during traditional Huna Tlingit egg harvests.

First, Informal communication within the Hoonah community would likely have affected the time and place of gull egg harvests. If a party planning an egg-harvesting trip knew that another party had just returned from a specific location with many eggs and that the site had been visited several times previously, they would alter their harvest plans. Given the strong interest in gull eggs, information on the prevalence of eggs with developed embryos or the number of eggs in nests at a particular colony would also have circulated throughout the community. Conservation aside, such communication would have been used to maximize the probability of success in harvesting a good supply of fresh eggs. Also, because eggs were shared widely, some people with access might have decided not to go at all if they were given enough eggs to meet their needs and/or the indications were that gathering conditions were marginal.

Second, Huna people were knowledgeable about key aspects of gull reproductive biology, particularly the limited time-frame during the egg-laying cycle when gulls were more likely to re-lay if eggs were taken from their nests and the number of times a gull was likely to re-lay.

My grandfather used to tell me...if you take the [seagull egg from her when she first lays the eggs] she won't miss it. She'll come back and...she'll replace it...But you have to get it at the right time. If you wait too long, then the ability changes...to replace another...egg. (male Huna elder)

Third, because fresh eggs were nearly always preferred over partially developed eggs, most Huna people sought to maximize the probability of gathering a good supply of fresh eggs. This meant that the harvest

was generally timed to coincide with the early, most productive phase in the egg-laying cycle. No consultant, whether or not they liked partially developed eggs, described a harvest strategy that purposely targeted partially developed eggs in quantity.

Fourth, Huna people were acutely aware that their harvest activities, if not conducted properly and with “respect,” could be destructive. Many people considered the proper harvest strategy to be an expression of respect for the gulls.

If we respect it, we'll always have an abundance of food. (Huna male leader, in his 50s).

Fifth, although egg gathering in Glacier Bay was deemed highly important for family interaction, it has never been a major food-gathering activity in terms of the time and energy expended relative to the amount of food acquired. Thus, the authors believe that during most of this century—especially after access was motorized and non-Native foods were commonly available through the cash economy—Huna egg gathering was valued more for its intangible benefits and rewards than its necessity as an individual or community food supply. Given this perspective, egg gatherers would have been opportunistic in taking gull eggs in Glacier Bay within the larger context of other simultaneous subsistence and commercial resource harvests. For many families with the equipment and finances to travel to Glacier Bay, egg harvesting may have been unfeasible some years because of the constraints of other harvesting activities. This would have restricted the pool of people able to make the trip during the short period when conditions were optimal for gathering quantities of fresh eggs.

Given the above circumstances and conditions, the authors infer that the number of Huna people actually going to Glacier Bay for egg gathering in any given year was limited. Not all families gathered eggs every year and our Huna interviews support the notion that some families, for various reasons, were much more involved in egg gathering than others.

Our study data provide no reason to conclude that the presence of more than one party—on South Marble Island, for example—in and of itself would have ruined the trip for the participants. Apparently, the primary motivations for these trips were the interactions among family members and friends—within a cultural context that goes to the core of Huna Tlingit identity. As long as there were plenty of eggs to go around, another party or two might have enhanced the experience for some people. Alternatively, if the area were overcrowded, people simply would have gone elsewhere.

Estimating Huna egg harvests before National Park prohibitions

We can neither determine exactly how many families harvested gull eggs in Glacier Bay each year nor how many eggs they took. For about 50 years, an official presence has discouraged use of the Park for most subsistence purposes. Many people's last remembered egg-gathering trip

My grandfather used to tell me...if you take the [seagull egg from her when she first lays the eggs] she won't miss it. She'll come back and...she'll replace it... But you have to get it at the right time. If you wait too long, then the ability changes...to replace another... egg.

male Huna elder

to these islands was before or during the early 1960s (Table 5). Thus, Huna consultants’ recollections provide only rough approximations of the quantities of eggs harvested.

At the time of our interviewing, people in Hoonah were understandably reluctant to talk about an activity defined as illegal by the U.S. Government for use in a study funded by an agency responsible for enforcing applicable laws (NPS). We thus avoided asking about illegal harvesting. Consequently, we cannot estimate consumption levels of gull eggs in Hoonah at the time of our interviews from consultants’ direct responses. We believe, however, that gull-egg consumption in Hoonah was then quite limited—with apparently only small quantities of illegal eggs occasionally coming into the community.

An alternative way to estimate Huna egg harvests before more active law enforcement—and after Huna people began to acquire larger and faster boats—is to calculate the quantities of eggs available for harvest given the cultural context of Huna Tlingit egg gathering, including strategies for taking them and available technology. Such estimates are limited by the fact that the glaucous-winged gull nesting populations have not been systematically monitored at any site in the region, much less at all sites. Other than competition from other predators, the number of eggs that may have been harvested is a function of 1) the number of active nests within a given radius of Hoonah at that time (i.e., the 1950s), 2) the number of “surplus” eggs that a female gull might produce given what is known of gull breeding biology, and 3) the efficiency of Huna Tlingit gull egg harvests.

For the number of nests during this period, we have only Patten’s (1974) rough estimate from 1975 of 2000 breeding birds (1000 nesting pairs) for the North and South Marble Island breeding colonies (reduced to about 350 pairs in 2000 on South Marble) and a count for 1982 of 1494 nesting birds (747 nesting pairs) tabulated at nine outer-coastal colonies by SOWLS et al. (1982). However, we believe that these outer-coastal colonies were likely harvested only incidentally while pursuing other resources. The colony on Middle Pass Rock in Icy Strait is likely the only colony outside of Glacier Bay that would have contributed significantly to this harvest.

For the number of surplus eggs, two estimates apply. Nager et al. (2000:1343) report a mean number of 8.59 eggs laid per female, based

Table 5. Last reported Huna Tlingit egg harvests since before the 1950s.

DATE	BEFORE 1950s	1950s	1960s	1970s	MORE RECENTLY	NEVER	TOTAL RESPONSES WITH RELEVANT INFORMATION
NUMBER OF CONSULTANTS	5	4	7	3	1	3	23
% OF TOTAL RESPONSES	22	17	31	13	4	13	100

on experimental manipulation of nesting lesser black-backed gulls. Zador (2001:23) reports considerably lower averages per female of 5.75 eggs (in 1999) and 5.78 eggs (in 2000) for the South Marble Island glaucous-winged gull colony in Glacier Bay. Subtracting three eggs from these averages to allow for an eventual full clutch of three eggs, we can estimate the theoretical “surplus” egg productivity—i.e., the number of eggs that might have been taken from each nest while leaving a full clutch that could then be incubated, hatched, and fledged—at 2.8 to 5.6 eggs per nest. This “surplus” production is likely somewhat more than a “sustainable” harvest, since the stress to the gulls of replacing lost eggs and the delays incurred in completing the nesting cycle would reduce fledging success rates.

We have no quantitative data with which to estimate the third factor, the efficiency of Huna Tlingit egg harvests (i.e., the fraction of “surplus” eggs that we might reasonably expect the Huna to have harvested each year). Certainly, the Huna could not have harvested 100% of the “surplus” eggs, given that some fraction of the active nests would have been located on inaccessible terrain and that some fraction of nests and/or eggs would have escaped notice. During any given visit, some nests would either have been empty or would have complete clutches, and thus would have been passed over. The variation in reported harvest strategies would also have tended to reduce the overall efficiency of the harvest. Finally, competition from other predators would have reduced the number available to Huna egg collectors.

On the other hand, Huna consultants report that harvests were organized to coincide with the most productive period of the nesting cycle, taking advantage of the tightly synchronized laying schedule in the colony. The Huna also communicated with one another about the condition of the colony and the success of recent harvest efforts, which could have substantially enhanced overall harvest efficiency. For the sake of illustration, the possible number of eggs sustainably harvested can be calculated at several levels of efficiency, e.g., 30%, 50%, and 70%. These limits suggest a range of estimated annual harvests of between 840 and 3920 eggs, as shown in Table 6 below.

Catton (1997:107), drawing on annual statistical reports for 1943 and 1945 by the Bureau of Indian Affairs, states that in 1943 “800 dozen” (or 9600) gull eggs were harvested by Huna Tlingits from throughout their traditional use area. To support an annual harvest of 9600 eggs, there must have been a substantially larger nesting gull population in lower Glacier Bay than at present and there are observations in the historic record to support this. As noted earlier, Bailey (1927) observed that glaucous-winged gulls were especially abundant on Willoughby Island and that they nested by the thousands on the brush-covered slopes of the Beardslee Islands, although today both sites no longer support sizeable gull colonies.

Federal regulation of gull-egg harvests

Table 6. Estimates of Marble Island egg harvests before Park Service enforcement, based on three hypothetical efficiency rates (ER).

EGGS / NEST	"SURPLUS" PER NEST [†]	TOTAL SURPLUS / 1000 NESTS ^{**}	30%ER	50%ER	70%ER
8.6 [‡]	3.6	3600	1080	1800	2520
5.8 [‡]	2.8	2800	840	1400	1960

† Nager et al. (2000:1343)

‡ Zador (2001)

* Assuming a 3-egg completed clutch.

** As reported for the Marble Island colonies by Patten (1975).

At the beginning of the 20th century, when it was obvious that many migratory North American bird populations were in serious decline, widespread interest in their conservation began. According to Wagner and Thompson (1993), the loss of opportunities to hunt waterfowl was a concern of the organized sport hunting fraternity. Concerns were also raised over the potential effects on agriculture as insectivorous bird populations declined. Migratory routes had been identified in the 1890s (by banding) and the necessity for effective regulation of bird harvests on an international scale became clear.

Migratory Bird Treaty Act

In 1914, the U.S. presented a draft treaty to the Canadian government. After being signed by American and British representatives in 1916, the Migratory Birds Convention Act was passed by Parliament in 1917. Subsequently, the U.S. Congress passed the Migratory Bird Treaty Act (MBTA) in 1918. Eventually, Mexico signed a similar treaty in 1936 and conventions were also signed with Japan in 1972 and Russia in 1976. The MBTA is the domestic law that implements U.S. commitment to the international conventions.

Birds are classified in the MBTA as migratory game, migratory non-game, and migratory insectivorous birds. The act governs the taking, killing, possessing, transporting, and importing of migratory birds, their eggs, parts, and nests. Wagner and Thompson (1993) state:

Hunting of non-game and insectivorous birds was prohibited. A closed season on hunting of game birds was established from March 10 to September 1, with a maximum length of a hunting season at any location set at three and one-half months... Sale of any birds, eggs and nests was prohibited.

Despite limited exceptions for subsistence uses, until recently the MBTA generally outlawed the taking of migratory birds and their eggs during the spring and summer, including customary and traditional harvests in areas where people depended upon them. Paradoxically, customary and traditional harvests by indigenous people are guaranteed by the Canadian constitution, and both are acknowledged and protected by U.S. policy. Since the mid-1980s, the U.S. Fish & Wildlife Service (USFWS) has used “discretion” in enforcing laws establishing closed seasons that impact customary and traditional harvests, provided that such harvests did not adversely affect species’ populations and birds were not wasted (Tollefson 1999). Not surprisingly, traditional harvest by Northern indigenous groups in the spring and summer continued throughout the tenure of MBTA, especially in rural and remote areas.

Negotiations to change the MBTA began in the 1970s but conventions were not signed until December of 1995. The Senate gave its consent to the protocol for amendment in October of 1997. On October 7, 1999 the USFWS announced that the U.S. and Canada had formally agreed to a protocol amending the 1916 Migratory Bird Treaty Act. This agreement allows both countries to recognize and cooperatively manage subsistence uses of migratory birds and their eggs for “their own nutritional and other essential needs,” including such harvests in the spring and summer. Given that these harvests have been ongoing, the 1999 MBTA amendments function mainly to legitimize them. They also implicitly acknowledge that such activities are not inherently ecologically unsound. The protocol establishes eligibility for the “indigenous inhabitants of Alaska” in specified areas (Tollefson 1999).

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Tollefson 1999

Federal enforcement of harvesting prohibitions in Glacier Bay

The history of Huna gull-egg harvesting privileges and the federal enforcement of egg-gathering prohibitions within Glacier Bay are far from clear. In a December 1939 letter to Frank Been, NPS Director Cammerer states: “It is our intention to permit the Indians to take hair seals and to collect gull eggs and berries as they have done in the past, until a definite wildlife policy can be determined” (Norris 2002:39). The authors note that in 1947 Lowell Sumner recommended an end to gull-egg gathering in Glacier Bay as a “special privilege.” This language implies that Sumner believed the Huna people had the same type of privilege to collect gull eggs that they had for seal hunting and other food-harvesting activities. He also apparently believed this privilege was recognized by his intended readers. However, the NPS agreement with the Bureau of Indian Affairs in December 1946 that sets forth Huna privileges in Glacier Bay does not mention egg collecting. It does refer to berry picking and is primarily about seal hunting.

According to Wayne Howell (pers. comm., August 20, 1999), an unnamed, long-time employee of the park (now retired) says that Superintendent Henry Schmidt advised Huna people in 1953 or 1954 that egging was illegal and to stop. (There is, however, no formal record of Schmidt’s statement and the retired employee declines to be taped.) In addition, according to Howell, a park ranger stationed at Glacier Bay from 1953 to 1955 recalls seeing people gathering eggs on South Marble Island but did nothing to stop them because there were many poaching violations and he did not regard this as a serious issue. NPS ranger reports of the 1960s contain no record of citations or contacts associated with egg harvesting. Superintendent Howe, according to Howell, says that when he transferred to the Monument in 1966 he had no knowledge of egg harvesting and was unaware that it was an issue. Regarding the timing of more intensive enforcement to prevent gull egg gathering, Howell says:

The best we [GBNPP] can say is that people were informed not to egg harvest in 1953 or 1954 and enforcement must have occurred sometime after that, so that by 1966 it [egg gathering] was not occurring overtly (although we know that people continued to collect when they could be sure nobody was watching).

Summary of the Huna Tlingit’s responses to the prohibition on egg collecting

The authors emphasize that most Huna people consider gull-egg collecting integral to the larger issue of their displacement from Glacier Bay, depriving them of a much broader range of occupancy and subsistence uses. Our Huna consultants were universally critical of laws and regulations that exclude them from Glacier Bay National Park and Preserve (GBNPP) for the purposes of taking important traditional foods, including gull eggs. This does not mean, however, that people said they are presently materially impacted by the closure of the park to

egg gathering. Gull eggs were widely considered a delicacy, and today Glacier Bay is the only nearby place with safe access where quantities of gull eggs can be taken by extended families. The importance of the loss of legal access to GBNPP for egg collecting is tied to the spiritual importance of Glacier Bay as the Huna ancestral homeland, the spiritual nature of food, its relationship to personal and group identity, and the salience of nostalgic memories held by people who gathered eggs as children.

In attempting to understand Huna reactions to federal restrictions on egg gathering in GBNPP, it is important to note that the Huna Tlingit see themselves as intrinsic to the natural ecological system—not separate from it as is characteristic of Judeo-Christian philosophy and much contemporary secular wilderness advocacy. Given that the Huna consider themselves the historical caretakers of this pristine natural area that is impressive enough to outsiders to be deemed one of the preeminent wilderness parks in the United States, they find it paradoxical that they have been prohibited from many traditional subsistence activities.

Huna reactions to questions about the impact of NPS restrictions on access to Glacier Bay gull-egg harvests are categorized below to represent the essence and range of Huna perspectives. Quotations illustrating various perspectives are listed within each category, although some may apply to multiple categories of reactions.

1. *Displacement from Glacier Bay for the purpose of egg collecting has denied a generation of Huna Tlingit part of its cultural heritage and will deprive future generations unless changed.*

There are still many older people who have fond memories of family bonding while on family outings to gather eggs in Glacier Bay. That they are prevented from reenacting these times with younger relatives and from symbolically connecting with their ancestors in the homeland not only saddens them but is seen by many to threaten the survival of their culture.

...[M]y mom and dad did it for years, and we used to have seagull eggs every year. And then...they closed everything down, and then pretty soon they had to start sneaking around to get [them]. Now I don't even know what it's like to go out and get seagull eggs. I never got a chance to go out. Only time we'd get to taste them is when somebody went out there and stole some and brought some in... I [also] want my grandsons to try seagull eggs... (female huna elder).

Well, it was hard to accept, you know. Us older people that's used to all these things, you know, we took it for granted. But the young generation will feel bad about it for a short time, and so the Park Service told us we could do this just for your generation. The next generation won't care. This what we're afraid of is when they lose caring. We don't want them to lose it. (female Huna elder)

2. *Elders are deprived of a culturally, socially, and spiritually important food and activity.*

...like this old man Sinclair before he died, he told a judge in Juneau he

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was talking to... "How would you like it if I took your bacon and eggs away from you? And what would you eat after that?" (Huna male subsistence harvester, in his 50s)

...[O]ur heart has been saddened by being barred out of Glacier Bay. You know, our people used to live for that day to start picking. (male Huna elder)

It's kind of a crime... Why can't they let us do it just for our food [referring to taking resources in Glacier Bay]? I told a man in Juneau...from the legislature... I'll give up my subsistence food and go to white-man food, but it's only fair the white people do away with their own food, too. Their steaks, their pot roasts...their chicken... I said, "For every food I give up you give up one too." (female Huna elder)

3. Behavior defined as responsible by the Huna has been criminalized by the dominant society.

A result of this stigma is that those who want to harvest traditional foods must become outlaws. This outcome interferes with interaction between the generations.

For the past 10 years we've [had to behave as] criminals to gather our own food, and were arrested for one or another [activity] that pertained to our customary and traditional lifestyle. (male Huna elder)

I feel at ease with what I do... I am a seagull myself. I come from the seagulls... It's one of my crests... I served in the Vietnam War, and I got an honorable discharge. So I can't say that I disrespect...the laws. I just don't agree with some of them. (Huna male in his 40s)

4. As the original inhabitants, the Huna Tlingit see themselves as the "owners" of Glacier Bay.

Many assert, rightly or wrongly, that they have not signed agreements relinquishing these land rights. The permitting processes can also be seen as demeaning and in conflict with the perception that it is a Huna right (not a privilege) to harvest food in Glacier Bay.

It's always been our rights to be where we're at... Not our privilege. Nothing more, nothing less. That [is] all we ask... (male Huna elder)

...[T]he United States Constitution is very specific in stating that they cannot take any of our land without just compensation... The people of Hoonah who do lay claim to Glacier Bay have never been compensated, even allowed to visit their own homeland [except as dictated by the dominant society]. We do not really consider Hoonah our home. We consider Glacier Bay our home. So we need to do a few things like get our land back. (male Huna elder)

I'm kind of upset at the Park Service having to give us permits for this and that for everything in order to get in there. I mean...we were there even before it became a park...and national monument... [And] now they are talking wilderness and trying to stop us from commercial fishing... It's gonna be a great impact on us. (male Huna elder)

5. The Huna Tlingit believe they have been unfairly deprived of a healthy source of food.

If you get a chicken egg, you get all the chemicals that are put in to a chicken

to lay those eggs, you know. They're not a pure egg... [The] seagull is a natural hunter... so I would prefer to eat that [rather than] to eat a chicken egg if at all possible. (Huna male, tribal leader, in his 50s)

[I am] angry that we have to be dictated on what we have to eat. All of us know that white flour, white sugar, white man's food does not agree with us... Our health...has changed a lot because we have to depend more on the store rather than the land. And our health pays big time. We're having more strokes, more diabetes, more heart problems and of course more alcoholism... I think that we could really begin to heal by [the Park Service] allowing us to eat again—but what our body needs, not what we're dictated to eat. (middle-aged Huna female)

6. The Huna define themselves as integral to the Glacier Bay ecosystem.

From the Huna perspective, their absence from Glacier Bay as part of the food chain alters the natural ecosystem. Being deprived of the ability to take the full spectrum of traditional foods from the Glacier Bay ecosystem has negative cultural, social, and spiritual impacts on the Huna as a people and as individuals. These effects go to the core of Huna cultural and personal identity and represent a profound loss.

Sometimes when someone gives me an egg today... We'll look at the egg. We won't take it [and] eat it right away; we'll look at it. We'll admire it. We'll cherish it. We say these things to ourselves. This may be the last time I may have these eggs. This may be the last time. And some of us, we salt our eggs with our tears... (Huna male, clan house leader, in his 50s).

...[M]any times my people have cried tears over leaving Glacier Bay, and every year at the potlatches that are given in honor of our deceased people, when the Eagle clan is giving the potlatch, the Chookaneidis sing the mourning song for leaving Glacier Bay. And everybody cries because we mourn to this day being forced out of our homeland. And so every year that grief is renewed...I think that without the Huna Tlingit presence, you only get part of a national park... The Huna Tlingits are as much a part of the Park as the glaciers are... as the wildlife is. And to take us and remove us as part of the park, you certainly disintegrate the value...in the end. The Huna Tlingits are going to continue to hammer it home that this is our traditional homeland... (Huna female, tribal administrator, in her 50s).

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**Huna female, tribal administrator,
in her 50s**

In summary, we believe the available evidence supports the following conclusions:

1) The harvest of gull eggs by Huna Tlingit people is traditional.

It was a highly valued, regular activity of many Huna families and integrated into the Huna Tlingit seasonal round of hunting, fishing, and gathering activities.

2) Gull-egg harvests were originally relevant to Huna survival.

More recently, they have been maintained as a minor seasonal nutritional contribution but primarily as a tangible symbol of Huna Tlingit identity.

3) Gull-egg harvests are recalled with a sense of longing by most Huna who remember them. This activity heralded the summer

Egg-gathering sites as “cultural landscapes” and “Traditional Cultural Properties”

The strong attachment of Huna Tlingits to gathering sites such as South Marble Island suggests that these locales may qualify, collectively or individually, as “cultural landscapes” under NPS criteria and as Traditional Cultural Properties under the provisions of the National Historic Preservation Act.*

The NPS (1994) stipulates that a cultural landscape is a geographic area, including both natural and cultural resources, associated with an historic event, activity or person, and identifies four cultural landscape categories: 1) historic designed landscapes, 2) historic vernacular landscapes, 3) historic sites, and 4) ethnographic landscapes.

Categories 3) and 4) may apply to some traditional gathering sites in Glacier Bay. Similarly, according to National Register Bulletin number 38, a Traditional Cultural Property (TCP) is a place that is “eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that a) are rooted in that community’s history and b) are important in maintaining the continuing cultural identity of the community” (Parker & King 1990). Examples include Native American sacred places, cemeteries, gathering sites, and other prominent places that figure in their traditions as well as those of other groups. Although a formal Traditional Cultural Property evaluation is beyond the scope of this investigation, the Huna interview data suggest that the Huna Tlingit may view South Marble Island, and perhaps other key historic landscapes in Glacier Bay, in such terms. A more detailed investigation of egg-gathering sites as cultural landscapes may reveal additional cultural values that these sites hold for the Huna Tlingit beyond egg harvesting and other activities detailed in this report.

season and strengthened ties to the ancestral homeland. Gull-egg harvests were limited to a brief period in late May or June, a time marked by the onset of good weather and the release from the physical and psychological confines of winter. It can be argued that gull-egg collecting in Glacier Bay has actually accrued Huna cultural significance in recent times because of its propensity for sustaining ties to ancestral lands.

- 4) **Gull-egg harvests united families in a common enterprise.** The harvest was a social event. Children traveled with parents and grandparents to Glacier Bay where they were instructed in the proper way to harvest eggs. Many contemporary Huna adults describe the moral instruction they received in conjunction with these family egg-harvest outings. They were shown how to appropriately harvest the eggs out of respect for the gulls and the importance of sharing the harvest with family and community.
- 5) **Historically, Huna gull-egg harvests occurred at multiple sites throughout Huna traditional territory.** In the mid-20th century, harvests by family parties were focused on the Marble Islands. South Marble Island was especially favored because of its relatively easy and safe access.
- 6) **The sites used for gull-egg harvests within Glacier Bay have necessarily changed over the long term because natural succession of vegetation has converted open nesting areas at many colonies to forests unsuitable for nesting.** Simultaneously, retreating glaciers provided open rocky areas suitable for new gull colonies.
- 7) **Although traditional gull-egg harvest strategies varied, most were designed to enhance the quantity and quality of egg harvests while attempting to minimize impacts on gull nesting success.** With some exception, these harvests were apparently based on fundamental knowledge of glaucous-winged gull nesting behavior and ecology. The strategy reported by most consultants involved harvesting eggs from nests with clutches of one or two eggs, ideally early in the season.
- 8) **Although traditional Huna Tlingit gull-egg harvests were not highly ritualized, they were frequently marked by individual spiritual observances.** These included first speaking to the gulls to ask permission to take the eggs or to offer thanks for the harvest.
- 9) **Gull eggs, after refrigeration became available, were consumed mostly at the time of the harvest or shortly thereafter, rather than saved for potlatches or for ceremonial exchange.** Yet their consumption was an event in and of itself in which sharing within the family and throughout the community was highlighted.

10) Huna traditional gull-egg harvests were suppressed by the 1960s with the enforcement of the prohibition of gull-egg harvesting within Glacier Bay National Monument. Although most Huna consultants had no direct personal experience of enforcement actions by Park personnel, all were aware of specific incidents. Many report having abandoned egg harvesting to avoid confrontations with Park authorities.

11) Virtually all consultants objected, at times bitterly, to the prohibition of their gull-egg harvests and voiced strong interest in resuming legal gull egg harvests within GNNPP.

These research findings are intended to be relevant to GBNPP managers, to the Huna Tlingit people, and to other stakeholders interested in ongoing discussions of the traditional and contemporary uses of natural resources by the Huna Tlingit. They are also meant to help National Park Service interpreters educate park visitors about Glacier Bay's cultural significance to the Huna Tlingit. This study was not funded to discuss gull-egg harvests in broader academic contexts—as found in the literature on traditional environmental knowledge, ethno-ecology, indigenous conservation, and common property—nor are our results intended to be discussed relative to the wealth of information available through the Subsistence Division of the Alaska Department of Fish & Game.

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