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Square Sails on the Chilkoot Trail: The Vernacular Watercraft of the Klondike Gold Rush

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Rush**

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Abstract

This thesis examines the vernacular watercraft of the Klondike Gold Rush (1897-1900). Thousands of gold seekers from around the world reached the Klondike gold fields by traversing the Chilkoot and White Pass Trails, then building over 8,000 wooden vessels, used to navigate Canada's Upper Yukon River. Only a few remains of the gold rush flotilla have been found, and the vessels have thus far received little attention. Historical, archaeological, and photographic evidence have been used to identify the types of vessels built, their design and construction influences, and features that will help to identify and interpret future finds. The gold rush vessels are viewed as expressions of behavioral variants that illustrate the adaptation process of gold seekers en route to the mining frontier. Data have been collected from gold seeker narratives, government documents, archaeological reports, and archival photographs. This thesis contributes to a more in-depth understanding of the gold rush vernacular watercraft, and demonstrates that the gold seekers chose to build and use vessels that were suited to the natural and economic environments along the Chilkoot Trail.

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I

Introduction

During the Klondike Gold Rush, 1897-1900, between 30,000 and 40,000 gold seekers traversed the Chilkoot and White Pass Trails to Lakes Lindeman and Bennett, the headwaters of the Yukon River (Thornton et al 2004). Lake Bennett was the terminus for both trails, however the majority of gold seekers took the Chilkoot Pass Trail, which from the eastern side of the summit led through a series of alpine lakes to Lake Lindeman. From Lakes Lindeman and Bennett, the gold seekers used an estimated 8,931 boats, most of them built at the lakes, to continue down the lake and river system to the Klondike gold fields. While steamships carried the argonauts north to Alaska, it was the small, vernacular boats built at Lakes Lindeman and Bennett that carried tens of thousands of people into the Yukon.

Gold seekers could readily purchase all of the things that they needed to travel to, and survive in, the Canadian sub-arctic, including manufactured canvas canoes and knockdown boats. Many who took part in the stampede to the Klondike had no previous experience with woodworking, boat building, or river navigation. Despite the availability of manufactured small watercraft, individuals, small prospecting parties, and commercial boat builders built a flotilla of wooden boats for use along the inland waterways. Current understanding of the vernacular watercraft of the Klondike Gold Rush is limited. Given the large number of Klondiker boats, there is relatively little information regarding them. A baseline study is important for aiding in identification, interpretation, and ultimately preservation should more gold rush vessel remains be found.

North American small watercraft has been a topic of limited inquiry. Peterson noted the study of small craft in North America is in its infancy and lacks “a well developed literature, a widespread understanding of the nature and value of the resource, and taxonomic and theoretical systems for describing and explaining the phenomena” (1989:60). Two decades later, this statement still applies. Chappelle (1951) in his seminal work, *American Small Sailing Craft: Their Design, Development, and Construction*, has laid the foundations for future investigations. However, his work is largely centered around small watercraft on the eastern seaboard, with minimal investigations of western variants. Study on non-indigenous small craft of the west coast includes coastal vessels such as those employed in the salmon fishing industry (e.g., Moore

1993). While studies of the small craft of the Klondike Gold Rush have been limited to historical overviews and assessments of extant remains without providing a typology, theoretical background, or discussion of the vessels within a larger social or economical context (e.g., Neufeld 1991; 1993, Waddell 1979).

Small watercraft can be particularly difficult to classify. Many American small craft are of a common prototype, often with European origins, but developed regional differences both in construction details and names. Peterson (1989) argues for a standardized taxonomy of small craft in America, believing that it is important for the preservation of vernacular watercraft. Kimmel stresses the need for a small craft database stating that “there is no reason to believe that small craft will be any less valuable than any other major artifact class once their characteristics as formal types are more clearly understood in terms of formal variation, function, chronology, distribution, and association with other assemblage items” (1989:64). While Mark Leone asserts that, “understanding ships as part of land-based economic processes, particularly those of capitalism, allows for the creation of a larger context.” (1983:187). Presently characteristics of the Klondike Gold Rush small craft are not understood and they have been an underused category of artifact with which to examine the gold rush.

Archaeology seeks to gain an understanding of past cultures through their material remains. Much of the Klondikers’ material culture was made up of manufactured items. The overwhelming exception to this are the vessels built along the Chilkoot Trail. This thesis views the Klondike Gold Rush as a cosmopolitan mining frontier operating within a world-economy, and seeks to explain the vernacular watercraft by viewing them as a material expression of the Klondikers’ process of adaptation in the sub-arctic riverine environment. The study of the vernacular watercraft provides a way of analyzing elements of change along the gold rush trail between 1897 and 1900.

Models of adaptation have been used to study mining frontiers around the world. Cheney (1992) has used the Swiss Family Robinson model, while Hardesty (1988; 2003) has employed a Darwinian evolutionary approach. These two models both view adaptation in a mining frontier in a similar three-stage approach. The first stage is short-lived, and sees colonizers dependant upon imports with a low variability in their behavior (Cheney 1992; Hardesty 1988). In the second stage of colonization, behavioral variability is increased as colonizers try to adapt to their environment and the new set of problems they are faced with (Hardesty 1988). In this stage,

community building is an important coping strategy (Cheney 1992). In the third stage, colonizers have adapted to their environment and their behavioral variability has decreased again, with successful strategies and solutions implemented (Cheney 1992; Hardest 1988).

This thesis seeks to examine Klondiker adaptation along the Chilkoot Trail as a three-stage approach through the vernacular watercraft. This study is not meant to be a definitive discussion of gold rush boats but aims to begin a discussion on this topic and provide a step towards understanding an aspect of the Klondike Gold Rush that has been overlooked. In addition, this thesis proposes a standard of watercraft recording amongst gold rush vessels. Previous archaeological investigations along the Chilkoot Trail are inconsistent in their recording of cultural material and show that a standardized approach is needed in future studies. This study aims to begin the identification of Klondike Gold Rush vessel types, construction influences, and features, with the hope to fill in some of the gaps in knowledge and promote further research into this matter.

Research Questions

Several research questions are explored in this study. The Klondiker boats built at Lakes Lindeman and Bennett have been described as being made up of numerous and improbable boat types, and have been dubbed by journalist Pierre Berton as the “most bizarre fleet ever” (1958:277). Therefore, the first question this thesis asks is: what types of boats the gold seekers along the Chilkoot Trail and Upper Yukon River used during Klondike Gold Rush? The Klondike Gold Rush was an international event with many of the participants coming from around the world, and many of those who came from the United States were themselves recent immigrants. In addition to the influx of people from around the world, several indigenous tribes occupied the region and had developed watercraft for use along the lake and river system that eventually became the gold rush trail. The geographical location of the gold rush, coupled with the lack of infrastructure certainly produced environmental and economic factors that influenced boat building. Given this mix of people in a sub-arctic riverine environment, the second question asks: what were the influences in Klondiker boat types and construction methods? The third question asks: in what ways do the Klondikers’ watercraft illustrate their adaptation in their new environment? And finally: if more gold rush boat remains are to be found, what might they look like?

Methods

This study uses the results from previous archaeological investigations conducted by Vickers (1978), Waddell (1979), and Murray and Hamilton (1984), done on behalf of Parks Canada and the National Park Service as preliminary investigations to the designation of the Chilkoot Trail as a national park in both countries. In addition this study uses some of the results of Easton's (1986) underwater survey of the Yukon River. Waddell performed an underwater survey of the alpine lakes, Lakes Lindeman and Bennett and areas along the Upper Yukon River. Murray and Hamilton performed shore based surveys at the alpine lakes and Lakes Lindeman and Bennett, while Vickers performed a shore based survey at Lakes Lindeman and Bennett. Easton performed an underwater survey of the Upper Yukon River. Vernacular watercraft remains were located in both Waddell and Easton's surveys, but the finds were limited. The shore-based surveys found no vessel remains but located features that were associated with gold rush lake and river transportation.

The paucity of gold rush vessel remains in the archaeological record necessitates an expanded inquiry into this subject that includes written and photographic documentary evidence. Methods employed in this thesis include a study of several primary sources such as Klondiker narratives and the records of the North West Mounted Police (NWMP), as well as a study of the archival photographs that exist in online and traditional archives. Photographs have been accessed from the University of Washington Special Collections, the Yukon Archives, and the University of Alaska Fairbanks. The textual, archaeological, and photographic evidence are presented in separate chapters, with a combined analysis in Chapter 8.

Limitations

The conclusions reached in this study of Klondiker watercraft are based on information gained through historical texts, archaeological material, and archival photographs. There are limitations with regards to this study with each of these methods, and these limitations are acknowledged here. The dearth of available archaeological material is an obvious limitation, and the sample size for this investigation is very small. In addition, most of the watercraft remains are from the alpine lakes east of the Chilkoot Summit and are presumed to have been part of the ferry service that operated there. Very few vessel remains have been located further downstream. However,

the remains at the alpine lakes indicate what materials were used for boat building as well as contemporary construction techniques.

Historical texts and archival photographs are incorporated as supplementary evidence in the study. These methods are also fraught with their own limitations. Klondiker narratives that discuss boat building often give overall dimensions, occasionally specify boat type, and rarely discuss in detail construction methods or choice in boat type. However, as previously noted, the archaeological material helps to fill in the gaps in the historical narratives by providing information regarding construction techniques.

The archival photographs illustrate both the vast numbers of boats built by the gold seekers, as well as construction variability within the fleet. While the photographs help to produce an overall image of life at the boatbuilding centers and the vernacular watercraft, they lack information such as the vessel's actual size, and do not always illustrate vessel construction. However, they can illustrate elements of gold rush boats, such as sails and rigging, which we would be unlikely to discover in the archaeological record.

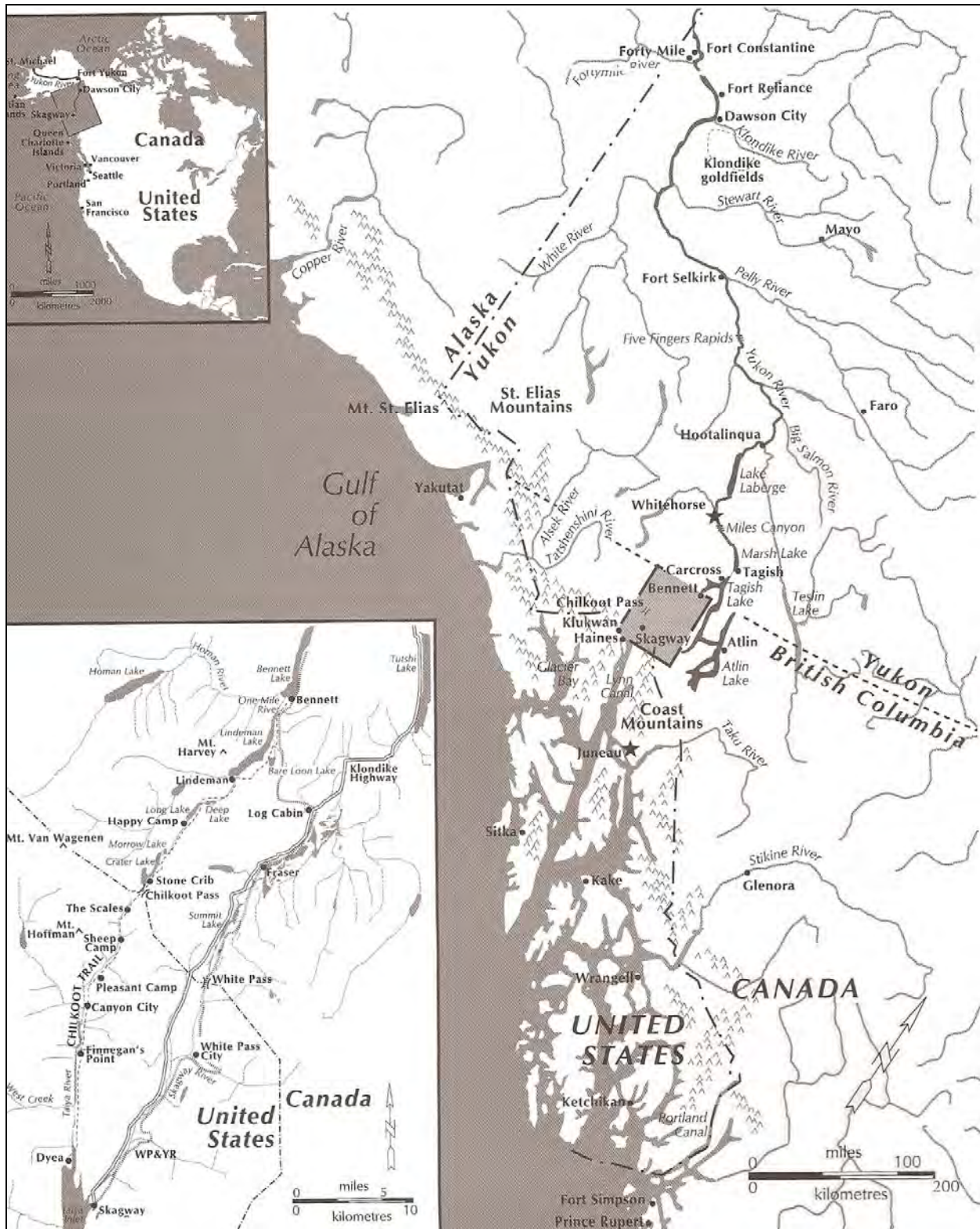


Figure 1. Map of the Klondike Gold Rush region and Chilkoot Trail. Chilkoot Trail: Heritage Route to the Klondike by David Neufeld and Frank Norris, Harbour Publishing, 2005.

II

The Gold Rush in Context

The purpose of this chapter is to illustrate the larger context of the gold rush, showing links between the environment, economy, and the political atmosphere, as well as to highlight the morphology of inland transportation along the Chilkoot Trail and Yukon River. To understand Klondiker watercraft, it is important to understand the development of the region in which the boats were used. This chapter aims to identify the precursors of the stampede to the Klondike through the Chilkoot Pass and demonstrate the link to the development of the gold rush fleet of inland watercraft.

Exploration into the North American sub-arctic by English and Russian fur traders preceded the Klondike Gold Rush, opening up trade networks with indigenous populations and establishing trading posts along both the Alaskan coast and the interior river systems of Alaska and Canada. After the sale of Alaska to the United States in 1867, American fur traders utilized the already established trading posts for continued resource exploration. News of large gold deposits in the Canadian Yukon, along with a depressed American economy in the early 1890s saw a major influx of people to the sub-arctic in search for gold.

The Chilkoot Trail was one of the several Tlingit Indian trade routes to the interior from coastal Alaska. Early prospectors and government surveyors used this route to enter into Canada's Yukon Territory. The Chilkoot Trail was the least expensive and a relatively fast route to the gold fields. Therefore it developed as a popular route to the Yukon during the gold rush. Winter passage to Dawson could be done following the river system using snowshoes and sleds. However, most people chose to use watercraft to transport themselves down the Yukon River in the summer months.

2.1 Geography and Vegetation of the Chilkoot Trail

The 32-mile (53 km) Chilkoot Trail leads from the Dyea, at the head of the Lynn Canal, over the coastal mountain range to a series of lakes that are the headwaters of the Yukon River. Dyea is situated within a coastal rainforest. From Dyea the trail winds 14.75 miles (23.74 km) up the Taiya River valley to the summit of the Chilkoot Pass, at 3,500 ft (1,067 m). Once over the pass, a chain of small alpine lakes stretches 10 miles (16 km) to the larger Lake Lindeman. The boreal

forest begins approximately at the end of the alpine lakes and includes evergreen and deciduous trees. The evergreen species include lodge pole pine (*Pinus contorta*), alpine fir (*Abies lasiocarpa*), black spruce (*Picea mariana*), and white spruce (*Picea glauca*). The deciduous species of the area include black cottonwood (*Populus trichocarpa*), trembling aspen (*Populus tremuloides*), and balsam poplar (*Populus balsamifera*) (Neufeld and Norris 1996:18). Lakes Lindeman and Bennett, 26 and 33 miles (41.8 and 53.1 km) respectively from Dyea, were the first lakes east of the Chilkoot Summit where trees large enough for boat building could be found. From Lake Bennett, the route to the Yukon extends northwest for approximately 540 miles (869 km) through a series of large lakes separated by rapids, which eventually drain into the Yukon River. Dawson is located at the confluence of the Yukon and Klondike Rivers. The boat journey from Lake Bennett to Dawson averaged about three-weeks. Figure 2 shows the Chilkoot Tail in profile form from the trailhead at Dyea to the trail's terminus at Lake Bennett.

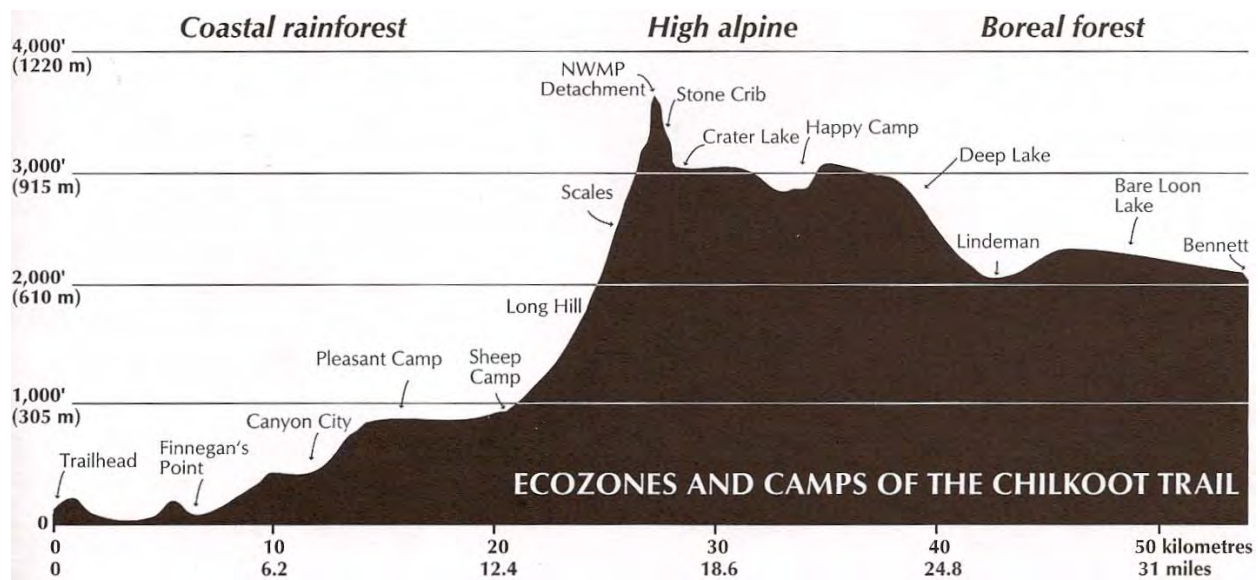


Figure 2. Ecozones and camps of the Chilkoot Trail. *Chilkoot Trail: Heritage Route to the Klondike* by David Neufeld and Frank Norris, Harbour Publishing, 2005.

2.2 Indigenous Tribes of the Region

The indigenous tribes inhabiting the area between Dyea and Dawson are comprised of several different groups with extensive trade networks. Trade between the coast and the interior was important on both sides as resources were exchanged and alliances through kinships formed (McClellan 1975:37). The coastal Tlingit had several villages within the Lynn Canal at the time

of the gold rush, including one near Dyea. The coastal Tlingit had rich marine resources, namely salmon, that allowed for year-round habitation of a specific area. In contrast, the interior First Nations people relied on a more sparse distribution of available food and had smaller, more mobile populations (McClellan 1975). The Chilkoot Trail was one of several important trade routes into the interior and was controlled by the coastal Tlingit, who made yearly ventures inland each spring. Trade often took place just north of what would later be named Lake Bennett (Neufeld and Norris 1996:27).

Inland tribes of the southern Yukon Territory are the Tagish, the Inland Tlingit and the Southern Tutchone. These three groups are distinguished linguistically. However, they differentiate between themselves based on common subsistence patterns and technology, rather than linguistically (McClellan 1975:14). The Tagish, along with the Tlingit, worked as packers and guides for early prospecting parties and government expeditions into the Yukon.

Farther north along the river system were the Tr'ondëk Hwëch'in, who occupied the area at the confluence of the Yukon and Klondike Rivers that eventually became the town of Dawson. During the gold rush, the Tr'ondëk Hwëch'in were relocated to a new settlement several miles down the river. The relocation effort was conducted through collaboration between the NWMP and Anglican missionaries in order to protect the Tr'ondëk Hwëch'in from what the Anglican Bishop Bompas thought would result in a "relapse to heathenism" should they live in the same town as the gold miners (as cited in Coates, 1991:84). The Tr'ondëk Hwëch'in did not integrate into the non-native society of Dawson, but remained on the fringe, performing functions such as provisioning the miners with fish and game (Coates 1991).

Indigenous Transportation

Indigenous transportation along the trading trails included the use of boats, rafts, toboggans and snowshoes. The origin of toboggan use is unknown; although early fur traders may have introduced toboggans to the area (McClellan 1975). Snowshoes however, were a necessity for winter travel through the region and many tribes attribute their knowledge of snowshoe technology to the willow ptarmigan, whose feathered feet in winter allow them to walk on top of the snow (Krause and Krause 1993; McClellan 1975).

Indigenous watercraft in this region was varied. The coastal Tlingit used dugout canoes at the coast, but are known to have built rafts when trading inland (Campbell 2003; Thornton et al

2004). The inland tribes used a variety of watercraft including spruce bark and birch bark canoes, skin boats, cottonwood dugout canoes and rafts (McClellan 1975). Watercraft were poled, paddled, and sailed. Square sails made of moose hide were used on dugout canoes, especially when traveling on the lakes. However, it is thought that these sails were not used prior to the gold rush (McClellan 1975).

Mineral Knowledge

The Indigenous populations of Alaska and Canada were not ignorant of the presence of precious metals in their territory. Copper was a valuable trade item between coastal and interior tribes but gold was not valued prior to the arrival of whites (Thornton et al 2004). It was Tlingit knowledge that led to the discovery of gold in 1880 by Joe Juneau and Richard Harris along what is now known as Gold Creek (Hine and Faragher 2000). The interior First Nations people also knew of gold in their region. Skookum Jim and Tagish Charlie, Nations tribal members, along with George Carmack, a white prospector, sparked the stampede to the Klondike when they found gold along a tributary of the Klondike River in 1898.

2.3 The Fur Trade and European Colonization

European colonization of arctic and sub arctic North America first took form in the fur trade. Russian fur traders operated in what is now Alaska, initially on the resource rich coastline, but eventually moving inland along the river systems as they depleted the coastal marine resources. Likewise, Canada saw early colonization by fur traders in the Yukon Territory, who sought out the pelts of fur bearing land mammals. Fur trade access in the western Canadian interior relied heavily on bark canoes along the extensive river systems (Adney and Chapelle 1964). In areas where birch bark was limited, spruce bark canoes were more common (Campbell 2003).

The Coastal Fur Trade

Russian exploration into Alaska began in 1732 with the landfall of the *Sv. Arkhangel Gavriil* on the northwest coast of Alaska (Black 2004). Nine years later, in 1741, Captains Chirikov and Bering made landfalls on Alaska's southern shores. During the 1741 expedition, Bering and his crew, ill with scurvy, were unable to return to Russia before winter set in. They were forced to over-winter on one of the Commander Islands at the western end of the Aleutian Islands. Bering

and several of the crew died, leaving the remaining crew to fend for themselves. The surviving crew harvested marine mammals for food and furs and repaired their boat, sailing back to Russia the following spring with tales of the abundance of fur bearing marine mammals, especially the sea otter, whose pelt was “coveted by the Chinese” (Black 2004:59).

The ensuing years saw increased Russian fur hunting activity in Alaska, first by small hunting parties and then by merchants who continually expanded to the east in search of new hunting grounds. This expansion to the east led Russian fur hunters into Tlingit territory in the Gulf of Alaska and the Alexander Archipelago. Russian expansion into Tlingit lands was fraught with skirmishes but the Russians succeeded in establishing themselves in Tlingit Territory (Black 2004). By 1799 the Alaskan fur trade was monopolized by the Russian American Company (RAC), who made regular visits to the Sitka-Angoon region establishing a fort at Novo-Arkhangel'sk (modern day Sitka) that same year. Fighting between the Tlingit and the Russians continued as the Russians expanded their reign in Tlingit territory by making their fort at Novo-Arkhangel'sk the Russian American capital in 1804 (Black 2004).

The Interior Fur Trade

By 1818 the RAC was seeking to explore the interior of Alaska, looking towards land mammal furs as a new source of revenue. An interior expedition was ordered in 1829 with the aim of surveying three rivers, the Nushagak, the Kuskokwim and the Yukon (Khlebnikov 1994). Along with obtaining information pertaining to the geography of the interior and the inhabitants, the Russian party was to report on the flora and fauna, specifically fur bearing mammals such as the beaver. Additionally, the expedition members were to investigate native trade in the interior to determine if the Hudson's Bay Company had been trading in the region (Khlebnikov 1994).

The Hudson's Bay Company (HBC), established in 1670, entered the fur trade in Canada's Hudson Bay drainage. Competition with the North West Company in western Canada eventually led to a merger of the two companies in 1821 (Arndt 1996). The HBC continued to expand into the Yukon in the mid-19th century to procure land mammal furs. HBC traders first encountered the coastal Chilkat Tlingit in 1843 when the Chilkat arrived on rafts at the HBC trading post on the forks of the Pelly and Lewes River (Campbell 2003).

The RAC economy was initially based around sea mammal furs, but declining sea mammal populations saw the Russians increasingly turn to land mammal furs. Initial contact

between the Chilkat Tlingit and Russian fur traders was as early as 1788, but saw limited contact until the mid-nineteenth century when the land mammal fur trade became more important (Thornton et al 2004). The mounting reliance on land mammal furs by the Russian's escalated trade between coastal Tlingit and interior natives (Thornton et al 2004:106). The RAC, through Tlingit traders, began competing for resources with the HBC in the area of the Lewes and Pelly Rivers. A boundary dispute between Russia and England in 1825 resulted in a border being established at the 141st meridian from the Arctic Ocean down to Mount St. Elias, then continuing south along the coastal strip of the mainland to 54°40' south (Coates and Morrison 1988:16). This boundary line still exists today (see Figure 1) as the Alaska and Yukon boundary. Despite this boundary being drawn, the HBC continued to advance into Russian territory, west of the 141st meridian, establishing Fort Yukon in 1846 (Coates and Morrison 1988). The boundary dispute between England and Russia went unresolved until after the sale of Alaska to the United States in 1867, prompting government surveys of the region.

2.4 Americans in the North

Americans were all too eager to establish themselves along the Pacific Coast in the 19th century and did so by taking part in maritime ventures such as the fur trade and whaling. The Napoleonic Wars in Europe resulted in increasing difficulty for Russia to provision their Alaskan colony leading to the Russian settlement at Fort Ross in California in 1812 (Black 2004). However, Fort Ross was unable to fully supply the colony in Alaska and the RAC had to rely on trade with British and American ships who traveled the Pacific between Alaska, California, Hawaii and Canton (Khlebnikov 1994). While the Russian's relied upon the British and American ships for trade, they simultaneously hoped that the foreign traders would cease to visit Alaska's coast as they interfered with the Russian's own trade with the Tlingit (Khlebnikov 1994). This however was entirely wishful thinking on the Russian's part. American ships continued to visit Alaskan waters. By 1845 there were 263 American whaling vessels known to be operating within Russian America (Black 2004).

The Russian's tenuous hold on Alaska's resources was noted by the United States. In a speech made in 1860, Secretary of State William Seward declared that Russian outposts along the west coast of North America would become the outposts of the United States (Seward 1891). Russia felt that the colony in Alaska was becoming increasingly difficult to defend, especially

from the British, and eventually offered to sell Alaska to the United States (Black 2004). The purchase was finalized in 1867 and Americans began moving north to settle in the new territory. Prior to the finalization of the sale of Alaska to the United States, speculators were staking out private property in the soon to be new American territory and “land-grabbing individuals were on shore in Sitka [formerly Novo-Arkhangel’sk] staking out claims in the town” (Black 2004:286). One “godless individual” even tried to stake a claim on the Russian Orthodox Church and its surrounding property (Naske and Slotnick 1994:66).

The fur trade in Alaska continued during the early American period. The Tlingit sold furs from the Yukon to American fur traders at the coast, and they guarded control of their trade routes (Neufeld and Norris 1996). In addition, the Alaskan Commercial Company, who had exclusive rights to the Pribilof Island fur seal industry, had also taken over Fort Yukon from the HBC (Naske and Slotnick 1994). Napoleon “Jack” McQuestern and Arthur Harper, agents of the Alaska Commercial Company, had been trading in the Yukon since 1874 and were instrumental in opening up the Yukon to mining during the last part of the 19th century (Naske and Slotnick 1994; Ogilvie 1898). American fur traders in the interior of Alaska grubstaked mining prospectors, supplying them with food and other necessities for a season in return for a share of their profits. By 1896, half of the estimated 1,600 people in the Upper Yukon Basin were grubstaked by fur traders (Alaska History and Cultural Studies 2009). With Yukon trading posts still operating and able to supply prospectors, mining exploration continued. The first prospectors to the Yukon arrived in 1873 following the old HBC route over the Mackenzie Mountains (Neufeld and Norris 1996). In 1878 prospector George Holt traversed the Chilkoot Pass prompting others to follow in ensuing years (Ingersoll 1897; Ogilvie 1898).

The Chilkoot Trail Opens for Prospectors

When the United States took possession of Alaska they did so under military force for the first ten years and without the intention of mutual benefit for the native population (Thornton et al 2004:116). The Tlingit, angry at their land having been sold without their consent and without seeing any of the profits, considered the sale of Alaska illegal (Thornton et al 2004). It was with the backing of the United States Navy, who stationed vessels in Lynn Canal, that the Chilkoot Trail was opened up to white prospectors in the 1880s. Along with this show of force, the US Navy showed diplomatic cunning in obtaining the Tlingit permission to use their trail by co-

opting the Tlingits' own world views on trade and hospitality, which called for reciprocity as well as for liability of foreigners on their land (Thornton et al 2004:122).

Initially the Tlingit were reluctant to allow prospectors to use their trails but relented with the agreement that prospectors would not interfere with the Tlingit fur trade (Neufeld and Norris 1996). The Chilkoot Trail was less profitable than the nearby Chilkat Trail; therefore this was the first trail the Tlingit opened up to prospectors. The Tlingit aimed to maintain control of the Chilkoot Trail by accompanying prospectors over the pass to the alpine lakes and packing their outfits for a fee (Neufeld and Norris 1996). They maintained their dominance in packing over the Chilkoot Trail in the early years but as more miners swarmed the area, several non-native commercial transport operations established themselves. By 1898 the Tlingit had lost control of the packing business (Neufeld and Norris 1996).

Government Expeditions Along the Chilkoot Trail

At the end of the 19th century government exploration and mapping expeditions of Alaska and the Yukon began in earnest and were carried out by various geographical and governmental organizations. Aurel and Arthur Krause, representing the Geographical Society of Bremen, were invited to the Chilkat region in 1881 to make observations on the Chilkat Tlingit (Webb 1985). In 1882 Arthur, guided by several Chilkat Tlingit, took their trail over the Chilkoot Pass to Lake Lindeman, which he named in honor of Dr. Lindeman of the Bremen Geographical Society, providing the first mapping of the area (Webb 1985). Krause met a party of American gold prospectors building boats at Lake Lindeman when he arrived there in 1882, unfortunately he did not provide a description of the prospectors boats.

The following year, 1883, the United States Army sent Frederick Swatka to the Yukon via the Chilkoot Pass. He was to gather information about the Yukon and its inhabitants and to map the area for the benefit of the military (Swatka 1885). Swatka and six others traversed the Chilkoot Pass, enlisting the help of several Tlingit and Tagish packers to carry their supplies from the mouth of the Taiya River to Lake Lindeman. At Lake Lindeman, the Tagish packers produced two dugout cottonwood canoes that they had stashed there. Swatka was not particularly impressed with the design or construction of the native canoes. Nonetheless, he used the canoes to transport 400 lbs (180 kg) of his outfit (Swatka 1885).

Not fully trusting the native watercraft, Schwatka built a raft to continue down the river. The raft was built with “stunted spruce and contorted pine” and measured 15 x 30 feet (4.57 x 9.14 m) with an elevated deck amidships. The logs were trunneled together then lashed with rope. A simple rig was fashioned by mortising a pole into a central log at the bottom, and using four ropes as guy wires. A wall tent acted as a sail, with “the ridgepole being the yardarm” (Schwatka 1885:96). Once launched, Schwatka discovered that his raft was not sufficiently buoyant to hold the crew and their supplies. After shooting the rapids between Lake Lindeman and Lake Bennett, the raft was increased in size to 16 x 42 feet (4.88 x 12.80 m), with two elevated decks (Schwatka 1885).

Along with his disdain of the native watercraft, Schwatka also disregarded the local place names and adorned the landscape with new names; among them are Lake Bennett, Marsh Lake, Miles Rapids and Miles Canyon. The party eventually made it to Fort Selkirk and then down to St. Michael at the mouth of the Yukon River (Schwatka 1885).

Four years after Schwatka ascended Chilkoot Pass and descended the Yukon River, William Ogilvie led a party over Chilkoot Pass as a member of George Dawson’s 1887 Canadian expedition to the Yukon. Like Schwatka, Ogilvie also used Chilkat and Tagish packers. Among them were the soon to be famous Skookum Jim Mason, Tagish Charlie and the American, George Washington Carmack, who together, later that year, made the gold strike that started the Klondike Gold Rush (Webb 1985). Ogilvie made the trip down the lake and river system using two Peterborough canoes and a boat that his party built at Lake Bennett (Ogilvie 1898). During his Yukon survey in 1887, Ogilvie noted “not less than one thousand men” were prospecting for gold in the Yukon (Ogilvie 1898:10).

2.5 The Gold Rush

A series of gold strikes in the North American west began with the 1848 California gold rush. Gold strikes were made in British Columbia and Colorado in 1858, and in Nevada a year later (Hardesty 2003). In 1862 gold was again found in British Columbia and continued discoveries in the 1870s were made in the Cassiar region, accessed via the Alaskan seaport of Wrangell (Naske and Slotnick 1994). In 1876 gold was found in the Black Hills of South Dakota, and again in Colorado at Cripple Creek in 1892. All of these gold strikes resulted in an influx of people hoping to strike it rich. They came by the thousands, from the Eastern United States and Canada,

and as far away as Europe, Australia, South America, China, and Mexico (Hardesty 2003:84, 85). Gold strikes occurred in several locations throughout Alaska in the 1860s, 1870s, and 1880s. By 1881, the gold mining town of Harrisburg (present day Juneau) was linked by a monthly boat to the Pacific ports of Portland and Victoria (Naske and Slotnick 1994).

At the end of the American Civil War in 1865, America began a process of industrialization and firmly rooting itself in a capitalistic economy (Ayers et al 2009). This came with a series of economic boom and busts, and by the early 1890s America was in a depression. The panic of 1893, the effects of which would last four years, saw six hundred banks fail, fifteen thousand businesses close and 2.5 million Americans unemployed (Ayers et al 2009). With America experiencing economic hardship, news of the SS Excelsior landing in San Francisco and the SS Portland landing at Seattle, both having returned from the Yukon River in June 1897 with \$750,000 and \$800,000 respectively in gold dust, created an instant sensation. The stampede to the Klondike began.

Outfitting the Stampede

Outfitters were already a part of the American West tradition by the time of the Klondike Gold Rush. The Chicago Record (1897) advised Klondikers entering the Yukon to take 4 1/2 to 5 1/2 pounds (2-2.5 kg) of food per day per man, or about 1600 pounds (726 kg) of food for a year. The ability to do this was due to 19th century food preservation techniques, such as canning and condensing, that were suited to mass production (Archibald 1972). Along with their food rations, gold seekers entering the Yukon had to carry their “homes” literally on their backs at times; taking at a minimum, tents, stoves, sleeping bags, dishes, tools, and clothing.

The west coast cities of San Francisco, Portland, Tacoma, Seattle, Vancouver and Victoria were all vying for Klondiker business. They aimed to outfit the stampede and provide transportation to the north. The North American Transportation and Trading Company chose Seattle for its Pacific entrepôt. Seattle began an advertising campaign to draw gold seekers through their town for outfitting and steamship travel to Alaska resulting in \$10 million worth of business for its merchants (Archibald 1972). Abraham Smith, writing for the United States Consular report in 1898 noted that the previous year Seattle had “managed to grasp at least two-thirds of the outfitting trade, but this year, Victoria merchants have spared no effort to win their share of the coming avalanche” (Smith 1898:95). Smith reported that “the crowd [was] coming

not only from this continent, but from the Old World and the antipodes...the steamship Warrimoo... brought nearly a hundred [gold seekers] from Australia” (1898:95).

The old fur trading companies of the north were also important in outfitting and transporting Yukon bound gold seekers. The Alaskan Commercial Company, based out of San Francisco, had taken over many of the Russian American Company fur trading posts and continued to supply Alaska and the Yukon with commodities. The Hudson’s Bay Company outfitted Klondikers who embarked on their journey north from Victoria or Vancouver.

Routes to the Yukon

The success of the west coast port cities in drawing gold seekers from afar meant that most gold seekers traveled to the Pacific ports and chose between four northbound routes. Canada’s interior city of Edmonton also tried to campaign for Klondiker business and marketed their city as the starting point for the “all Canada route.” The four Pacific routes and the overland route from Edmonton each posed challenges for the gold seeker. In the end, most chose the Chilkoot Trail, as it was the fastest and least expensive way to the Yukon.

The easiest but most expensive route was the all-water route. Gold seekers could take a steamship from Seattle to St. Michael at the mouth of the Yukon River. From Saint Michael they transferred to a shallow draught sternwheeler traveling up the Yukon River to Dawson. This route was limited to summer transport, between June and September.

The all-Canada route was based on the old routes of the Hudson’s Bay Company into the Yukon. It was actually two different routes through the Canadian interior; one route was largely overland and one largely using the river system. However, neither route was well defined, nor lived up to the promise of being a quick passage to the Yukon (Bennett 1978).

The other routes were Tlingit trade routes into the Canadian interior, and began from seaports along the Inside Passage. The Stikine River route began at Fort Wrangell, while Dalton’s Trail began near Haines. Both were long and difficult overland journeys until they met up with the Yukon River or one of its tributaries. Dalton’s Trail was 350 miles (563 km) overland until it reached the Yukon River. Jack Dalton, who had explored the area in 1890, marked out and improved the trade route in 1896. He charged \$250 for passage with animals and patrolled the route with a rifle and pistol to ensure payment (Webb 1985). This “improved” trail

was difficult to travel with pack animals, and some who began their journey on it ended up turning back and going over the Chilkoot Trail instead (Shape 1998).

From the head of the Lynn Canal, the gold rush route to the Yukon led from either Dyea or Skagway. Klondikers could hike over either the Chilkoot or White Pass respectively. Both trails converged at Lake Bennett and were difficult traversing from the tidewater to the summit. However, the Chilkoot Trail from Dyea at least afforded the Klondikers a chance to ferry their outfits across the alpine lakes. Once successfully over either summit, most Klondikers constructed boats and used the lake and river system to take themselves and their outfits the remaining 540 miles (869 km) to Dawson. Between 1897 and 1899 the Chilkoot Trail was the most heavily used of any route to Dawson. The completion of the White Pass Railway from Skagway to lake Bennett in 1899 virtually ended Klondiker foot traffic over the passes. When the railroad pushed through to Whitehorse the following year, Bennett City became a ghost town.

2.6 Summary

The fur trade brought white colonizers into the North American arctic and sub-arctic. As marine furs declined in availability, land furs become increasingly important. Both the British and Russian fur traders relied heavily on the indigenous population to procure furs. Indigenous watercraft as well as the watercraft of the Hudson's Bay Company fur traders along the Chilkoot Trail and Upper Yukon River was varied and included rafts, birch and spruce bark canoes, dug out canoes and skin boats. Indigenous groups had long established ties with each other and guarded their trading routes until they were eventually forced to open them up for access to the Yukon. The fur trade expanded Yukon exploration and established trading posts that were later important in supplying gold prospectors.

A changing world economy saw new extractive industries develop in the north. However, the Russian government decided to sell Alaska to the United States, in part because they could not successfully defend it from foreign threats. After the sale of Alaska, American settlement of the new territory began and the extractive industries further developed. Government mapping expeditions of Alaska and the Yukon also expanded during this time, with expedition parties using native watercraft, manufactured canoes, and their own rafts and boats built at Lake Lindeman to access the Yukon region.

A succession of gold strikes saw Americans venture further into the north in search of gold. A depressed American economy along with news of huge gold strikes in the Yukon brought in thousands of prospectors from all around the globe to the Canadian sub-arctic. American and Canadian Pacific port towns responded quickly to the gold rush by offering services such as outfitting stores and transportation to Alaska and the Yukon. The most economical route to the Yukon was over the Chilkoot Pass, which had been a long established Tlingit trade route. Once over the Chilkoot Pass, Klondikers followed in the tradition of earlier prospectors and explorers of building their own watercraft at the shores of Lakes Lindeman and Bennett for continued travel to the gold fields at Dawson.

III

Previous Research

This study endeavors to identify gold rush vessel types, the influences on boat building, and features of the gold seekers' vessels that can assist in identification and interpretation of any future small craft finds along the gold rush trail. The study of small, inland watercraft in the Canadian and American Northwest has not received considerable attention. The study of the small, inland watercraft of the Klondike Gold Rush has received even less. This subject area is lacking in both archaeological, and to a lesser degree historical information. This chapter will review previous work on small watercraft and inland watercraft of North America. It will also present an overview of previous research on the gold rush through the Chilkoot Trail and earlier attempts at describing the flotilla of gold seeker boats.

3.1 Inland Watercraft of North America

The most basic function of a boat is to transport people and goods on water. Westerdahl (1996) notes that vessels not only reflect their function, but also are adapted to fit the conditions of the route, or type of waterway in which they are used. In his work on transport zones Westerdahl (1998) identifies recurring features of river valley watercraft as being flat-bottomed, with masts well ahead of amidships which can be used for towing, a square sail, and often having an extended rudder projection. These recurring features are expected to be seen in vernacular gold rush watercraft as the largest portion of the journey to the gold fields consisted of river travel, with several stretches of rapids that either had to be negotiated, or portaged around. The second environmental water condition along the route consisted of several large, sometimes shallow lakes, many of which were surrounded by mountains and prone to katabatic winds and heavy squalls.

Howard Chapelle (1951) attempted to trace the history of American small craft back to its colonial beginnings. Chapelle classifies American flat-bottom watercraft in two types, the scow and the bateau, stating that they "were used wherever there was shoal-water navigation or a necessity for low-cost boats" (Chapelle 1951:45). The flat-bottomed scow and bateau-class boats have roots in Europe but were used extensively in inland waters in the United States and Canada during the last half of the 19th century (Chapelle 1951).

Pram-class boats refer to a broad range of flat-bottom, hard chine boats often used for carrying heavy loads in shallow inland waters. These workboats have long histories in Northern Europe where they were used to transport goods and materials along inland waterways, or lighter goods to deeper draught vessels at the coast (Neyland 1994). In North America, pram-class boats were referred to by several names such as scow, punt, flat, radeau, and gondalow, or gondolo; the latter often referring to a double ended, flat-bottomed, chine boat (Chapelle 1951). Scows and punts were common in North American inland waterways from colonial times onward. Both the scow and punt with their flat bottoms and sides are relatively easy to build and have good cargo capacity.

Pram-class boats typically have long steering oars but can be fixed with a mast and sail. A mast placed well forward can be used as a towing point either up river, or in times of little wind. It was not uncommon for North American punts and scows to have sides that raked at the bow and stern. This produces sheer at the gunwale and bottom camber, and may have been done to increase sailing performance (Chapelle 1951).

Bateau, literally “boat,” came to describe a general North American river craft with a flat-bottom and a raked bow and stern from the colonial era onwards. The bateau is thought to be the oldest form of Euro-American flat-bottomed watercraft in North America and the predecessor of the dory and river skiff (Chapelle 1951). The colonial bateau (Figure 3) is thought to have developed in the mid 1600s in French Canada along the St. Lawrence River, and have been built in lengths up to 45 feet (13.7 m). Bateaux are perhaps best known for their use in several wars including the French and Indian Wars, the American Revolution and the War of 1812 when the British Army had bateaux stationed at a number of their posts in Upper and Lower Canada (Chapelle 1951; Malcomson 2003). North American fur traders also used bateaux with a similar hull shape to that of the colonial bateaux (Chapelle 1951).

Chapelle (1951) separates the North American bateau type into two sub-classes; the first class includes the lumberman’s bateau and the fisherman’s dory, while the second class includes flat-bottom skiffs. The two classes of bateau represented two fundamentally different construction methods.

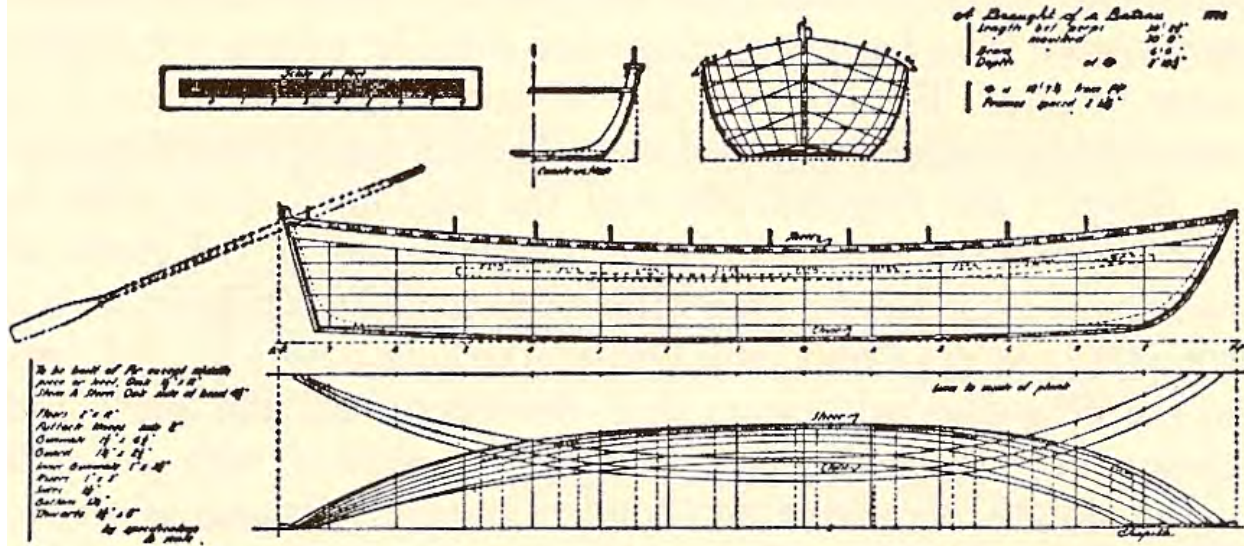


Figure 3. Design of colonial bateau, probably for use on Lake Champlain in Burgoyne's campaign of 1776, from the Admiralty draught. Chapelle 1951.

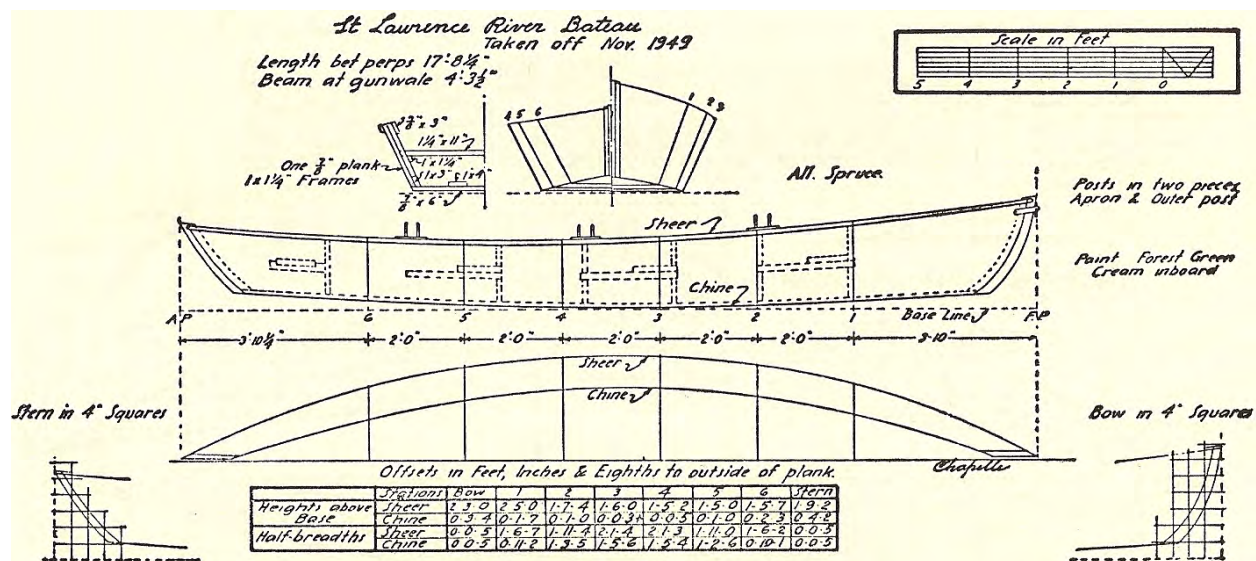


Figure 4. Type of small Double-ended Bateau used below Quebec on the St. Lawrence River. Chapelle 1951.

The lumberman's bateau and fisherman's dory were lapstrake construction built right side up. First the bottom was formed, next the frames were attached, and then the sides were planked. The bottom of the lumberman's bateau and fisherman's dory had longitudinal planking over the floor timbers, which are part of the side framing. Flat-bottom skiffs however, were typically built upside down with the sides sprung to shape over molds, then carvel planked. Last,

length, which ranged from 12-16 feet (3.66-4.88 m) (Chapelle 1951; Gardner 1978). However, dories came in various styles and in lengths longer than this. Dories could be round or straight sided, double-ended, or have a transom. The defining feature of a dory is the way in which it is built. Dory construction came from the availability of wide planks from the forests of the eastern United States. Dory construction starts with building the bottom with fore-and-aft planking that is then shaped. Next the frames, stem and transom are attached. Bottom rocker can be obtained by the use of shores or weights. Finally, the lapstrake planks are fit to the frames. (Gardner 1978).

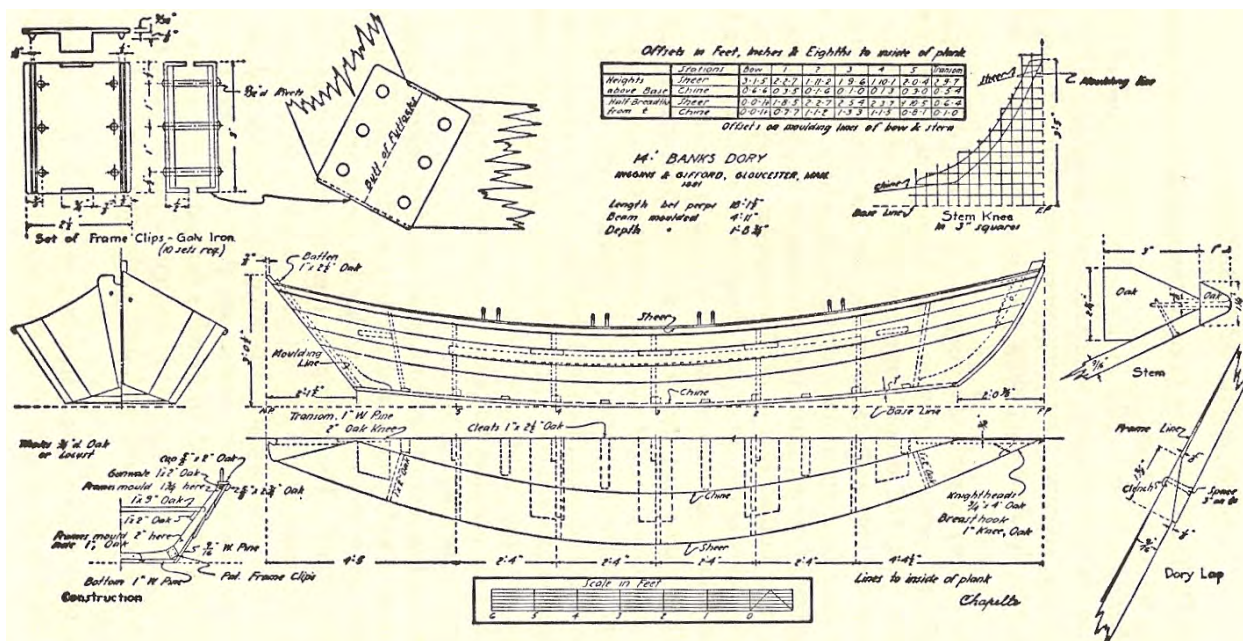


Fig 6. Drawing of an old “stock boat” banks dory of the style carried by Gloucestermen in the 1880s and 1890s. Chapelle 1951.

3.2 Overview of Klondike Gold Rush Studies

The Klondike Gold Rush has been the focus of many historical and archaeological investigations. Historical research of the Klondike Gold Rush has focused on such topics as the trail as a whole, or aspects such as gold rush food, transportation, the effects on the various indigenous tribes, and the role of women (e.g., Bennett 1978; Berton 1958, 1978, 2005; Mayer 1989; Morse 2003; Neufeld and Norris 1996; Thornton et al 2004). Archaeological investigations have included surveys along the Chilkoot Trail and Upper Yukon River, along with more in-depth investigations at settlements such as Dawson, Miles Canyon, and Skagway

(e.g., Archibald 1972; Hammer 1999; Spude 1993). While many of these studies make mention of life at Lakes Lindeman and Bennett and the boat building activity there, few delve beyond a paragraph or a page that simply states that boats were built and used.

One noteworthy historical work on the Klondike Gold Rush boats is David Neufeld's (1991) article, *Boating on the Chilkoot*. Neufeld presents an historical overview of the watercraft used along the Chilkoot Trail, which includes native craft, the Klondiker boats, and the commercial sternwheelers that sprung up in response to the gold rush. The article does not go beyond a brief summary of the history of boating on the Chilkoot Trail, nor does it include any archaeological findings. However, Neufeld provides a good summary of the watercraft on the Chilkoot Trail. His use of archival photographs illustrates his work, but no apparent attempt was made to study the photographs for construction techniques or to talk about the boat types within a larger social context or a land-based economic process.

Journalist and Canadian history author Pierre Berton has described the Klondikers' armada of over 8,000 boats as "the most bizarre fleet ever" (1958:277). Berton's assessment of Klondiker boat types as well as his account of the spring ice break-up and the fleet heading downriver reveals perhaps a more colorful scene than can be accounted for in the archaeological material, textual evidence and archival photographs. In addition to describing watercraft that would have been very out of place along the sub-arctic inland waterways, Berton creates a somewhat colorful picture of a mass exodus from lakes Lindeman and Bennett stating that:

Within forty-eight hours all the lakes were clear of ice and the whole freakish flotilla of 7,124 boats loaded with thirty million pounds of solid food was in motion...Off they sailed like miniature galleons, seeking the treasure that lay beyond the horizon's rim, the most bizarre fleet ever to navigate fresh water. Here were twenty-ton scows crammed with oxen, horses and dogs, one-man rafts made of three logs hastily bound together, light Peterborough canoes packed over the passes on men's shoulders, and strange oblong vessels that looked like and sometimes were-floating packing-boxes. Here were slim bateaux brought in sections from the Outside and canoes made from hollow logs with sticks for oarlocks and paddles hand-whittled from tree trunks. Here were skiffs and cockleshells, outriggers and junks, catamarans and kayaks, arks and skiffs, catboats and wherries. Here were boats with wedge bottoms, and boats with flat bottoms, and boats with curved bottoms; boats shaped like triangles and boats shaped like circles; boats that looked like coffins and boats that were coffins. Here were enormous rafts with hay and horses aboard, propelled by mighty sweeps; and here were others built from a single log with only a mackinaw coat for a sail. Here was a craft modeled after a Mississippi sidewheeler with two sidewheels operated by hand cranks, twisting and turning awkwardly in a zigzag movement down the lake. And here was a boat with two women who had sewed their

undergarments together and suspended them between a pair of oars to make a sail (1958:277).

This interpretation of the Klondiker boat types suggests that there was a high degree of variability and furthers propagates the idealized notion of “the individual” in the gold mining frontier, even when in the midst of 30,000 others who were participating in the same endeavor. Additionally, it suggests Klondiker origins as being more diverse than European and Euro-American; or at least that the origin of their boats were. While the Klondike Gold Rush was a multi-national event, there is little indication that the variability of the boat types represented vernacular watercraft from around the world.

3.3 Previous Archaeological Research of Klondike Gold Rush Inland Watercraft

In 1978 an underwater archaeological survey was undertaken by Parks Canada along the Chilkoot Trail and sections of the Upper Yukon River. Areas searched include the alpine lakes just east of Chilkoot Pass, as well as Lakes Lindeman and Bennett, and sites associated with the canyons and rapids along the Upper Yukon River. In total the area searched was over 114 miles (185 km) and aimed to investigate marine aspects of the Chilkoot Trail (Waddell 1979). The survey located lading and unlading areas along the chain of alpine lakes that were used by the Klondikers and associated with the ferry system that operated there. Knowledge of these places helped to reconstruct the original gold rush trail, which differed slightly from the Tlingit Trail in areas (Waddell 1979). Archaeological material underwater, or closely associated with the lakes, was recorded and largely left in situ. Most of the cultural material associated with boats was found at the alpine lakes, very little cultural material was found farther downstream. Waddell’s survey was one of many archaeological surveys conducted to determine what cultural material remains were present along the gold rush trail in advance of both Canada and the United States creating national parks that encompassed their respective stretches of the Chilkoot Trail. While the survey was successful in locating some boat remains, its intention was not aimed at defining or explaining the vernacular craft of the gold rush, rather only to report on their extant remains.

An archaeological survey of the Upper Yukon River was conducted by Norm Easton in 1986, and located the submerged remains of the dock and the tramway track at Canyon City, a gold rush portage town (Hammer 1999). Also located were the boat remains from two vessels suspected to be Klondiker watercraft on the shores of Lake Laberge. Unfortunately not much is

known about these vessels, only that one is a small flat bottomed, hard chine vessel with a flat transom and the other is a small lapstrake vessel (Easton 1986).

More recent archaeological investigations of gold rush boats have attempted to locate the sternwheelers that plied the river between Lake Bennett and Dawson. A current success was the recent locating of the A.J. Goddard. While finding the sternwheelers will be helpful in understanding commercial navigation along the lake and river system, it unfortunately bears little on this discussion of Klondiker boats. However, ongoing searches for sternwheelers may prove helpful in locating more gold rush vernacular watercraft.

3.4 Summary

Investigations of North American small craft, while incredibly important, unfortunately relies largely on watercraft used on the east side of the country, with a smattering of examples from the Great Lakes and the west coast. While many of these rather generic hull forms and boat types are seen on both sides of the country, a more thorough look at west coast variants is needed.

This chapter shows that while investigations into gold rush transportation have been undertaken, they have yielded little information with regards to Klondiker vernacular watercraft. Due to the lack of available archaeological finds it is necessary to look at other means of investigating the gold rush flotilla. Ongoing investigations into the commercial sternwheelers that plied the Upper Yukon River and Lake Bennett may prove useful in locating remains of boats that were part of the Klondiker flotilla. However, due to the general lack of knowledge about these boats, further finds might not be recognized for what they are. A better understanding of the small craft of the gold rush should help with the identification and analysis of any future finds.

IV

Methods and Theory

The methodology for this study included gathering information regarding the Klondiker boats from historical, archeological, and photographic sources. Though there is a dearth of boat remains amongst the archaeological material, there is a wealth of archival information, both in the written and photographic form. These three sources of information work well together to form a more complete picture of the small, inland watercraft.

4.1 Textual Evidence

The Klondike Gold Rush occurred in the era of the transcontinental telegraph, allowing for news from the Yukon to rapidly reach all around the world (Coates and Morrison 1988). There are numerous gold seeker narratives of the journey to the Klondike, from those who wrote for news organizations to those who sent letters home that eventually have been published or are now housed in archives. As with any personal account, one must scrutinize the accuracy of the reporter and be aware of misinformation or missing information. While some of the Klondiker narratives are embellished accounts of life along the gold rush trail, other informants give reliable information.

Edwin Tappan Adney traveled the Chilkoot Trail in 1897 employed as a journalist for Harper's Weekly and The London Chronicle. His book *The Klondike Stampede*, originally published in 1900, chronicles his journey to the Klondike. Not only was Adney a seasoned journalist, he had a keen understanding of, and fascination for, small watercraft. Eight years prior to Adney's Klondike journey, he began his study of Native American canoes that would continue until his death in 1950. Howard Chapelle compiled Adney's work of recording and building native canoes, and added information from his own studies of native watercraft, resulting in their co-authored publication, *The Bark Canoes and Skin Boats of North America*. Unfortunately, Adney did not spend more time in recording Klondiker watercraft; however the information he does provide about this topic is perhaps the most reliable of the available firsthand accounts. Other primary sources include the records of the NWMP, who had several outposts along the Chilkoot Trail. As part of their work, they registered boats at Lake Bennett and at their checkpoint at Lake Tagish. The NWMP recorded the names of the boat occupants and

designated a number for each boat as a safety precaution. They also included a rudimentary boat type as part of the registry. Their classification system is useful in designating vessels to a general class, but it is incomplete, as over 4,000 vessels were not given any distinction in type. Along with Adney's account and the NWMP records, there are numerous other first hand accounts that discuss boat dimensions, construction methods, commercial boat building, and boat usage along the trail.

4.2 Archaeological Evidence

Both land and underwater archaeological surveys along the Chilkoot Trail have shown that there extant gold rush era archaeological remains. The majority of the archaeological evidence presented here comes from the Parks Canada 1978 underwater diver survey. Additional material is presented from a 1986 underwater survey of the Yukon River, and from land surveys, completed in 1977 and in 1984. The shore-based surveys did not locate boats or boat parts, but did locate remains on shore that are, or could be associated with, boat activity. Greenhill (1976) notes that remains of flat bottom boats are less likely to be identified as such than round bottom boats, and are more likely to be torn apart and the timber reused for other purposes. The reuse of timber is one of several eventual outcomes of the gold seekers' boats. While the vast majority of boats ended up in Dawson or other areas north of the boatbuilding center, some vessel remains were located at the alpine lakes, Lake Lindeman and Lake Laberge.

In general, the gold rush trail through either Chilkoot or White Pass was a one-way route, with Klondikers traveling into the Yukon gold fields from the south. Some Klondikers did exit the Yukon by returning to Skagway or Dyea and then back to the contiguous United States from there. However, they often did not use their watercraft for upstream navigation. Instead they went by foot or by one of the sternwheelers that was then plying the Upper Yukon River. If more Klondiker boat remains are to be found, they will likely be closer to the Yukon gold fields than to Lakes Lindeman and Bennett.

4.3 Photographic Evidence

The use of iconographic data in boat studies is not new. Many studies of boats in other parts of the world have relied on images in rock carvings, tapestries, coins, town seals, and paintings to study various aspects of boat technology (e.g. Greenhill 1976; Johnston 1980; Lape et al 2007;

McGrail 2001). In this study, the archival photographs are presented as supplementary material to the archaeological record. The photographs have up until now not been used to directly make comment on the Klondiker boats types and features. Archival photographs have obvious limits in their ability to help determine specifics regarding boat types and construction methods. It is difficult to discern from the two-dimensional image such particulars as length or breadth. Additionally, many of the images show only the outside of a boat, with a limited view of the internal structures. Despite their limitations, the photographs depict boats that actually existed at one time and are useful in providing information that is not available in either the archaeological or historical record. Photographs can show more information than a drawing or rock carving and are not necessarily up to the interpretation of a third party. In addition, information such as sails and rigging that would rarely be found in the archaeological record and might not be discussed in the historical record can be gleaned from photographs.

There were several commercial photographers who made their way to the Yukon during the Klondike Gold Rush. Many of the professional photographers now have their collections housed in public archives. Additionally, many of the Klondikers carried cameras and documented their journeys. In the 1880s and 1890s the mass-produced, hand-held personal camera became available to the masses (Tagg 1993). Julius Price (1898:141) in his travel narrative of the gold rush, remarked on the popularity of the camera, saying “the ubiquitous photographer by the dozen of course, for where is he not in these last days of the nineteenth century? Oh, Kodak, Kodak, what have we done that even in these far-away Northern solitudes one cannot escape thy demon eye!”

To limit the photographic evidence, this thesis uses photographs that are available through the Yukon Archives, the University of Washington Special Collections. This study focuses on the gold rush trail through Chilkoot Pass. Therefore, only photographs depicting watercraft at the alpine lakes, the boat building centers, or areas en route to the gold fields have been used. Many photographs of Dawson depict small watercraft lining the river’s shore. These vessels were likely to have been built along the Chilkoot Trail, but it is also possible that they were built at other locals. In addition, it would be difficult to tell if a vessel from Lake Bennett is the same vessel that can be seen Dawson. For these reasons a full study of the archival photographs is not undertaken here. Instead, illustrative photographs were chosen for their ability to depict boat

types, construction methods, propulsion methods, or aid in deciphering the usage of watercraft both at the alpine lakes and the boat building centers.

4.4 The Klondike Gold Rush: A Cosmopolitan Mining Frontier

Fredrick Turner in his 1893 thesis, “The Significance of the Frontier in American History,” posited that the frontier played a significant role in American development and was a place where social development was constantly beginning over again at each new frontier settled (Turner 1958). Turner’s frontier was a “meeting point between savagery and civilization” and came to an end in the United States in 1890 when that year’s census revealed there were no more large tracts of land available for conquest (1958:3). Turner posited that European immigrants to America soon shed their Old World ways and were Americanized in the frontier lands, stating that the environment of the frontier was “at first too strong” for the new immigrant but “little by little he transforms the wilderness, but the outcome is not the old Europe” rather it “is a new product that is American” (Turner 1958:4).

Turner’s thesis has received criticism by historians for its lack of consideration of women, indigenous groups, and minority immigrant groups in the American frontier. Viewing Turner’s model of western expansion as nationalistic and ethnocentric “new western historians” have revised Turner’s model of western expansion, and expanded the concept of ‘frontier.’ Thompson and Lamar regard the American frontier as a “territory or zone of interpenetration between two previously distinct societies” (1981:7). Within their view, one of the societies is either indigenous, or has occupied the area for a very long time, while the other society is ‘intrusive’ (Thompson and Lamar 1981). Limerick argues that one of the definitions of ‘frontier’ is “the discovery of new resources and the rush of populations to exploit those resources, ” which she notes did not end in 1890 as Turner suggested (1991:83). Limerick rejects the old term ‘frontier’ as it is “nationalistic and often racist” and focuses on the process that involved “the convergence of diverse people...in [a] region, and their encounters with each other and with the natural environment” (1991:85, 86). Others have tried to classify frontiers based on factors of colonization and the binding links between the frontier and the parent culture.

Nugent (1991) classifies two types of frontiers. Type I frontiers became farming towns, filled with families who put down roots and stayed on the land. Type II frontiers included mining communities that were “notoriously unstable” and largely populated by transient young men

(Nugent 1991:174). Steffen (1980) also separates the American frontier experience into two categories, cosmopolitan and insular, and considers the cosmopolitan frontier as having lacked fundamental economic, political, and social change. He argues that the American placer mining frontier was a cosmopolitan frontier, heavily linked to the main body of American civilization by a dependence on goods and services (Steffen 1980). Strong links to the parent culture negated the need for fundamental change within the frontier. Conversely, limited interacting links with the parent culture produced an insular frontier, where the environment was a more significant factor in change (Steffen 1980).

The Klondike Gold Rush was a cosmopolitan frontier, heavily connected to the United States and Europe through transportation, communication, and economic systems. These strong transportation, communication, and economic links between the parent culture and the frontier form a world-system (e.g., Wallerstein 1976; 2004). Hardesty (1988) asserts that world-systems on the mining frontier included material, population, and information interactions. The networks for transporting materials to the mining frontier, as well as the materials themselves were tied to increased industrialization and capitalization. This can be seen in various aspects of the Klondike Gold Rush from the outfitters who supplied commodities to the transportation companies who supplied passenger and freight services. The population networks of the Klondike Gold Rush can be seen in the diverse ethnic groups who made up the mining population as well as the indigenous groups who inhabited the region and participated in various gold rush industries, particularly transportation and freight haulage. The information network of the Klondike Gold Rush can be seen in the rapid exchange of information that was made possible by the transcontinental telegraph system. Rapid communication helped to drive both people and capital from around the world to the Klondike gold fields.

Mining Rushes as Episodes of Colonization

Hardesty (1988; 2003) notes that mining rushes are episodes of colonization. He describes American mining colonies as islands surrounded by a social and cultural wilderness, where the colonizers imported their own social and cultural environment (Hardesty 1988). Cheney (1992) draws attention to the ephemeral nature of the mining frontier, noting that it was a place where tents served as houses and stores in the initial colonization period. Hardesty (1988) and Cheney

(1992) have used two similar models, the Swiss Family Robinson model and the Darwinian evolutionary approach, to understand adaptation and colonization in mining frontiers.

Birmingham and Jeans (1983) developed the Swiss Family Robinson model of colonization for application within Australian colonial settlement archaeology. Their model outlines three stages of adaptation and change in the colonization of Australia. The initial stage is a short-lived exploratory stage, followed by a longer stage involving learning through trial and error, and finally culminating in a development phase which sees successful methods implemented (Birmingham and Jeans 1983). Cheney (1992) applied the Swiss Family Robinson model to interpret the gold rush in Australia's state of Victoria. Cheney notes that in the first stage colonizers are dependent upon imports, and suggests that for the second stages to occur "migrants...must decide to become colonizers, the people that will build a new and permanent society" (1992:37). Cheney (1992) posits that mining frontiers had both an outward focus, with an awareness of the external factors important to the success of the mining venture and the need to continually move on in search of the next mineral rush, as well as an inward focus that manifested in a need to form a community, create ongoing relationships, and establish a sense of belonging.

Hardesty (1988; 2003) examined American mining frontiers through a Darwinian evolutionary approach that assumes that human behavior is expressed in the archaeological record. He borrowed from Kirch's (1980) model of island cultural adaptation that sees adaptation as the outcome of the operation of natural selection. Natural selection fashions traits of organisms, including behavior, that help organisms survive and reproduce (VanPool 2002). Hart and Terrell view culture as a process, where selection shapes behavior through learning and "an organism's response to its surroundings and life's demands are selectively reinforced as natural consequences of its dealings with the world and its other inhabitants" (2002:5).

Kirch's model has three predictable stages that Hardesty (1988) applies to the mining frontier. In the first "pre-adapted" stage colonists' behavior has a low variability and a poor fit the new problems they are faced with. This leads to the second stage where "coping" strategies are implemented to solve various problems faced by the colonists include experimentation and innovation, increasing behavioral variability and the "intensity of selection acting upon the system" (Hardesty 1988:112). In the final stage, colonists have "adapted" behavior where

unsuccessful solutions to the problems are not replicated. Behavioral variability is again low but fits better within the environment (Hardesty 1988).

Watercraft as a Unit of Analysis in the Cosmopolitan Mining Frontier

This thesis investigates aspects of adaptation in the itinerant camps of the Klondike Gold Rush mining frontier. The unit of analysis for this investigation is the watercraft used in the ferry system at the alpine lakes, and the vessels built to transport people and goods from the headwaters of the Yukon River to the gold fields. A three-stage adaptation approach is used to evaluate the vernacular watercraft of the Klondike Gold Rush. These stages are closely tied to the development of Lakes Lindeman and Bennett as boat building centers and the continued development of Bennett as a transportation center.

In the first stage of adaptation in the mining frontier, Cheney (1992) argues that colonizers are dependant upon imports and Hardesty (1988) posits that the colonists' behavior has a low variability and is a poor fit in the new environment. Gold seekers came "pre-adapted" with knowledge from the earlier explorers, through their published accounts of their travels through the Yukon along the waterways. Newspapers and magazines around the world promoted the Klondike Gold Rush. Reports on trail conditions, and necessary items to take to the Klondike abounded. Klondikers included in their outfits the necessary items to build a boat. Some even brought boats to the north. Outfitters and catalogs offered collapsible boats for sale, and magazines, such as *Recreation*, had advertisements for the collapsible "Klondike" canoe, which could be readily purchased by mail order. Klondiker narratives attest to presence of the knockdown boats and canoes that were taken north in the first year of the gold rush.

The second stage of adaptation in the mining frontier is a stage of trial and error in the Swiss Family Robinson model, and of "coping" strategies in the Darwinian evolutionary approach (Birmingham and Jeans 1983; Hardesty 1988). Once gold seekers reached the boat building centers, they had many examples of boat building. How did they choose the style and size of boat they would build? What influenced this decision? While most of the gold seekers would not have had experience in boat building, it is reasonable to assume that they were familiar with boats from wherever they had come from and would have some aesthetic sense of what a boat "should" look like. Paul's assessment of the mining frontier as "a curious blending

of the new and the familiar, of innovation and imitation” accurately describes this stage of colonization at the boat building centers (2001:7).

Cheney (1992) contends that for the second stage of colonization to occur, migrants had to decide to become permanent residents, and did so by establishing relationships with each other and forming communities that fostered a sense of belonging. Many of the gold seekers did not intend to stay in the north, but only to be there as long as it took to strike it rich. Cheney’s hypothesis regarding community building could also be described as a coping strategy. Coping strategies involved what Hardesty (1988) terms as opportunistic strategies that include partnerships, cooperatives, and sharing of tools and labor. These coping strategies are difficult to see in the archaeological record of the Klondike Gold Rush. However, the historical and photographic record illustrate that these types of opportunistic strategies were prevalent amongst gold seekers all along the trail, especially at the boat building centers, and continued on into the gold fields.

The third stage of development, the “adapted” stage, or the development stage where successful methods are implemented, is a stage of decreased variability and a better environmental fit. These stages of adaptation as seen through the vernacular watercraft were fairly rapid and happened both at the individual level and a societal level. Klondikers with little knowledge of boats or boat building quickly adapted to the new environment that they were in by building or buying flat-bottom watercraft. As a whole, they also adapted to the economic environment by increasing the proportion of scows to other types of watercraft between 1898-1900. The NWMP records report more variability in vessel type in 1898 than the following two years. While this might be attributed to the recording system of the NWMP, it is likely that this was indeed the case as news and stories of successful and unsuccessful trips down river would surely have trickled back into the camps at the boat building centers.

The Klondike Gold Rush can be seen as a cosmopolitan mining frontier with strong transportation, communication, and economic ties to European and American cultures. The gold seekers brought with them most of the items that they required, including some small watercraft. However, these “pre-adapted” small craft were discarded in favor of adapted boat-types that were influenced by the physical and economic environment. Coping strategies saw many gold seekers bind together in their boat building endeavors. Boat building knowledge was transferred at the boat building centers between those who knew how to build boats, or those who had

already built a boat, to newcomers. The behavioral variants are expressed in the vernacular watercraft and can be seen in the historical, archaeological, and photographic records.

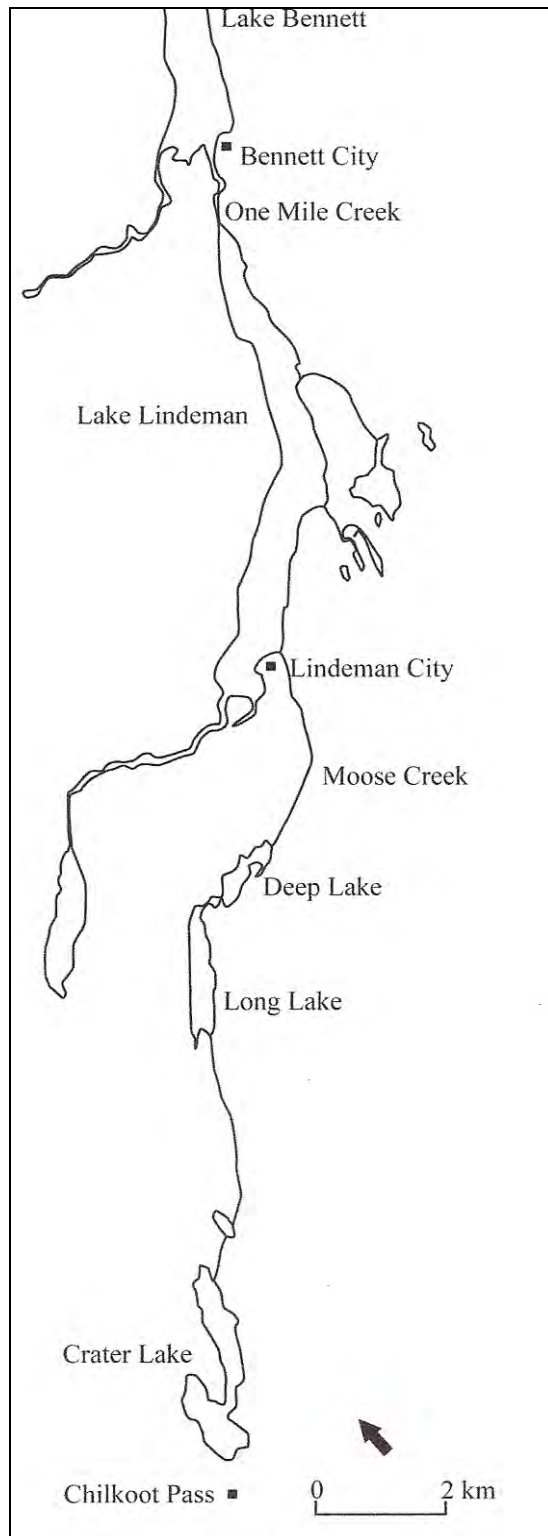


Figure 7. Map of the Chilkoot Trail from Chilkoot Pass to Lake Bennett. After Waddell 1979.

V

Textual Evidence

There are numerous narratives in the form of letters, diaries, and published travel accounts from those who traveled the Chilkoot and White Pass trails during the Klondike Gold Rush. While some of the narratives are clearly embellished, many contain information regarding the Klondiker vernacular watercraft that is useful to this study. In addition to the Klondiker narratives, the NWMP vessel registry is also presented here to help investigate gold rush boat types. Klondiker narratives give vessel dimensions in feet and inches. The approximate metric measurements, rounded to the nearest centimeter, are placed in parenthesis next to the original unit of measurement.

Historical evidence, as with the two following sections on previous archaeological surveys and archival photographs, are presented here following the gold rush trail from south to north. The first section presented in this chapter includes the area from the start of the trail at Dyea, to the summit of the Chilkoot Pass. This can essentially be viewed as one long and arduous portage, often taking gold seekers several months to carry their belongings in stages up to the pass. This section also includes the ferry system at the three alpine lakes, Crater Lake, Long Lake and Deep Lake. Klondikers arriving at the lakes during the winter months could walk across the ice, carrying their goods on sleds. Those arriving during the summer months could hire a ferry to transport their outfits across the lakes.

The second section includes the boatbuilding centers at Lakes Lindeman and Bennett. These lakes were the first areas east of the Chilkoot Pass to provide trees large enough for boat building. As a result their shores became the site of large itinerant tent cities. Lake Bennett was the terminus for both the Chilkoot and White Pass Trail and was the larger and longer lasting of the two settlements.

5.1 Tidewater to Summit and the Ferry System

Many Klondikers purchased canoes and knockdown boats prior to arriving in Alaska with the intent of transporting them along the Chilkoot Trail and using them to reach the gold fields near Dawson. The Chicago Record (1897) advised those headed to the Yukon to take a knockdown

boat with them to save time in building one. E. Hazzard Wells described the variety of watercraft being transported to Skagway and Dyea:

The Rosalie carries a varied and somewhat remarkable cargo. In addition to sacked provisions of all kinds, the miners have Klondike wagons, sleds, sectional boats and many other contrivances intended to lesson the time and labor usually consumed in getting to the mines. One man expects to load his 40-pound [18.1 kg] canvas canoe with 1400 pounds [635 kg] of outfit and go skimming away down the Yukon with no trouble to perplex. I warned him that rocky shoals lie all along the route and now he is uneasy. The sectional boats lie stacked in piles upon the upper deck. Some are 16-24 feet [4.88-7.32 m] in length, while others are not over 14 feet [4.27 m]. All are built on a broad scale so as to permit the carrying of heavy cargoes (1984:14).

Wells also noted that many of the Klondikers who had brought their own small craft ended up changing their minds with regards to using them:

Hundreds of ready-made take-down boats, in six- and eight-foot [1.83-2.44 m] lengths, have been brought to Alaska by the Klondikers who expect to be able to portage them to the Yukon. These boats cost from \$45 to \$100 each, including freight, and all are being dropped and deserted along the trail (1984:32).

Tappan Adney reported in 1897 that “knock-down boats of every conceivable sort are being taken up since the reports have come down that boat timber is very scarce, as well as high in price,” however, he confirmed “hundreds of boats...are being left behind” due to the difficulty of getting them over the Chilkoot and White Pass (1994:15, 16).

The Alpine Lakes

During the summer months, Klondikers could hire ferryman to freight their outfits across the alpine lakes. When Adney made the journey in September 1897, he noted that at the lading area of Crater Lake “some persons have tried to set up tents in this forbidding place...they belong to the boatmen, of whom there are three, ferrying goods to the foot of the lake at 1 cent a pound [.45 kg]” (1994:115). Adney and his companion paid for their outfits to be ferried across the lake, while they walked around to the unlading area. From Crater Lake the trail continues for 2 miles (3.2 km) to Long Lake.

Adney reported fifty tents at the southern end of Long Lake, although it seems that many of the tents belonged to people passing through. He hired the ferryman’s double-ended, square-rigged boat, at a price of 1 cent per pound (.45 kg), to ferry his goods across the lake, then

portaged his goods “a few hundred yards to Deep Lake” where another ferryman took Adney, his companion, and their outfits to a campsite at the northern end of Deep lake (Adney 1994:119). Everett Barton and three partners reached Crater Lake in early September 1897. In late September they purchased a lapstrake boat for \$200. The boat was built at Lake Lindeman “by a Sweede [sic] an old boat builder...[and was] a Sweedish [sic] pattern” (Barton 1897). The boat was a 24 feet long (7.32 m), with a 7-foot (2.13 m) beam at the gunwales and bottom width of 3 1/2 feet (1.07 m) (Barton 1897). Barton and his party intended to stay at the alpine lakes for a short time working as ferrymen. They operated their ferry at Long Lake and Deep Lake for just over two weeks then portaged their boat to Lake Lindeman when the alpine lakes began to freeze over. At Lake Lindeman the group made some repairs to their boat before setting off for Dawson (Barton 1897).

Robert Bolan and his four traveling companions also traveled the Chilkoot Trail in early September 1897. It appears that Bolan and his party hired one of the ferryboats as Bolan states that he and three of the men walked around Crater Lake while one of the party rowed one of the boats. They had to pay 2 1/2 cents per pound (.45 kg) to ferry their outfits across the alpine lakes (Bolan 1897). This was the same month that Adney passed through and paid 1 cent per pound. By May of 1898 the price of freighting between Chilkoot Summit and Lake Lindeman had gone up to 7 cents per pound (Healy 1898).

5.2 Boatbuilding Centers

When Tappan Adney arrived at Lake Lindeman in September of 1897 he saw “a hundred and twenty tents at the lake, half that number of boats in process of building, half a dozen saw pits at work, and a general air of hustle-bustle” (1994:119). Adney bought his boat lumber in Victoria, Canada and was one of a few who transported their own lumber to Lakes Lindeman and Bennett. He found it very difficult to hire a packer willing to carry the lumber over Chilkoot Pass. Adney built a lumberman’s bateau; “cut out from [his] own plans” whose overall length was 23 feet (7.01 m), and bottom length of 13 1/2 feet (4.12 m), with a 6-foot (1.83 m) beam at the gunwale, and bottom width of 2 1/2 feet (76 cm). The bottom was built with 3/4-inch (2 cm) cedar planking, while the sides were planked with both 5/8-inch (1.6 cm) and 1/2-inch (1.3 cm) cedar. He decided that his boat was the ideal type for rough water as it had flaring sides to prevent

waves from coming in while having a narrow bottom to make it through narrow channels and being easily handled by oar, paddle or pole (Adney 1994).

Unlike Adney, most Klondikers built their boats from green timber cut from the boreal forest. Local evergreen timbers include black and white spruce as well as lodgepole pine. Adney states that the boards being cut at whipsaw pits as being “small, rarely more than nine or ten inches [23-25.4 cm] in width...[and] an inch [2.54 cm] thick” (Adney 1994:120). But building with green timber resulted in substantial shrinkage, and “the boats as a rule leak[ed] like sieves” (Adney 1994:121).

Adney (1994) described the boats being built at Lake Lindeman in 1897 as large bateaux, skiffs and scows that carried five to ten men each. He states that “the favorite and typical boat [was] a great flat-bottomed skiff, holding two or three tons [1814-2722 kg]” with somewhat flaring sides and a wide, square stern, that averaged between 22 and 25 feet (6.71-7.62 m) in length, with some as large as 35 feet (10.67 m), and typically having a 6 or 7 foot (1.83-2.13 m) beam (Adney 1994:120). Adney also saw several “huge scows” being built, although he does not give dimensions, but notes that they had “a stout mast” well forward and were rigged with square and sprit sails made from canvas tarpaulin (1994:20).

Timber sources for boat building were being quickly depleted even as early as the fall of 1897. By 1898 it was difficult to find trees that produced boards wider than 6 inches (15.2 cm) at Lake Bennett (Stanley 1898:34). Klondiker Leo Healy (1898) noted that timber for boat building was scarce at Lake Lindeman by April of 1898 and farther downstream the large sawmills had already bought out all of the lumber. As more Klondikers made their way to the boat building centers they had to go several miles in any direction to procure boat building timber and either raft the logs back to their camp or else whipsaw the logs where they felled the trees and carry the boards back to their campsites. Sawmills operated at Lakes Lindeman and Bennett, however many Klondikers constructed whipsaw pits to cut dimensional lumber for boats. Whipsaw pits, the bane of the Klondiker, were constructed out of poles set into the ground and were tall enough to enable one man to stand underneath and work a saw back-and-forth through a log with another man standing on top. Whipsawing, especially for the novice, was trying work and difficult to achieve an even plank thickness.

William Shape made the journey over Chilkoot Pass in April of 1898. He and his companion ended up hauling their outfits three miles past Bennett City where “good timber for

boatbuilding was close at hand” (Shape 1998:47). Shape recounted his experience using a whipsaw pit in a letter home:

Enough logs were procured to erect a sawpit, 7 ft. [2.13 m] high, upon which the heavy logs must be rolled for the purpose of sawing out the boards and ribs for the boat. The logs were rolled up on skids, by means of a rope – then squared, and one inch [2.54 cm] boards marked out with a chalk line, on both sides of the log. We used a 6 ft. [1.83 m] saw – one man standing on the log above and the other on the ground, working the saw together. It was no easy job for inexperienced hands to keep the saw straight on the line and if once you run off, it is difficult to work the saw back again (1998:49).

Shape’s flat-bottomed boat had a “pointed bow and square stern” and measured 22 feet long (6.71 m) with a 5 1/2 foot (1.68 m) beam, and a 6-inch (15.2 cm) keel (Shape 1998:52). Shape’s boat was fitted with a mast and sail. He sewed together canvas sacks to make an 8 x 10 foot (2.44 x 3.05 m) sail. He also made a rudder, three sets of oars, and two sweep oars out of local timber (Shape 1998:52).

Healy’s experience whipsawing was also very difficult. He and his party were able to whipsaw 30-50 feet (9.15-15.24 m) of lumber each day. Their first attempt at whipsawing produced a 30-foot (9.15 m) board that was 2 inches (5 cm) thick for the first 3 feet (92 cm), 1 inch (2.54 cm) thick at 10 feet (3.05 m), 3 inches (7.6 cm) thick at 20 feet (6.10 m) and 1 foot (30.05 cm) thick by the time they reached the end. Healy and his party managed to rip 350 feet (107 m) of lumber to build a boat that was 25 feet (7.62 m) long, with a 6 foot (1.83 m) beam at the gunwale and 4 feet (1.22 m) across the bottom and could hold 3 ton (2722 kg) (Healy 1898).

The gold rush tent cities at Lake Lindeman and Lake Bennett were wholly consumed with boat building. In May of 1898 the NWMP counted 1,826 boats being constructed at Lake Lindeman, Lake Bennett, and Carcross. An estimated additional 1,200 boats were built in the ensuing three weeks (Neufeld and Norris 1996). Archival photographs and historical texts indicate that any relatively flat shoreline was completely taken up by Klondikers tents and boats. Flora Shaw wrote the following description of Lake Lindeman and Lake Bennett for the London Times in May 1898:

Between the two lakes and near the head of Bennett in particular was a considerable area of comparatively level land, and here, whichever way one looked, one saw a dense mass of white tents. The canvas city of Bennett contains a population of fully 5,000, and there are other large camps at the head of Lindeman, in one direction, and as many points down the lakes, towards Dawson, in the other...the whole population is under canvas. The majority of tents are formed into boatbuilding camps. But there is at least one business “street”

known as Main-street. This is situated along the shore of the lake and extends for a distance of about half a mile (as cited in Mayer, 1989:172).

Images of both tent cities show a somewhat haphazard layout of tents with boats consuming usable land not already taken by a tent platform. When Julius Price arrived at the lakes in 1898 he described the following scene:

All along the shore and to some distance up the hills, boat-building was being carried on with quite feverish activity, and the sound of the steam saw-mill, whipsaws and hammering and planning, resounded on all sides. Boats there were in all imaginable shapes and sizes, from big unwieldy barges to tiny craft that reminded one of the paper boat dear to childhood. It was, indeed, a wonderful sight. Many of the boats were being constructed with great skill, and were evidently the production of practical boat-builders, whilst others were little better than flat open boxes fitted with thwarts and thole pins. There was a remarkable resemblance between the boats, as though they were mostly built on one stock pattern. Curiously enough, not a single one had a rudder, nor do I remember seeing one anywhere on the journey (1898:108).

When Alfred McMichael camped at Lake Bennett and built his boat in May of 1898, he noted that many people were building scows. McMichael was proud of his boat, especially considering that he had no practical experience with wood working tools or boat building, but managed to build a boat of his own design that was 23 feet 7 inches (7.19 m) in length, with a 5 1/2 foot (1.68 m) beam (Reinicker 1984).

Another novice boat builder, Bruno Graf, “found that it was not so easy to make a boat” (Graf 1898). Graf and his party whipsawed their own lumber and built two skiffs, one larger than the other. He explains in his diary the steps that they took in building the boat:

It is quite a job to make a boat right. First you want to find the size, length, width and depth. Then you make the sides [frames?] set them in place and then you put the sides and bottom on. This takes nearly a week. Everything has to be just so or the shape will be lost and the boat will not go straight...It is different than house building. Every joint is a miter and it keeps you guessing how to cut (Graf 1898).

Graf's large skiff used 400 feet (122 m) of lumber. Its overall length was 23 feet (7.01 m) with a bottom length of 16 feet (4.88 m), and a 6 1/2 foot (1.98 m) beam at the gunwale. Graf's description indicates that the boat was a wide stern skiff as the widest section across the bottom was 5 feet (1.52 m), while the bottom at the stern was 4 feet (1.22 m), and the bottom at the bow was 1 1/2 feet (45.7 cm). Graf's smaller vessel was 16 feet (4.88 m) overall length, 15 feet (4.57

m) long on the bottom, with a 4 foot (1.22 m) beam at the gunwale and 3 feet (92 cm) wide across the bottom (Graf 1898).

Commercial boatbuilding at the lakes

There were several options for gold seekers if they chose not to build their own boat. Saw mills operated on Lakes Lindeman, Bennett, Nares, Tagish and Marsh. Several of the sawmills are known to have built boats that Klondikers could purchase. Geologist Josiah Spurr (1900) noted that a small sawmill had been taken over Chilkoot Pass and set up at Lake Bennett as early as 1896. He purchased an 18-foot (5.49 m) dory, “sharp at both ends, made of spruce, lap-streaked...with seams caulked and pitched” at Lake Bennett (Spurr 1900:65).

Wells (1984) attributes the first sawmill at Bennett to Rudolph, Marcus and Rocco who had brought a two-horsepower engine and boiler over the Chilkoot Pass in 1896. By August of 1897 Rudolph, Marcus and Rocco built and sold four sizes of skiffs and boats that were “crude but strong” lapstrake vessels made from green spruce lumber planks that were 1/2-inch (1.3 cm) thick (Wells 1984:44). The smallest boat was able to carry 1500 pounds (680 kg) and sold for \$75, the slightly larger skiff could carry 2500 pounds (1134 kg) and sold for \$90, the two-ton (1814 kg) skiff sold for \$150, and the three-ton (2722 kg) skiff sold for \$300 (Wells 1984:44). Wells states that the vessels had “sharp-pointed bows and wide sterns on flat bottoms” and were all “caulked with oakum and heavily pitched” (1984:44, 45). Rudolph, Marcus and Rocco built on average three boats per day by employing a number of men to build the boats, paying them \$15 per day plus board (Wells 1984).

Another sawmill and boatyard operating at Lake Bennett was King’s Mill, which initially operated at Bennett City but eventually moved north to Carcross. King’s Mill is known to have built dories and scows. Martha Louise Black and her five companions purchased a “fisherman’s dory... 37 feet [11.28 m] long, 6 1/2 feet [1.98 m] across the bottom and 8 1/2 feet [2.59 m] at the top” for \$275 from King’s sawmill in July of 1898 (Black 1976:34).

After the completion of the White Pass railway, the town of Bennett boomed as a freight depot where private boat builders and at least four sawmills were busy building scows (Nuefeld and Norris 1996). Arthur Waldon (1928) recounts from his trip over the White Pass in 1899 that one of the Lake Bennett sawmills was manufacturing scows that were 42 feet (12.80 m) long and 12 feet (3.66 m) wide, capable of carrying 20 tons (18,144 kg) and drew 24-26 inches (61-66

cm). The scows were constructed from 2 inch (5 cm) thick planking, with a fore and aft deck and narrow side decks.

Other smaller boat building businesses were also supplying gold seekers with boats. Wells noted that in August of 1897, “a person with the proper tools and a supply of nails, pitch and oakum can clear \$50 per day...building skiffs” (1984:49). He knew of at least three men at Lake Bennett who were building boats for others in 1897. In September 1897, Robert Bolan reported that boats were being sold at Lake Bennett for as much as \$475 apiece, but that a Frenchman was building and selling boats for \$250 if the purchaser supplied nails and oakum, and caulked the boat themselves (Bolan 1897). That same year William Loerpabel and his party hired a boat builder at Lake Bennett for \$10 per day plus board to help them build two boats that could carry 3 tons (2722 kg) each (Loerpabel 1897).

In April of 1898 carpenter William Patterson met two men at Dyea and together they planned to build boats commercially at Lake Lindeman. The three men then struck a deal with a fourth man in Dyea who offered the use of his horses for freighting in exchange for help in building a boat once they all reached the lakes (Patterson 1898). When the party reached Lake Lindeman they began a freight hauling business to Bennett. They hired boats for \$2.50 per day and carried freight at \$10 per ton (907 kg) and passengers at \$1 apiece. Two commercial steamers were already working on Lake Bennett by June 1898, but the men had plenty of business. They also helped build a scow for \$7 each per day before beginning work on their own vessel. Patterson’s boat was 25 feet (7.62 m) long, with a 7-foot (2.13 m) beam, 34 inches (86 cm) deep and could carry 3 tons (2722 kg) (Patterson 1898).

Boatbuilding Cooperatives at the Lakes

A second option for gold seekers not wanting to build their own boat was to join in on a boat building cooperative by exchanging goods, labor, or both for a seat in the boat. The NWMP required each person entering the Yukon to have at least a one-year supply of food, which Berton (1978) estimates to be roughly 1,150 pounds (521 kg) of food. This weight considers only the food and not the other necessary items, such as a stove, tools for boat building and mining, a tent and sleeping bag or blankets and warm clothing. To go by oneself meant that a person had to carry an entire outfit by themselves or hire a packer over the Chilkoot Trail. To go as a group meant that the weight of various necessities such as, tent and stove could be shared amongst the

group. Similarly with boat building, those who were part of larger groups could share both resources and labor.

A group of sixteen men who had formed the “Monitor Gold Mining and Trading Company” under the leadership of Lars Gunderson, a Norwegian immigrant to America, left Minneapolis for the Klondike in January 1898. The party was comprised of Norwegian immigrants who obtained their membership by signing a contract to stay with the company until September 1, 1899 and paid \$500 in cash for company shares (Lokke 1965). During the time with the company, each member was expected to devote their full attention to the running of the company by working for wages when needed and prospecting when possible. The profits from the venture were to be split amongst the men who undertook the journey and other stockholders, with the sixteen men who went to the Klondike splitting fifty percent of the profits, and the other stockholders splitting the remaining fifty percent (Lokke 1965).

The party arrived at Lake Bennett in April of 1898, where they proceeded to build three scows in a matter of weeks; the first scow was completed in one week and the other two each took four days to build. The scows were 28 feet (8.53 m) long, 8 1/2 feet (2.59 m) wide and 3 feet (92 cm) deep. In addition to the three scows that would carry the men and their outfits, the group built two smaller boats for scouting in shallow water. The two smaller boats were 15 feet (4.57 m) long, 4 1/2 feet (1.37 m) wide and 18 inches (45.7 cm) deep. Gunderson decided to also build a canvas boat that was 15 feet (4.57 m) long, 4 feet 2 inches (1.27 m) wide and 20 inches (51 cm) deep (Lokke 1965:78). When the boats were finished, they were painted and Gunderson noted that “all of [the] boats without exception are the best in every respect of all the boats built on [the] lakes” (as cited in Lokke, 1965:79). The scows were named Monitor 1, Monitor 2, and Monitor 3, and the two small wooden boats were christened Viking and Minnie (after their American hometown of Minneapolis, Minnesota), while the canvas boat was dubbed Minnehaha (Lokke 1965). The three scows and the canvas boat all had sails. There is no mention of sails for the two small wooden boats, and no further details regarding their type or construction. The three scows each took a smaller boat in tow (Lokke 1965).

There was likely extensive trade and bartering that occurred along the trail and especially at the boat building centers. Nails, pitch and oakum were in high demand and Adney (1994) remarks that in 1897 nails were one dollar or more per pound (.45 kg), and that he saw one man pay fifteen dollars for two pounds (.9 kg) of pitch to seal the seams of his boat. Klondikers who

did not have enough money to purchase a boat from one of the sawmills at the lakes, and who did not want to whipsaw their own lumber could cut timber for the mills from the nearby forest. Wells (1984) notes that Rudolph, Marcus and Rocco would mill Klondikers' logs, retaining 75% of the boards for their own use, leaving the Klondikers the remaining 25% to build their own boat with.

Wells wanted to buy a boat from Rudolph, Marcus and Rocco, but by the time he reached Lake Bennett, they were not taking any more boat orders as they already had too many to fill before winter came. However, the mill ran out of nails and pitch by the end of August 1897 and told Wells that they would build him a boat immediately if he could supply them with nails and pitch. This set off a string of bartering whereby Wells was "loaned" 10 pounds (4.5 kg) of pitch at a rate of \$5 and the promise that he would return 10 pounds of pitch to the man in coming days. Wells then traded 8 pounds (3.6 kg) of bacon from his outfit for 4 pounds (1.8 kg) of six-and-eight-penny wire nails. He then paid \$90 and traded the pitch and nails to Rudolph, Marcus and Rocco in return for a 26 foot (7.92 m) skiff (Wells 1984:53-55).

Men could build their own boats either whipsawing their own lumber or by exchanging labor in return for sawn lumber. Single women traveling to the Klondike had slightly different options for securing a place in a boat headed to the gold fields. Women bartered goods and services in exchange for joining in boat building or boat purchasing cooperatives. Belinda Mulrooney, who along with her party of four men, three children and one other woman, joined forces with at least nine others at Bennett in April 1897. Together they built several boats, each person supplying materials and resources to build the boats based on the amount of freight that they had. Belinda states that she "had materials for boat building, and that stuff they pack boats with, oakum. All [she] had to do was exchange that for labor" (as cited in Mayer and DeArmond, 2000:52).

Table 1 gives the vessel type and dimensions from the Klondiker narratives. Most Klondikers gave an overall length (LOA) and overall beam (BOA), while a few provided the bottom length of their vessels (LOB) and the beam at the chine (BAC). There are twelve vessels that can be classified as bateau-class, or likely to be bateau-class. These twelve vessels range in overall length from 15-37 ft (4.57-11.28 m) with a median overall length of 23 ft (7.01 m). Ten of these vessels also have a measurement for the overall beam, which ranges from 4-8 1/2 ft (1.22-2.59 m) with a median overall beam of 6 ft (1.83 m). These length and beam dimensions

correspond with Adney's (1994) report that boats built at Lake Lindeman in 1897 averaged between 22-25 ft (6.7-7.6 m) in length and between 6-7 ft (1.8-2.1 m) in breadth. Figure 8 illustrates the overall length for these twelve vessels.

Table 1. Vessel type and dimensions from Klondiker narratives.

Year	Party and #	Vessel Type	Construction	LOA	LOB	BOA	BAC
1897	Spurr 1	Dory	Lapstrake	18 ft (5.49 m)	?	?	?
1897	Adney 2	Lumberman's Bateau	Lapstrake?	23 ft (7.01 m)	13 1/2 ft (4.12 m)	6 ft (1.83 m)	2 ft 6 in (76 cm)
1897	Barton 3	Swedish design	Lapstrake	24 ft (7.32 m)	?	7 ft (2.13 m)	3 ft 6 in (1.07 m)
1897	Wells 4	Wide-stern skiff	Lapstrake	26 ft (7.92 m)	?	?	?
1898	Black 5	Dory	Lapstrake?	37 ft (11.28 m)	?	8 ft 6 in (2.59 m)	6 ft 6 in (1.98 m)
1898	Gunderson 6 & 7	Small boats (x2)	?	15 ft (4.57 m)	?	4 ft 6 in (1.37 m)	?
1898	Gunderson	Canvas boat	Skin on frame	15 ft (4.57 m)	?	4 ft 2 in (1.27 m)	?
1898	Graf 8	Small Skiff	?	16 ft (4.88 m)	15 ft (4.57 m)	4 ft (1.22 m)	3 ft (92 cm)
1898	Shape 9	Wide-stern skiff	Carvel	22 ft (6.71 m)	?	5 ft 6 in (1.68 m)	?
1898	Graf 10	Wide-stern Skiff	?	23 ft (7.01 m)	16 ft (4.88 m)	6 ft 6 in (1.98 m)	5 ft (1.52 m)
1898	Healy 11	?	?	25 ft (7.62 m)	?	6 ft (1.83 m)	4 ft (1.22 m)
1898	Patterson 12	?	?	25 ft (7.62 m)	?	7 ft (2.13 m)	?
1898	Gunderson	Scow (x3)	Carvel	28 ft (8.53 m)	?	8 ft 6 in (2.59 m)	?
1899	Sawmill	Scow(s)	Carvel	42 ft (12.80 m)	?	12 ft (3.66 m)	?

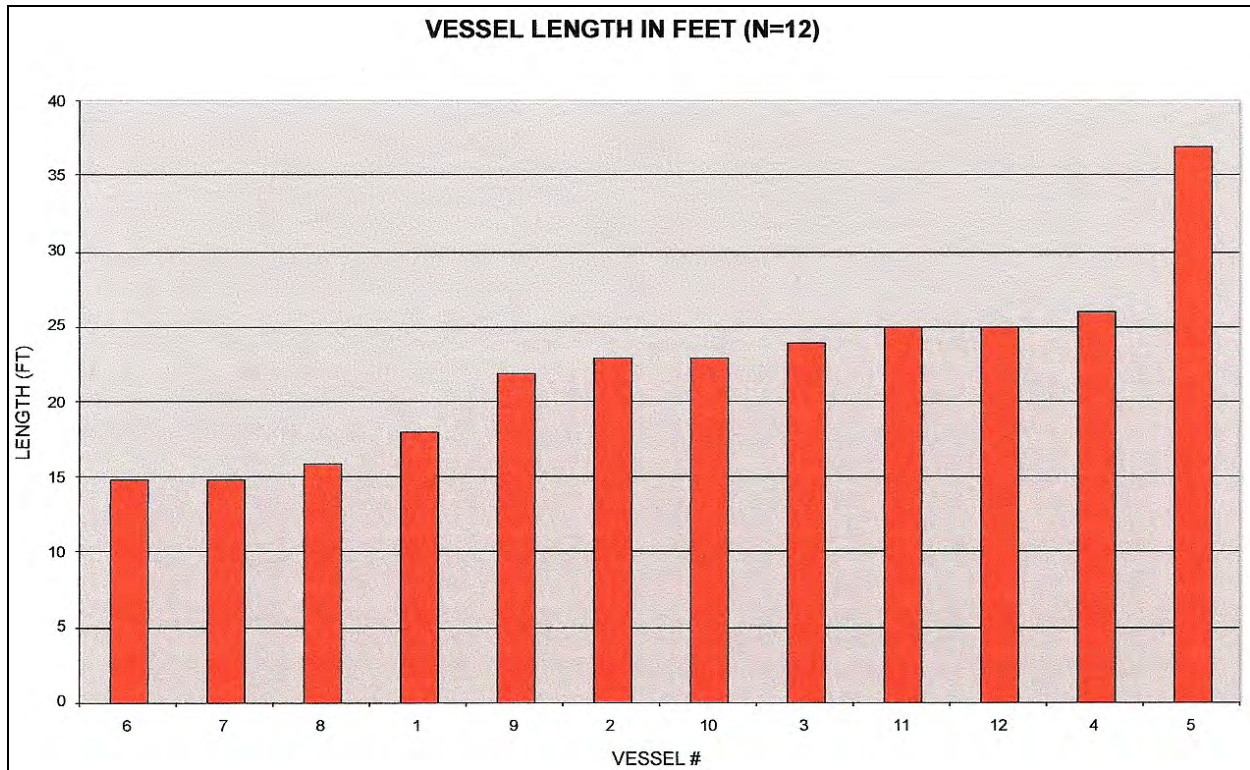


Figure 8. Vessel lengths in feet from Klondiker narratives.

5.3 The North West Mounted Police Records

The NWMP formed in 1873 and were responsible for custom's collection and judicial duties in Canada's newly acquired western territories (Dobrowolsky 1995). By 1892 the Canadian government had received requests from both the Anglican Church and the North American Trading and Transportation Company, for police presence in the Yukon Territory to quell the growing liquor trade. In 1894 Inspector Charles Constantine and his Staff Sergeant hiked the Chilkoot Trail, hiring two miners to help them build a boat at Lake Bennett. They made their way to Forty Mile, on the Yukon River, and determined that the Yukon Territory was in need of a police force. The following year twenty police were sent to the Yukon gold fields (Dobrowolsky 1995). When the stampede to the Yukon began the NWMP began establishing customs collection stations along the various routes to the Klondike, with posts at Lakes Bennett and Tagish established in 1897, and at Lake Lindeman in 1898.

From May 28 until October 22, 1898 the customs posts at Tagish and Bennett were responsible for registering vessels and recording the names of every person entering the Yukon. Vessels registered at Bennett City in 1898 were numbered 1 through 2,344, while vessels

registered that same year at Tagish were numbered 10,000 through 14,736. In 1898, the NWMP registered approximately 28,000 people entering the Yukon, averaging four people to each boat (Strickland 1899). The Bennett post recorded some vessels but did not give them a registration number. Boats that were recorded but not registered were traveling with other boats and were usually labeled as “skiff” or “tender.” The total number of boats registered in 1898 was 7,080. The total number of vessels recorded at Bennett that year was 2,578, while the total number registered there was 2,344. The Bennett registry for 1898 included vessel type (see Figure 9). The Tagish registry for 1898 did not include vessel type and does not include any vessels that were not given a number. It is unknown if there were additional vessels that passed through Tagish which were part of a fleet and not given a designated registry number.

In 1899 and 1900 all people and vessels entering the Yukon Territory were registered at Tagish. In both of these years there are additional vessels recorded but not registered with a number. In 1899 885 vessels were registered but 929 vessels were noted. In 1900, the vessel registry numbers to 692, however there are no vessels numbered between 558 and 567. This could likely be a clerical error as there are also no names associated with the missing numbers. If this were the case, then the actual number of registered vessels would be 682, while the recorded vessels total 688.

Figure 9 shows the registered vessels between 1898-1900 from the NWMP records. It does not include the 4,736 vessels that were registered at the Tagish post in 1898 whose vessel type was not noted. From the NWMP boat registry we can see that the broadest emic classification was in 1898, where fourteen different categories of watercraft were recorded. However, these categories are not mutually exclusive. For example, the NWMP differentiate between “canoes,” “canvas canoes,” and “P. canoes.” It is likely that “P. canoe” refers to the Peterborough canoe, a Canadian canoe manufacturer that offered 120 different models for sale in 1892 (Peterborough Museum and Archives 2009). Whatever the make or manufacturer of the various canoes, all three categories can be classified broadly as canoe, with a total of 94 canoes registered in 1898. Similarly, “scow,” “punt,” and “barge” can be classified as pram-class vessels and total 534 in 1898.

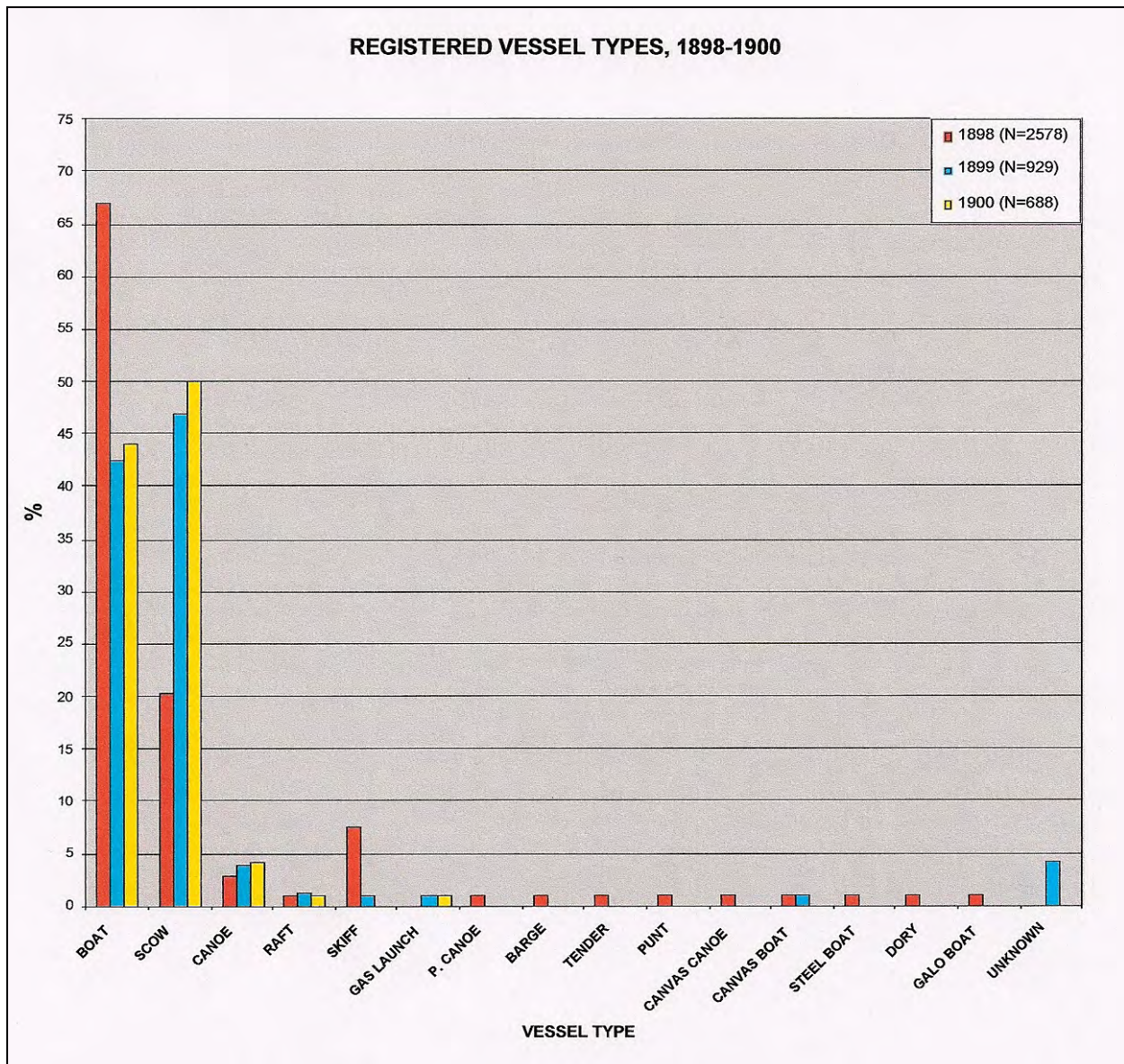


Figure 9. Registered Vessel Types 1898-1900.

The NWMP classification system gets slightly more difficult from here. Apart from the canoe-class and pram-class vessels just discussed, the 1898 vessel registry includes several extremely general categories of watercraft, these include “boat,” “skiff,” “tender,” and “dory.” Boats were often registered with their own number, although occasionally they were recorded but not given a registration number when accompanying another vessel such as a scow. Skiffs were rarely registered with their own number and almost always recorded in association with another vessel. Tenders were never registered on their own, and as the term implies, always accompanied another boat. Only one dory was mentioned in all three years of the NWMP

records. Boats, tenders and skiffs are all recorded in accompaniment with other vessels, so by definition the unnumbered boats and skiffs in accompaniment with other vessels could be called tenders. And it is possible that a tender could also be classified as a skiff, and it would certainly be a boat. It seems that in the late 18th century, the term skiff was somewhat interchangeable with tender. Kemp and Smith state that a skiff is “a small boat used by coast watermen for the conveyance of passengers” (1900:619). Skiffs and tenders appear on the several of the same pages, written in what appears to be the same handwriting, so it seems that the recorder was making some distinction between the two. It is impossible to know what that distinction may have been, however it may indicate a difference in size. The boats that are given a registration number could be either double-ended or have a transom. While the NWMP records leave uncertainty regarding these vessels, the gold seeker narratives indicate that these boats, skiffs, and tenders, along with the dory were most likely flat-bottomed, shallow draught vessels that could be described as bateau-class.

There were a total of 7 vessels registered as “canvas boats” in 1898 and 1899. It is uncertain if these were prefabricated, although it is quite likely as there were a number of canvas boats available for purchase in the 1890s. The Acme Folding Canvas Boat, the Eureka Canvas Folding Boat, and the Koshkonong Hunting Skiff were available through both the 1895 Montgomery Ward and Company catalog as well as the 1897 Sears, Roebuck and Company catalog. The Acme Folding Canvas Boat advertised in these two catalogs was 12 feet (3.66 m) long, 45 inches (1.14 m) wide, weighed 45 pounds (20.4 kg). The Acme Folding Boat Company also produced a 14-foot (4.27 m) model and a 16-foot (4.88 m) model; the latter was advertised in the January 1898 edition of Recreation magazine as the “Klondike Special” capable of carrying 1,500 pounds (680 kg). The Eureka Canvas Folding Boat was 10 feet (3.05 m) long, 36 inches (91.5 cm) wide, weighed 35 pounds (15.9 kg). However, both catalog companies noted that the Eureka Canvas Folding Boat did not “fold as compactly as the Acme, and of course [was] not as well made, but yet [was] strong and durable” (Montgomery Ward & Co. 1895; Sears Roebuck and Co. 1897). The Koshkonong Hunting Skiff was a 15-foot (4.57 m) canvas kayak that could carry 1,200-1,500 (544-680 kg) pounds.

In addition to the displacement vessels, and the non-displacement rafts registered by the NWMP, there are several anomalies in the NWMP registry such as the “gas launch” and the “galo boat.” It is uncertain what type of vessel the galo boat is. It is possible that this was a

clerical error, an abbreviation for “gasoline launch,” or possibly an abbreviation for “gondalow” or “gondolo,” which were American colonial terms for scows (Chapelle 1951). While the Klondike Gold Rush occurred more than 100 years after America’s colonial period, it is possible that the term was still in use by some Americans. In any case, there was only one boat in three years registered under this category.

5.4 Summary

Mass produced knockdown boats and canoes were readily available at the end of the 19th century. Historical narratives suggest that many Klondikers purchased these boats and transported them to Alaska but left them along the Chilkoot trail. The NWMP did register canoes, canvas canoes, and canvas boats that entered the Yukon, but these comprised a small portion of the total gold rush flotilla.

During the summer months, Klondikers could ferry their good across the chain of alpine lakes. This ferry system appears to be loosely organized, with those able and willing to provide services doing so for a period of time of their choosing. Historical documents tell us that at least one of the boats of the ferry system was a lapstrake construction, while another boat was a double-ended, square-rigged vessel. It is not known where the vessels used in the ferry system were originally constructed. At least one of the boats used in the ferry system was built at Lake Lindeman and portaged back to the alpine lakes. It then returned to Lindeman and went on towards Dawson.

Lakes Lindeman and Bennett became boat-building centers as they provided the first area along the trail with sizable trees that Klondikers could whipsaw into dimensional lumber. The rush of gold seekers heading to the Yukon saw early commercial manufacturing of boats by sawmills, which continued on for several years. Commercial boat builders used local spruce timber to build stock boat types, such as skiffs, scows and dories in standard sizes. One sawmill, which may have been the first to operate at the lakes, constructed lapstrake wide-stern skiffs. A second sawmill is known to have built dories and scows. Individuals also hired themselves out as boat builders, often taking a per diem wage as well as board. The price for a commercially built boat varied widely, and could be lessened if the buyer were willing to supply materials, help with building, or both. A buyer could also sometimes secure a boat if they could provide a much-needed commodity, such as nails, pitch, or oakum. When the White Pass railway was put

through to Bennett a number of sawmills and private individuals began building scows to take freight from Bennett to the gold fields.

Klondikers building their own boats could either whipsaw their lumber or trade labor for milled lumber. Many boats built in 1897 were twenty-two to twenty-five foot long, flat bottomed skiffs with flaring sides and wide square sterns, and a cargo capacity of two to three tons. However, large skiffs up to thirty-five feet in length and large scows were not uncommon. In addition, smaller boats were also built and used as tenders.

Many gold seekers traveled to the Yukon in groups, sharing resources and labor to construct boats. Women were not excluded from these exchanges, and at the least contributed boat building materials and performed tasks such as cooking for the group.

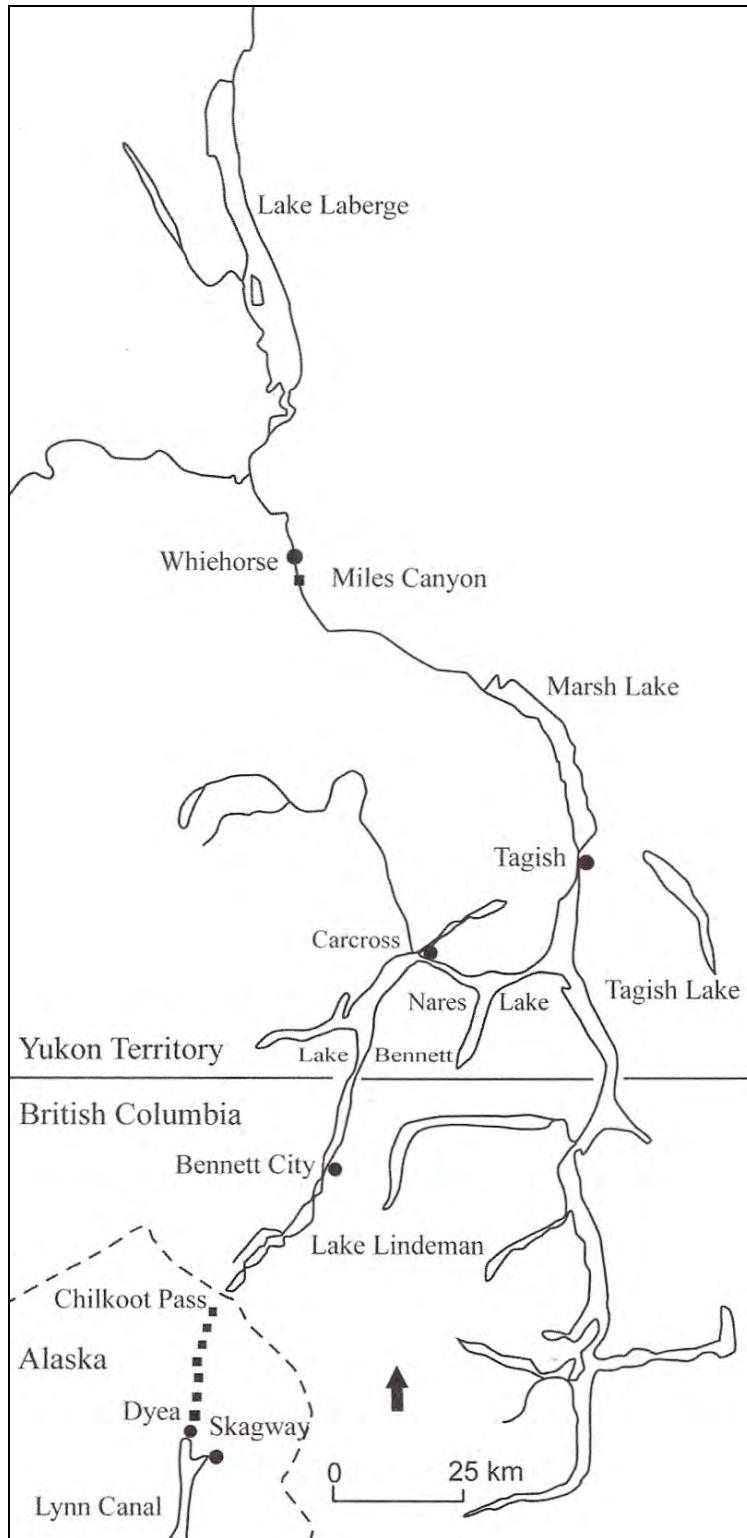


Figure 10. Map of Klondike Gold Rush route from Dyea to Lake Laberge. After Waddell 1979.

VI

Archaeological Evidence

Initial archaeological investigations along the Chilkoot Trail began in the 1970's and were focused on the development of a national park to commemorate the gold rush in both the United States and Canada. Efforts were made to locate the original trail, document the existing cultural material and settlement sites, and conduct emergency salvage of sites prior to building rehabilitation (Adams and Brauner 1991). The 1978 underwater archaeological survey conducted by Waddell for Parks Canada yielded information regarding the encampments and boats related to the ferry system at the alpine lakes just east of Chilkoot Pass. Three additional archaeological surveys conducted at various points along the gold rush trail completed by Vickers (1977), Murray and Hamilton (1984) and Easton (1986), are also discussed here. However, these surveys yielded much less information regarding Klondiker boats than did Waddell's underwater survey. The surveys conducted by Vickers (1977) and Murray and Hamilton (1984) were shore based and did not extend beyond Bennett City, in British Columbia. These surveys yielded information regarding camp life and water transportation infrastructure in the littoral area of Bennett City. Easton's (1987) survey focused on underwater heritage located in the Yukon Territory. The Yukon survey located many remains of the commercial sternwheelers that plied the Canadian river system from the gold rush into the 20th century. In addition to these remains, Easton (1986) also located the remains of two small vessels that are potentially Klondiker vernacular watercraft. Norris and Taylor (1986) provide additional information on a cache of canvas canoes near Chilkoot summit.

The archaeological material is presented here beginning at the Chilkoot Summit and following sequentially north along the trail (see Figures 7 and 10). The 1978 underwater survey measured extant boat remains in meters, however the vessels would have been built in feet and inches. The approximate corresponding measurement in feet and inches is given here first, followed by the metric measurement in parenthesis. All of the vessel remains found during the 1978 survey were left in situ; therefore a firsthand examination of the remains was not possible for this study. The measurements presented in this chapter are based solely on Waddell's 1979 report. Unfortunately, there are no measurements given for the possible gold rush vernacular watercraft in Easton's 1987 report.

6.1 Chilkoot Summit and the Alpine Lakes

The Chilkoot Summit is 3,500 ft (1,067 m) above sea level. Klondikers making their way over the pass made many trips from the camps lower down the mountain that were below tree-line, caching their goods along the way. Once over the summit, the trail led gradually downhill to Lake Lindeman, and could be hiked in one day depending on the load that was being carried. The winter allowed for traveling over the frozen lakes with sleds or pack animals, while a ferry system operated at all three alpine lakes during the summer months.

The remains of approximately 80 collapsible canvas boats are located near the Chilkoot Summit on the western, or American side. These boats may have numbered more than 80 at one time, with reports of “some 400 boats” in the 1960s and “nearly 200 boats” in the 1970s (Norris and Taylor 1986). All of the boats were at one time bundles of wood and hardware wrapped tightly in canvas. While some still remain bundled up, many have been opened up and strewn around the site (Norris and Taylor 1986).

Crater Lake

Crater lake is the first lake encountered east of the summit. It is approximately 1.2 miles (2 km) long with a narrows in the middle. A small island, referred to by Waddell as “North Crater Island,” is situated at the north end of the lake near to the shore. Identifiable lading and unloading areas, the remains of a semi-permanent habitation site used by those engaged in the ferry system, and the remains of several manufactured canvas and metal boats, as well as roughly built wooden boats have been located at Crater Lake (Murray and Hamilton 1984; Waddell 1979).

Near the lading area, the remains of two collapsible canoe frames, similar to those found on the American side of the Chilkoot Pass, and a sectional metal boat were located during the 1978 Parks Canada survey. The metal boat hull is made up of an outer skin of thin ferrous metal riveted together with soldered joints. It has an inner hull comprised of longitudinally layered wood. This sectional boat is joined athwartships with I-beam vertical structures providing both strength and a means of fastening the sections together. Measurements were not taken of the sectional boat. However, it was noted to be small and lightly built, with limited cargo capacity (Waddell 1979).

Evidence of a semi-permanent shore habitation site consisting of a large frame structure and several tent platforms was located along the eastern shore (Murray and Hamilton 1984; Waddell

1979). This site was determined to be a boatman's encampment, used by those operating in the ferry system at the lake (Murray and Hamilton 1984).

Waddell (1979) located the wreckage of a solid metal-hulled boat was also found near the narrows of Crater Lake. The hull is constructed of galvanized pressed steel sheeting riveted together and is approximately 27 ft 6 in (8.39 m) long and 9 ft 10 in (3 m) wide. A wooden keel, which is 3 in (7.5 cm) wide by 4 in (10 cm) thick in cross section, supports the hull. The hull sides are attached to the keel by rectangular shanked cut nails. The keel shows evidence of having had a keelson attached to it at some point via threaded bolts that protrude into the boat's interior. Both hull sides have three longitudinal wooden stringers that have metal step clamps riveted to the hull to secure them in place. Wooden gunwales are attached to the hull by rectangular-shanked cut nails and each gunwale has a crutch socket for oars. The transom has gudgeons fit through to a wooden sternpost. A wooden rudder located nearby the wreck had corresponding eyebolts that would have used a drop-in pin to fit to the gudgeons. The keel and rudder indicate that the vessel could be sailed as well as rowed. No mast or mast step were found, although the missing keelson might have shown evidence of a mast step (Waddell 1979).

A stone causeway divides the unloading area at the north end of the lake. Waddell (1979) noted that the causeway was at least in part handmade. The northwest side of the causeway is 13 ft 1 in (4 m) or less in depth, and protected by the prevailing wind by North Crater Island. The southeast side of the causeway has a shallow area with a depth of 16 ft 5 in (5 m) that drops off steeply underwater to 82 ft (25 m) or more. Piled stone features are located on the lakeshore on either side of the causeway (Waddell 1979). Remains of a semi-permanent habitation site are located near the causeway on the north shore of Crater Lake and include tent platforms, food containers, blacksmithing tools and wagon remnants. The roadway between Crater Lake and Long Lake is still evident (Murray and Hamilton 1984).

The remains of a submerged wooden wreck, possibly a scow, were located near the unloading area. The overall wreckage exceeded 16 ft 5 in (5 m) and consisted of frames, 2 in (5 cm) by 4 in (10 cm) in cross section, sandwiched between planking. The "upper skin" was constructed of discontinuous planks 2 3/4 in (7 cm) to 5 1/2 in (14 cm) in width while the planks making up the "lower skin" were 10 1/4 in (26 cm) wide. The frame spacing and plank widths and thicknesses were "virtually identical" to that of the wooden wreck located near North Crater Island (see below) (Waddell 1979:14).

The remains of a wooden boat, possibly double-ended, were located near North Crater Island. The fragmented hull remains indicate that this carvel built boat measured approximately 23 ft 3/4 in (7.03 m) long. Planks shorter than the full length of the boat were butt jointed on the frames using wire nails. The nails were both clenched and unclenched. Plank width varied between 10 1/4 in (26 cm) and 12 1/4 in (31 cm), and plank thickness varied between 3/4 in (2 cm) and 1 in (2.5 cm). Plank seams were caulked with cotton and wool fiber treated with tar and pitch. The nail pattern on the planks indicates the boat had eleven frames spaced variably between 15 3/4 in (40 cm) and 32 1/4 in (82 cm), with a mean spacing of 23 in (58.6 cm). Frames were beveled on the bottom to accommodate the chine and the maximal extent frame length was 27 1/4 in (69 cm). The frames measure 1 3/4 x 2 in (4.25 x 5 cm) in cross section. An identifiable thwart, 4 ft 9 in (1.45 m) in length, gives the vessel an approximate beam. One galvanized crutch socket was located in association with the wreck along with fragments of three oars (Waddell 1979).

Long Lake

Long Lake is approximately 1.4 miles (2.2 km) in length and 1/4 mile (400 m) wide. The edge of the boreal forest begins here, but the trees are scrubby and only 3-3.6 m (10-12 feet) tall (Adney 1994). Long Lake has an identifiable lading area at the southern end, and an unlading area at the northern end.

Near the lading area, the remains of stone foundations, tools and household items indicate a semi-permanent habitation site. The remains of a stone jetty, two sections of a broken oar, ferrous metal strapping, and two pieces of trunnelled worked wood were also located within the lading area. Waddell (1979) states that the morphology of the trunnelled wood fragments is more compatible with sled construction than with boat construction. This interpretation seems reliable as the Klondikers often used sleds to carry their outfits over the alpine lakes in the winter. Stone walls, and an intact oar, and artifact scatter associated with other forms of transportation including sled runners and harness parts were located at the unlading area (Murray and Hamilton 1984; Waddell 1979).

Planks measuring 24 ft 1 in (7.34 m) long, 11 in (28 cm) wide and 3/4 in (1.75 cm) thick were located along Long Lake's shore. Unidentifiable fragmented worked wood associated with the vessel remains were also found. In addition to this, wooden composite remains consisting of

three sets of planks sandwiched together and bolted through were found nearby. The composite remains are possibly part of a horse-drawn carriage and not part of a vessel (Waddell 1979). The planks of the composite construction are edge fastened with trunnels, and the seams of the plank walls are caulked with traces of paint on the caulking. Other transportation remains included four sleds that were located underwater along the shore (Waddell 1979).

A possible flat-bottomed, hard chine vessel with interior longitudinal supports was also located at Long Lake. The remains consisted of “vertical thwarts” (thwart risers?), a stem of three piece construction, and plank fragments with nail patterns of likely prior rib attachment (Waddell 1979). However, no remains of the frames or other internal features of the boat were found and no measurements are available.

Deep Lake

Deep Lake is 1/5 mile (300 m) from the northern shore of Long Lake. It is comprised of a stream running from Long Lake to a small “middle lake” and then a second stream running into the larger Deep Lake. It is approximately .75 mile (1.2 km) from the top of the middle lake to the far end of Deep Lake. Deep Lake’s suspected lading area is on the southern shore at the shortest distance from Long Lake, and is an area that could accommodate boat launching. No cultural remains were identified at Deep Lake’s suspected lading area.

The extant remains of a lapstrake boat, approximately 14 ft 7 in (4.45 m) long were found at Deep Lake. One hull side was not complete, but was structurally intact. The existing planks were 4 1/2 in (11 cm) wide, 3/8 in (1 cm) thick, and unjointed. The ribs measure 2 1/4 x 1 in (5.5 x 2.5 cm) in cross section and were evenly spaced 17 1/4 in (44 cm) apart with a maximum extant rib length of 30 in (76 cm). The ribs are not cut to fit the lap-streaked planks; instead wedges were inserted into the space between the plank and the rib. The ribs were attached to the planks by nails. A less complete hull section was found nearby, as was a floor frame assembly, which included a floor piece with beveled ends measuring 3 ft 11 3/4 in (1.21 m) long and grown knees nailed at either end (Waddell 1979).

The unloading area is situated in a shallow bay just north of Moose Creek, the Deep Lake drainage. A stone jetty, six tent platforms with historic artifact scatter and a metal frame boat were located in this area. The overall length of the boat measured 17 ft 1 1/2 in (5.22 m) with a beam of 4 ft 5 1/4 in (1.35 m). The boat was constructed of ferrous metal strapping, which is 1 x

3/16 in (2.54 cm x 4 mm) in cross section. Round and slot-headed bolts secured by nuts attach five longitudinal straps at the keel, either turn of the bilge, and the gunwales, to a series of metal strap ribs. Hand-made thole pins were attached to the existing gunwale. Canvas was present between the thole pin assembly and the gunwale, indicating that this was a canvas on frame construction (Murray and Hamilton 1984; Waddell 1979).

6.2 The Boat Building Centers

Lakes Lindeman and Bennett developed into large, itinerant tent cities during the gold rush as they were at the start of navigation, and had large enough trees for boat building. Lake Lindeman is 4.7 miles (7.5 km) long. A large tent city formed on Lindeman's shore occupying a .31 x .25 mile (500 x 400 m) area of level topography (Vickers 1978). The area was occupied until the completion of the White Pass Railway in July of 1899, which terminated beyond Lake Lindeman at Lake Bennett.

Lake Bennett was the terminus for both the Chilkoot and White Pass Trails. By May 1898, 1,000 tents and 40 wooden buildings housed approximately 2,500 people (Neufeld and Norris 1996). It has been suggested that the population of Bennett City reached as many as 10,000 people during the gold rush (Waddell 1979). As more gold seekers reached the lakes, timber resources were quickly depleted, requiring gold seekers to spread north along the shore toward Carcross. The White Pass Railway ensured that Bennett City was a larger and slightly longer lasting settlement than Lindeman City.

Lake Lindeman

Parks Canada undertook the first survey at Lake Lindeman in 1977. Two hundred and twenty six features, comprising eleven categories were recorded (Vickers 1978). The categories included; tent lines and platforms (seventy two), structures (twenty three), rock piles and rings (seventy five), rock alignments (nineteen), caches (five), pits, depressions and trenches (nineteen), posts (five), middens (two), mounds (three), causeways (two), and a single blacksmithing activity area (Vickers 1978).

Vickers (1978) determined that the rock alignments were retaining walls and incomplete tent lines, while the rock rings functioned as post supports or tent guy wire supports (1978:4). Some of the rock rings had post remains within them. The two causeways were constructed with

cobble, bridging deep gullies. The blacksmithing area was delineated by new and used horseshoe nails, horseshoes and horseshoe fragments, sled parts, miscellaneous metal scrap that had been cut with a cold chisel, coke and clinkers (Vickers 1978).

The 1978 Parks Canada survey located the wreckage of a carvel built hull on Lake Lindeman's shore. The remains of the vessel include a bow section measuring 11 ft 9 3/4 in (3.6 m) long. The sheer plank was 7 1/8 in (18 cm) wide and three lower planks were each 4 3/8 in (11 cm) wide. The planks were 1 in (2.5 cm) thick and are fasted to the frames by clenched nails. No frames were complete, the longest being 1 ft 11 5/8 in (60 cm), with a cross section of 1 3/8 x 1 5/8 in (3.5 x 4 cm) (Waddell 1979).

The 1984 archaeological survey recorded 33 features at Lindeman City, the majority being tent platforms but also several rock cairns or caches. The largest single artifact type found during the 1984 survey was metal food containers; with 85 different can types identified (Murray and Hamilton 1984).

Lake Bennett

The majority of material culture remains at Lake Bennett include tent platforms and metal food containers (Murray and Hamilton 1984). However previous surveys by Vickers (1978) and Waddell (1970) found several features related to inland water navigation.

At Bennett City (see Figure 11) Vickers (1978) noted terraced land, tent platforms, and the remains of a causeway linking the main road with a steamboat landing at the lakeshore. The remains of the steamboat landing consisted of rows of log pilings leading out to a now submerged dock. Waddell (1979) relocated the remains of the log pilings and a jetty, and determined that the jetty was suitable for vessels with up to a 4 ft 11 in (1.5 m) draught. The log pilings lead out to two submerged, parallel, rectangular log cribs filled with rocks. A second submerged feature was located 180 ft (55 m) east of the jetty. This feature also has log pilings leading from the shore to the underwater feature that consisted of rough sawn planks approximately 6 ft 7 in (2 m) long, layered both parallel and perpendicular to the shore. The planking was of various thicknesses up to 4 in (10 cm). The feature was held in place by a layer of large stone and ferrous metal spiking driven into the top planks. Other similar underwater features were noted nearby, but they did not have log pilings leading from the shore (Waddell 1979).

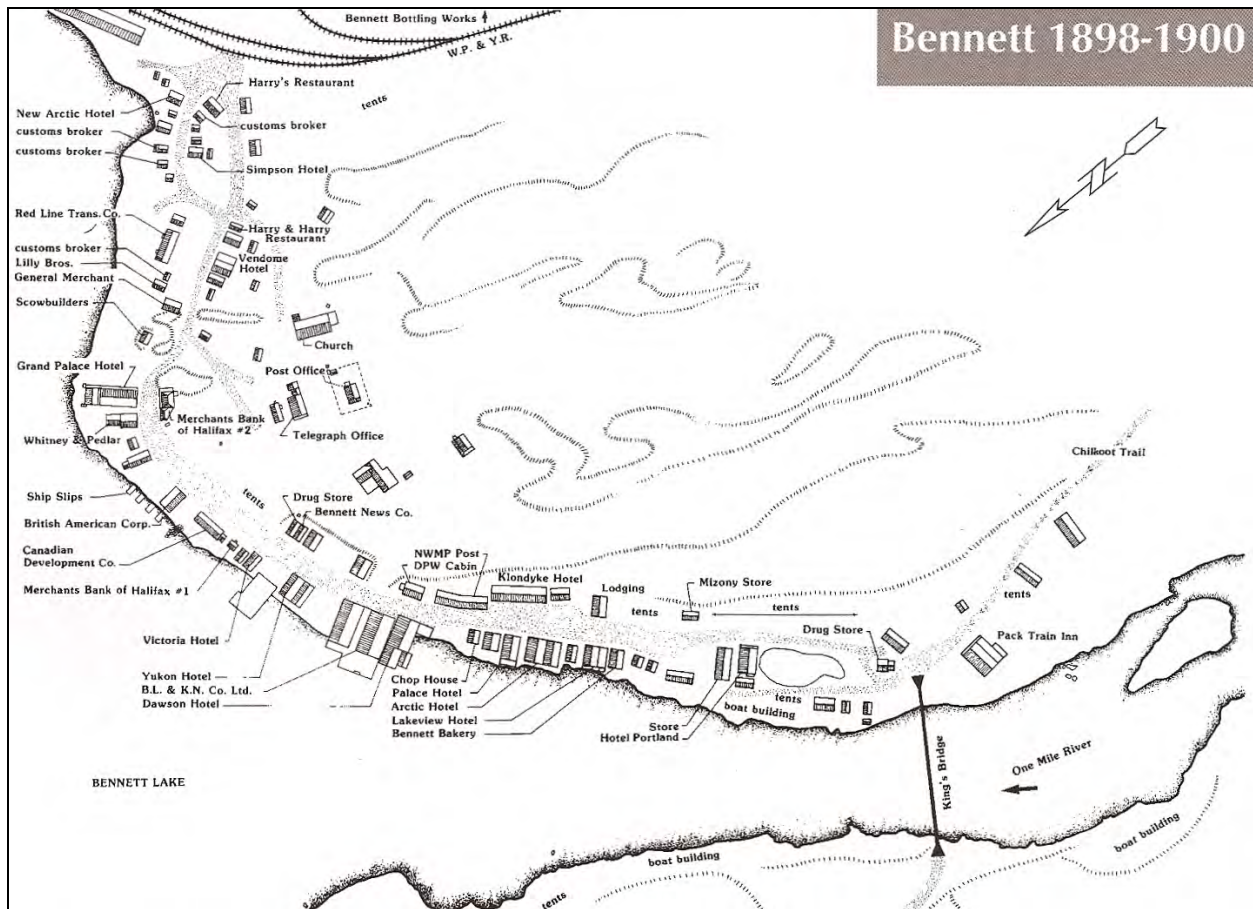


Figure 11. Bennett 1898-1900. *Chilkoot Trail: Heritage Route to the Klondike* by David Neufeld and Frank Norris, Harbour Publishing, 2005.

One Mile Creek is a shallow boulder filled creek separating Lakes Lindeman and Bennett. Waddell (1979) noted a series of cribworks composed of stacked and spiked logs and filled with rocks extend at right angles across the creek.

The Homan River is a tributary to Lake Bennett. It is known to have been a sawmill and boat building site. Archaeological investigations revealed a circular saw blade approximately 3 ft 3 3/8 in (1 m) in diameter, cast iron framing, brackets and bushings, metal fastenings, sled fragments, and tramway wheels and axels. The remains of what appeared to be a cellar with the letters "V.Y.T. Co." painted over an entrance were also located at the Homan River site ((Waddell 1979).

6.3 The Upper Yukon River and Lake Laberge

Along the Upper Yukon River, Miles Canyon and the Whitehorse Rapids were two considerable navigational obstacles faced by gold seekers (see Figure 10). Many gold seekers lost their outfits, their boats, or both in unsuccessful attempts to shoot the rapids. Klondikers who did not want to shoot the rapids had several options. They could portage their boat on a commercial tramway or they could hire a pilot to guide their boat through the whitewater. The waterway has changed since the gold rush, as the river has been dammed near Whitehorse. Waddell (1979) surveyed these areas but the significant water velocity at both Miles Canyon and the Whitehorse Rapids impeded his search.

Lake Laberge is 32 miles (52 km) long and is the largest and last of the lakes gold seekers had to navigate. Waddell (1979) conducted an initial search via airplane and spotted the remains of three sternwheelers but no small craft was identified.

During a 1986 Archaeological survey, Norm Easton located the remains of two possible gold rush vessels at Lake Laberge, the bow of a small, lapstrake vessel and the remains of a small, flat-bottomed, hard chine vessel. Unfortunately, Easton (1986) gives no measurements or details for either vessel. A poor quality photograph shows that the lapstrake vessel had at least eight planks per side, with the sheer plank being wider than the lower planks. The vessel also had a small inwale, but no other longitudinal structures can be seen. The closely spaced ribs are small and appear to have been bent in place and secured to the planks with nails. The second vessel is thought to be that of a flat-bottomed skiff's transom (Easton 1986). In addition to these remains, Easton noted in his report that "numerous substantial ships-timbers were discovered...[but that] at many localities these remains were found nearby contemporary campsites, where often as not, the timbers had been used to construct part of a shelter or face combustion in a quaint shoreside fire" (1986:208).

The wooden boat remains found at the alpine lakes, Lake Lindeman, and Lake Laberge could represent as many as eight different boats. None of the remains represent a complete boat, and only five of the vessels have any corresponding measurements (Table 2). The possible scow had an inner and outer layer of planking that sandwiched the frames. In Table 2, the first two lines each represent one of the planking layers. Of the five vessels whose overall lengths are unknown but the shortest measured section of planking is 11ft 9 3/4 in (3.6 m) and the longest is 24 ft 1 in (7.34 m). The planks widths vary between 4 1/2 in (11 cm) and 12 1/4 in (31 cm),

while the plank thickness varies between 3/8 in (1 cm) and 2.5 cm (1 in). Cross section frame measurements were noted on four of the vessels showing substantial variability between the boat frames. The smallest frame measured 2 1/4 x 1 in (5.5 x 2.5 cm) in cross section, while the largest frame measured 2 x 4 in (5 x 10 cm) in cross section. No definitive vessel beam is known from any of the wooden remains. However, a thwart associated with the North Crate Island double-ended vessel approximates its beam as 4 ft 9 in (1.45 m), while the floor timber associated with the lapstrake vessel found at Deep Lake indicate a bottom beam of at least 3 ft 11 3/4 in (1.21 m).

Table 2. Dimensions of extant vessels from the alpine lakes and Lake Lindeman.

Vessel	Approx. Length	Approx. Beam	Plank Width	Plank Thickness	Number of Frames	Extant Frame Length	Frame Cross-section	Frame Spacing
Scow?	16 ft 5 in (5 m)	?	2 3/4-5 1/2 in (7-14 cm)	?	?	?	2 x 4 in (5 x 10 cm)	15 3/4-32 1/4 in (40-82 cm)
“	“	“	10 1/4 in (26 cm)	“	?	?	“	“
Double-ended?	23 ft 3/4 in (7.03 m)	4 ft. 9 in (1.45 m)	10 1/4-12 1/4 in (26-31 cm)	3/4-1 in (2-2.5 cm)	11	27 1/4 in (69 cm)	1 3/4 x 2 in (4.25 x 5 cm)	15 3/4-32 1/4 in (40-82 cm)
?	24 ft 1 in (7.34 m)	?	11 in (28 cm)	3/4 in (1.75 cm)	?	?	?	?
Lap-strake	14 ft 7 in (4.45 m)	3 ft 3/4 in (1.21 m) on bottom	4 1/2 in (11 cm)	3/8 in (1 cm)	?	30 in (76 cm)	2 1/4 x 1 in (5.5 x 2.5 cm)	17 1/4 in (44 cm)
Skiff?	11 ft 9 3/4 in (3.6 m)	?	4 3/8-7 1/8 in (11-18 cm)	1 in (2.5 cm)	?	1 ft 11 5/8 in (60 cm)	1 x 1 5/8 in (3.5 x 4 cm)	?

6.4 Summary

Several archaeological surveys of the lake and river system between Chilkoot Pass and Lake Laberge were undertaken in the late 1970s through the mid-1980s. Two underwater surveys and two shore-based surveys have yielded information regarding the ferry system at the alpine lakes,

gold rush boat construction, and shore based water transport infrastructure. No vessel remains were found completely intact. The alpine lakes have identifiable lading and unloading areas, which include stone jetties and hand-made causeways. Evidence of the shore-side infrastructure related to water transportation can be seen at Lake Bennett.

The extent boat remains at the alpine lakes, and Lakes Lindeman and Laberge indicate that gold seekers built both carvel and lapstrake boats. In addition, vessel remains at the alpine lakes suggest that metal-hulled and knockdown boats were involved in the ferry system. Collapsible canoes were also noted at the alpine lakes, while a large cache of up to 80 collapsible canoes is on the west side of Chilkoot Pass.

The wooden remains from the alpine lakes, Lake Lindeman, and Lake Laberge could represent as many as eight different boats, although dimensional lumber was measured and recorded on only five of the vessels. The wooden vessel remains appear to represent a scow, transom skiffs, and perhaps a double-ended vessel.

Cut and wire nails were used in boat construction, however, only cut nails were observed on wooden vessel remains. The wire nails were clenched and unclenched, sometimes on the same boat. One wood fragment does have a trunnel, however, it is suspected of being part of a sled. There is no evidence of trunnels on any of the vessel remains. Some of the vessel remains were noted to have of raw cotton or wool caulking and tar or pitch in the seams. Associated boat remains include metal crutch and socket pieces as well as hand hewn thole pins.

VII

Photographic Evidence

The archival photographs repeatedly show Klondikers building and using pram-class and bateau-class vessels. The images below depict both classes of boats, sometimes within the same photograph. The discussion is split between the vessels of the ferry system and the vessels at the boat building centers. The vessels at the boat building centers are generally split between pram-class and bateau-class, with pram-class vessels discussed first. Where both vessel classes are represented in the same photograph, they are discussed together.

While it is impossible to discern accurate vessel dimensions from the photographs, estimates are made based on the relative size of any people who are pictured with the boats. These estimated sizes are given in feet and inches with the approximate corresponding metric measurement given in parenthesis. The photographs shown are available through online archives. Photographs discussed but not shown are available through traditional archives. All of the photographs are cited with a finding aid.

7.1 Boats of the Ferry System

Several photographs taken at Crater Lake and Long Lake provide supporting and supplementary information to the historical texts and archaeological material regarding the alpine lakes ferry system. One image (not shown, University of Washington Special Collections LaRoche 2048) of Crater Lake clearly shows tents on the steep and boulder filled shore at the lading area. Adney (1994) described the Crater Lake ferrymen's camp as being at the lading area when he passed through in 1897, and it is very possible that these tents belonged to the ferrymen. Two boats are in the water in the foreground of the photograph. One boat is a heavily laden wide-stern skiff, at least 16 ft 5 in (5 m) in length. No mast is visible, and one oar station can be seen just aft of the midsection. The second boat in the photograph is a rawhide (likely moose) frame boat. Twenty-eight people can be seen on the shore. However, the picture is too grainy to discern if any of them are indigenous.

The rawhide boat in the photograph sits empty in the water at the lake's edge, with the internal framing largely visible. It appears to have a central backbone with longitudinal framing just above the turn of the bilge and at the gunwale. Five longitudinal poles sit in the bilge on top

of at least nine bent frames. It is not possible to determine if the frames run from gunwale to gunwale. The bilge poles look sturdy and able to spread a heavy cargo load.



Figure 12. Klondikers with canoes and freight at the edge of Crater Lake, Chilkoot Trail, British Columbia, September 5, 1898. (University of Washington Libraries, Special Collections, Hegg464)

Figures 12 and 13 show Crater Lake and Long Lake in September of 1898. The Long Lake image is dated as September 4, 1899, while the Crater Lake image is dated September 5, 1898. In the Crater Lake image (Figure 12), two manufacture canoes and a carvel built double-ended vessel with two masts and a rudder can be seen. This vessel would likely have a keel, given that it had a rudder and two masts. It appears to have significant cargo capacity. It is possible that the remains found at North Crater Island are of this boat. However, no keel, mast, mast step, or rudder assembly were identified in the archaeological evidence of the North Crater Island boat.



Figure 13. Klondikers unloading freight from pack horses, south end of Long Lake, Chilkoot Trail, British Columbia, September 4, 1898. (University of Washington Libraries, Special Collections, Hegg466)

Three vessels can be seen in an image from Long Lake in 1898 (Figure 13). In the foreground, two boats are on shore at what is likely Long Lake's unloading area. A large double-ended vessel, similar to the vessel in Figure 12 can be seen in the water. There are striking similarities between the double-ended vessels in figures 12 and 13. Both boats have two masts and appear to be similarly sized carvel constructions. Both vessels have a very light colored hull, which almost appears to be painted white when compared to each vessel's dark gunwale, and the wooden skiffs on shore in Figure 13. It is not known if the double-ended vessel at Crater Lake is the same boat as the vessel at Long Lake or if these images show two separate boats. It might have been possible to portage the boat between the lakes, however the apparent size of the boat, and the 2-mile (3.2 km) distance between the lakes would have made it an arduous task. It is doubtful that such a boat would be portaged on a regular basis. It is also possible that the boat in Figure 13 is the same boat Tappan Adney used to cross Long Lake in 1897.

The two partially obscured boats on shore in Figure 13 appear to be transom skiffs, or possibly a transom skiff and a double-ended bateau, with moderately flaring sides. The boat in the foreground has two very wide planks per side, a narrow gunwale, considerable bottom rocker, and a steering crutch extending above the transom on the outside. The second boat has eight visible frames that appear evenly spaced, and a longitudinal stringer. No inwale can be seen, but a wooden brace between two frames at the sheer could be a rowing station, although no thole pins or crutch socket is evident. Neither vessel has a mast.

7.2 The Gold Rush Flotilla

Scows and punts can be seen in many of the archival photographs. Only a few of the images show these boats in any detail and rarely do they show a vessel's interior structures. Of those that do, often only part of the interior construction is visible. While vessel scantling sizes are difficult to determine from the photographs, it is possible to at least remark on their appearance, such as if frames appear even in size and spacing.

Gold seekers built their boats from green timber making it necessary to keep the boats in the water once the hull was completed so that the wood did not dry and split. Figure 14 shows finished hulls in the water at Lake Bennett. In the immediate foreground a large scow, three punts, a raft, a skiff and a bateau are evident. The large raft is made up of logs sandwiched together. There is no evidence of propulsion, such as mounts for oar sweeps, or a mast step. Numerous other boats in the background appear to be scows, double-ended bateaux, and wide-stern skiffs; many of these vessels have masts. Three men on shore are standing next to what appears to be a large scow.

Only one of the three punts (Figure 14) is entirely visible. All three punts are of a similar size but show some variability in construction detail. The two punts with visible bows show that the bow sections are sprung, making the bow narrower than the stern. All three punts have moderately flaring sides. Two of the punts have a raised notch on the transom for the steering oar, while the third punt has a notch cut into the transom for the same purpose. They also have raised wooden crutches or thole pins fore and aft of a central thwart. Both punts with the raised transom notch have inwales and gunwales but neither has a stringer. Their thwarts sit on blocks between two frames. Of these two boats, one has a small, unstayed mast. The other punt shows framing in the bow section, which might have been used to secure a mast. However, the framing

might only have been to create a space, which could be covered over to keep cargo dry. The third punt has no visible interior longitudinal supports and no mast.



Figure 14. Boats, scows and tent city along the shores of Bennett Lake, 1898. (University of Washington Libraries, Special Collections, AWC1904)

Neither scow in the water (Figure 14) shows flaring sides or a tapered bow. Both are stepped with a mast and the mast on the scow in the foreground is stayed. The probable scow on the shore has five planks per side. One very wide plank is possibly 10-12 in (25.4-30.05 cm), while the other planks appear to be about half that size. The overall dimensions of the vessel are undeterminable as one end is partially obscured from view. Judging by the height of the men, it appears to be at least 15 ft (4.57 m) long and about 3 ft (91 cm) from the gunwale to the bilge.

There are two bateau-class vessels in the foreground of Figure 14. A skiff with a sharp bow, narrow transom, and slightly flaring sides with five visible frames is sitting next to the large

scow in the water. A raised notch for a steering oar is visible on the transom. No mast is stepped but thole pins can be seen in the midsection of the vessel.

The second bateau-class boat in the foreground (Figure 14) is a small double-ended vessel with slightly flaring sides. The vessel's planking is fastened on the outside of the moderately raked, straight stem and stern. Visible longitudinal framing includes an inwale, a gunwale, and stringer just below the aft and amidships thwarts. The bow has a small foredeck, and nine frames can be seen. The frames appear similar in size and somewhat evenly spaced. Longitudinal planks form a sole over the floors. No thole pins, steering crutch, or rowlocks are visible, but there are two sets of blocks between the inwale and gunwale approximately where rowing stations would be. The angle that the photograph is taken from prevents us from seeing if a mast step is present.



Figure 15. Klondikers embarking at Bennett Lake, British Columbia, June 1, 1898. (University of Washington Libraries, Special Collections, Hegg229)

A photograph from Lake Bennett (Figure 15) shows good detail of the interior of several boats. The image highlights the simplicity of some of the Klondiker vessels, both in form and construction. In this photograph, three large scows, a large skiff and two smaller skiffs can be

seen in the foreground. A cluster of boats can be seen in the background; many of them appear to be large skiffs with masts.

The scow in the foreground has four wide planks and thirteen visible frames that are similar in size, and spaced somewhat evenly. The planking may be full length as there is no indication of butt blocks between any frames. The frames are rectangular in cross section, with the shorter edge against the planking and the longer edge extending into the scow. There is no full length longitudinal bracing, but there is a short longitudinal brace in the forward section near the gunwale. In addition, there are smaller longitudinal braces for thwarts. The stayed mast is lashed to a cross beam in the far forward section of the vessel. The midship thwart sits on a short timber suspended between two frames. All of the thwarts have a cut triangular knee securing them to a nearby frame. The crutches for rowing are little more than two pieces of timber nailed to the planks and rising above the sheer strake. The top of a steering crutch can be seen at the stern.

The other two large scows visible in Figure 15 appear to be similar in size to each other. These scows are loaded with goods so their internal structures are not visible. However, both scows have a brace or thwart in the forward third of the vessel just in front of their stayed masts. In the scow closer to shore, the mast appears to be lashed to this thwart. Sandwiched layers of half-round logs form a kind of deck structure on top of the forward thwart in both boats. Both masts have what is likely a furled square sail attached to a top yard. Thole pins for steering oars can be seen in the center the bow and stern on the scow closer to shore. The other scow appears to have thole pins offset on starboard side of the stern, while the port side is obscured from view.

The large skiff in the foreground (Figure 15) has three wide planks and one smaller sheer plank that are fastened to an inner stem and covered with a false stem. Interior framing includes twelve visible frames of similar size and spacing, a gunwale but no inwale, and five thwarts, one of which has a large hole in the center, where a mast would be stepped. Four rowing stations can be discerned by the presence of blocks, fixed between frames, on both the port and starboard sides. The blocks have two holes drilled in them, presumably for thole pins. A steering crutch is mounted to the transom. The number "1006" is painted on the bow. The NWMP registered vessel 1006 as a "boat" with five occupants, all from New Zealand (Library and Archives Canada, RG 18 D, Series 1-4). There are two small skiffs, partially visible in the foreground of Figure 15. The skiff closer to shore has eight visible frames, an inwale and four narrow thwarts.

The vessel appears to be at least 10 ft (3.05 m) in length and of lapstrake construction, with the frames cut on the plank side to accommodate the planking. There is no steering crutch on the transom. The second small skiff is a similar size with seven visible frames that appear to be evenly sized and spaced. It appears to be carvel construction as the frames rest flat against the planking. This skiff also has a small foredeck, an inwale, and one visible thwart. The stem has a large metal eye bolt protruding from the top with a painter attached to it. The transom has both a notch cut in it and two pieces of wood nailed either side of the notch to act as a steering crutch.

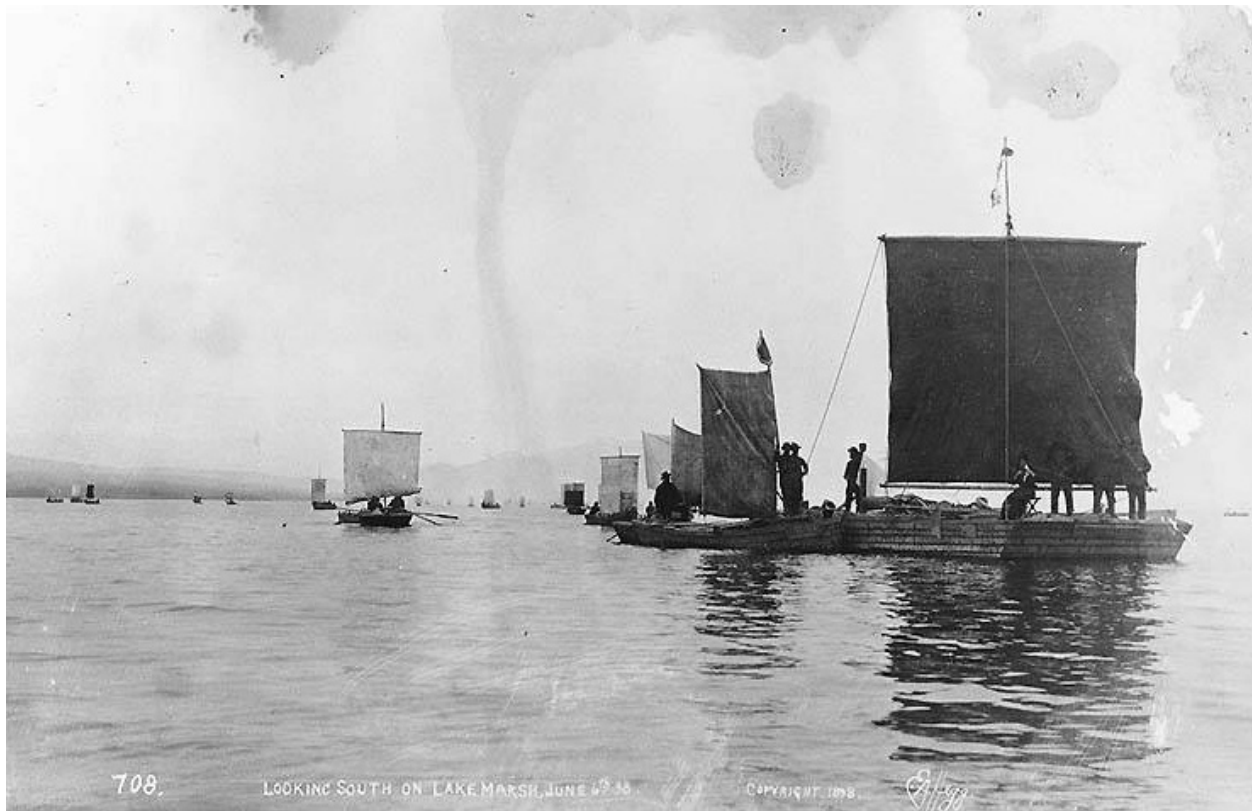


Figure 16. Klondikers in scows sailing down Marsh Lake, Yukon Territory, June 1898. (University of Washington Libraries, Special Collections, Hegg713)

A large scow can be seen in the foreground of Figure 16 showing the gold rush flotilla with sprit and square sails set on Lake Marsh in 1898. The scow has five visible planks, a stayed mast forward of the midsection, and a large square sail. The sail has a top yard and a boom with braces attached to the yard ends. A large tent can be seen erected in the aft section of the boat. Six people can be seen on the scow, with one man holding a steering oar at the stern, and one woman sitting on a chair at the bow. Wooden crutches with oars resting in them can be seen in

the forward section of the scow on the port and starboard sides. Two triangular shaped oar crutches offset from the center can also be seen at the bow.



Figure 17. Klondikers constructing scows at Bennett, British Columbia, September 1899. (University of Washington Libraries, Special Collections, AWC1707)

Large freight scows in various stages of construction can be seen in Figure 17, taken at Lake Bennett in September of 1899. The scow in the foreground has six visible planks above the water and one plank that is visible, but partially underwater. The scow sits empty in the water, so it is likely that it has a total of seven or perhaps eight planks per side. Eight frames are visible with three of the frames extending above the sheer and acting as stanchions around the perimeter of the hold. Large stanchions can be seen around the perimeter of the holds in the other three scows in the water. Three of the scows in the water have large fore and aft decks. Two of the decked scows also have thole pins at the bow and stern. None of the scows have a mast. The three scows in the water in the background appear to be slipped at a dock, and may be there to “take up” water in order to seal the plank seams.

King's Mill at Carcross built similar large freight scows. One image entitled, "Cattle Scow Ready to Launch – King's Mill, Caribou, U.Y.C." (not shown, Yukon Archives H.C. Barley Fonds 4677) is of a large scow with six planks per side, a fore and aft deck, and ten stanchions surrounding the hold. Three sets of thole pins are at the stern, one in the center and one on either side. No mast is apparent.



Figure 18. Klondikers crossing frozen Lake Laberge with boats and sleds outfitted with sails, Yukon Territory, 1897. (University of Washington Libraries, Special Collections, La Roche2101)

Three bateau-class boats can be seen (Figure 18) traveling across the ice on sleds with their square sails set. The boats are similar in design and size. Judging by the people in the picture, the boats appear to be at least 15 ft (4.57) long. The boat in front has five planks per side, while the other two boats have six planks per side. All three boats have straight, raking stems and sterns with a slight bottom rocker. Each has a mast stepped in the forward third of the boat. The sails on the front and rear boat appear to be canvas cloth, while the sail on the middle boat looks as though it might be a canvas tent that has been modified into a sail. All three sails have a top yard, and the sail on the front boat also has a boom. A steering crutch can be

seen extending up from the stern on each boat. Oars can be seen on the middle and rear boat approximately where a rowing station would likely be located. Gold seekers' outfits are estimated at being roughly a ton of weight, roughly 2,000 pounds (907 kg). Based on this assumption, and the number of people per boat in Figure 18, each boat would then be capable of carrying between 2 and 4 tons (1,814 and 3,628 kg).



Figure 19. Klondikers boatbuilding, possibly at either Bennett Lake or Lindeman Lake, ca. 1898. (University of Washington Libraries, Special Collections, UW22172)

Figure 19 shows a bateau-class vessel being built frame-first, upside down on the shore. The vessel appears to be at least 18 ft (5.49 m) in length, with a narrow bottom and flaring sides. The planking appears narrow and is rebated into the curved stem. Shadows can be seen on the planks on the inside of the hull, which may indicate that this is lapstrake construction. Eight frames are visible. The transverse frames are made up of three separate pieces of dimensional timber. Several of the people are seen holding hand tools, and it is interesting to note that one of the women is holding a handsaw.

Figure 20 shows three bateau-type boats of similar construction and dimensions, with curved stems and raked sterns. Each of the three vessels has eight visible smaller planks with one

wide sheer plank. The seams are visibly sealed and indicate that the planks do not extend the full length of the boats; rather the strakes are made up of shorter planks that have been jointed together. No internal structures are visible in any of the vessels. Each boat is fitted with a stayed mast forward of the midsection, while thole pins can be seen on each of the outside boats, aft of the midsection. Additional thole pins are visible on all three boats at the stern. Judging by the height of the men, the boats appear to be 22-26 ft (6.71-7.92 m) in length. Similarly to the three bateau-class vessels in Figure 18, the vessels in Figure 20 would likely carry between 2 to 4 tons (1,814 and 3,628 kg).



Figure 20. Three boats with people and freight, either on Bennett Lake or Lindeman Lake, ca. 1898. (University of Washington Libraries, Special Collections, UW26724)

Figure 21 likely shows one of the commercial sawmill and boat building yards at Lake Bennett, possibly the Homan River site. At least seventeen boats are visible in this photograph, all skiffs of a single design and a similar size. There are seven visible frames in one of the upright boats in the foreground. This boat, along with the boat next to it, shows a lack of framing in the bow section, with a large deck-like structure appearing to provide the strength in the forward section. The foredeck sits below the gunwale. The boat that is being framed in the

foreground also indicates that it will have a similar build, as there is absence of frames in the forward section. Inwales can be seen in the three upright boats. Gunwales can also be seen in these boats as well as in the overturned boat in the foreground. One of the upright boats also shows a longitudinal stringer extending from the forward deck aft, underneath the visible thwart.



Figure 21. Boat building at Bennett Lake during Klondike Gold Rush, 1897-98. (E.H. Hegg, Eva Davies Collection, Library and Archives Canada, accession number 1954-151, item 18, C-004688)

The boats in Figure 21 appear to be at least 16 ft (4.88 m) in length, and approximately 3 ft (92 cm) from the turn of the bilge to the gunwale. The overall beam appears to be between 5 and 6 ft (1.52 and 1.83 m). The boats are being built frame first and appear to have six planks per side, and fore-and-aft bottom planking. The bottoms have a discernable rocker. None of the boats have masts or thole pins along the sides, however these items might have been added at a later date. The transoms of at least two of the boats show cutouts for a steering oar, with thole pins protruding from either side of the cutout.

Figure 22 shows eleven somewhat visible boats in the foreground including three upturned skiffs appearing to be of similar design and dimensions. All three have slightly flaring sides and some amount of bottom rocker. They have six planks per side, with fore-and-aft bottom planking.



Figure 22. Boat building at Bennett, Bennett Lake, British Columbia, ca. 1898. (University of Washington Libraries, Special Collections, Hegg698)

Also visible on shore in Figure 22 are what appear to be an upright skiff and an upside-down vessel, whose type and construction details are difficult to discern. The aft section of the upright skiff shows four, evenly sized and spaced frames, and an inwale. Other internal structures are obscured from view. Two visible scows, along with several bateau-class boats can be seen anchored at the water's edge. The skiff (partially obscured by the scow in the water) has a large foredeck. The vessel in the bottom corner of the picture shows a small breasthook at the bow. Of the boats in the water, only the boat in the bottom corner of the picture shows any clear internal framing. In this boat nine, unevenly sized frames can be seen. Longitudinal framing in this vessel includes inwales and a stringer.

Figure 23 shows several men working at a whipsaw pit, with two boats at the water's edge, and several other indistinguishable boats farther down the shore. The two boats at the water's edge are large skiffs. The upright boat has twelve, evenly spaced visible frames. The transom is in place, but none of the side planking has been fixed to the frames. As with the skiffs in Figure 21, the upright skiff in Figure 23 appears to not have any frames in the bow. The second boat, which is upside down, shows that the bottom planking is fore-and-aft, and the bottom appears to have a slight fore-and-aft camber.



Figure 23. Boat building at Lindeman Lake, British Columbia, 1897. (University of Washington Libraries, Special Collections, La Roche2057)

Figure 24 demonstrates the combined use of space for boat building and living at Lake Bennett, illustrating that boats were built in any space not already occupied by a tent. The clearing in the foreground has at least six scows under and four bateaux and skiffs under construction. Several large scows can be seen in the background. Two of the scows in the

foreground have deck beams in place. Two of the skiffs shown in the foreground have men sitting or standing on their substantial deck structures; both have foredecks and side decks, and at least one of the boats has an aft deck.

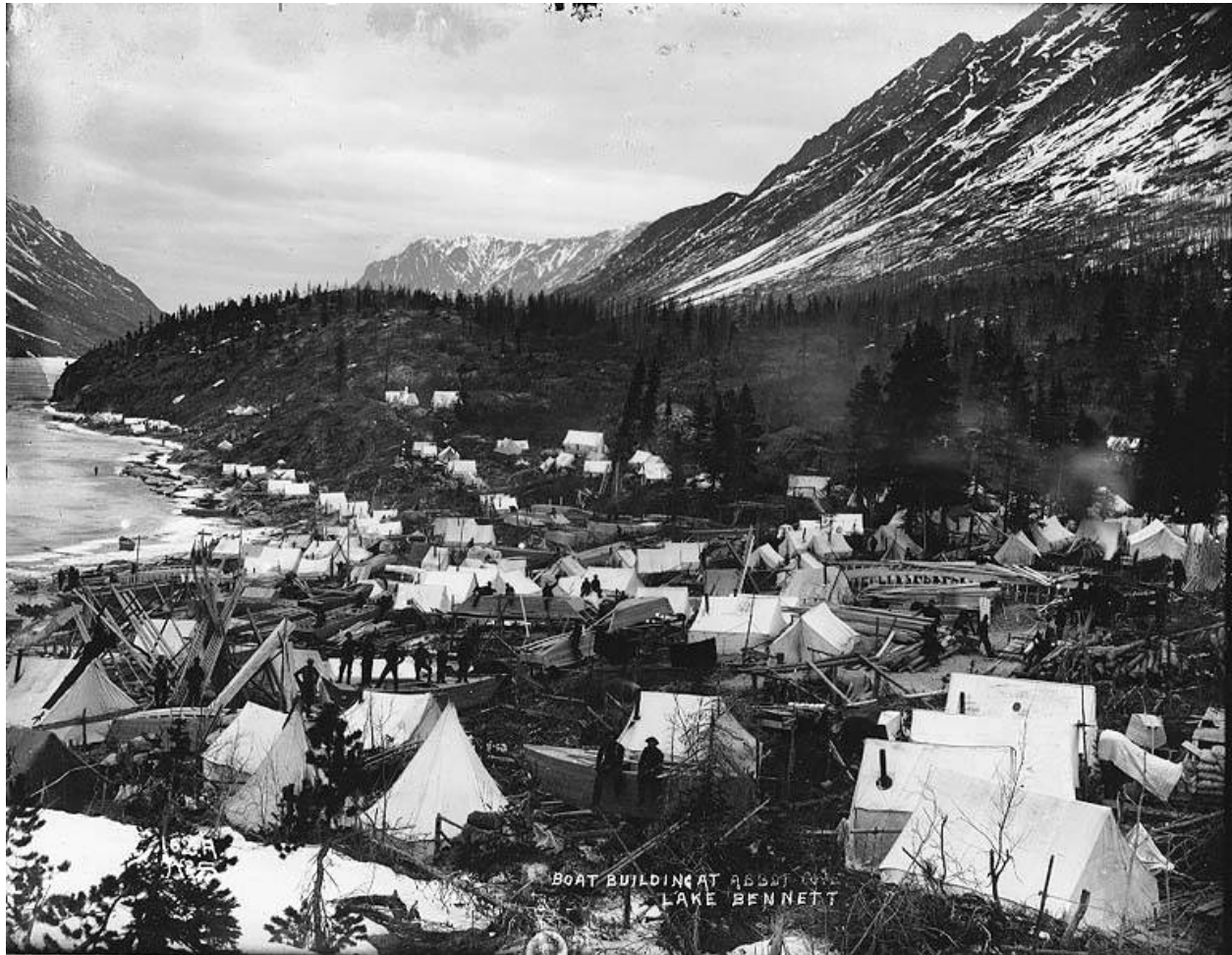


Figure 24. Boat building at Abbot Cove, Bennett Lake, British Columbia, May 1898. (University of Washington Libraries, Special Collections, Hegg266)

7.3 Summary

Several of the boats that operated in the ferry system have been documented in archival photographs. A large double-ended carvel vessel with two masts can be seen in images at both Crater Lake and Long Lake. It cannot be determined if this is the same vessel, or if two very similar vessels were operating at the same time in both lakes. Other smaller boats in photographs taken at the alpine lakes include transom skiffs, canoes, and a hide boat.

While there is considerable variability amongst the individual vessels at Lakes Lindeman and Bennett, the images show that many flat-bottomed vessels were of the pram and bateau-class. Many of the pram-class boats are large scows but small punts are also present. The bateau-class boats include both double-ended vessels and vessels with a sharp bow and transom stern. The images indicate that these boats were largely frame-first construction, with fore-and-aft bottom planking. Dimensional lumber appears roughly cut, and plank width appears variable. The use of hardware, apart from nails, appears minimal with most thole pins or crutches for oars being rudely cut lumber nailed to the side or transom planks.

The pram-class boats vary in size and finished appearance, with some of the larger scows being built very crudely. Steering crutches and thole pins are used on both ends of many of scows. Their placement varies, with some scows having only a central steering point, and others having the steering crutches offset to the sides, while other scows have three points for steering along the bow and stern. In addition, some of the scows have steering crutches near the mast on the port and starboard sides. Several of the smaller prams have tapered sides at the bow. They appear to have only one central steering crutch or notch cut into the transom, with additional wooden crutches at the rowing stations.

The archival images suggest that both carvel and lapstrake construction methods were used to build the bateau-class boats at Lakes Lindeman and Bennett. The double-ended vessels show raking stems and sterns, as well as curved stems. Slight bottom rocker can be seen on many vessels. Most vessels have somewhat flaring sides. Internal structures are variable, especially with elements such as longitudinal stringers, inwales, and thwart. Moderate foredecks can be seen on a number of wide-stern skiffs, but breast hooks are rare and no photographs show any quarter knees. Steering crutches and notches can be seen at the stern and thole pins can be seen at the sides of several of the completed vessels.

Stayed and unstayed masts can be seen on many of the pram-class and bateau-class vessels and are often in the forward third of the boats. Gold rush vessels are known to have used spritsails, lugsails, and square sails. Square sails predominate and were made of canvas cloth or sometimes canvas tents. No images depict the use of leeboards or rudders, while many photographs show the gold seekers using long steering oars.

VIII

Analysis and Discussion

The study has asked four questions: first, what were the boat types used by the gold seekers along the Chilkoot Trail and Upper Yukon River during Klondike Gold Rush; second, what influenced boat types and construction methods; third, how do the watercraft express Klondikers' process of adaptation in the mining frontier; and finally, what are identifiable features of gold rush vessels? The previous chapters have shown that there were two areas of navigation, the alpine lakes, and the Upper Yukon River and its tributary lakes. Both areas saw itinerant occupation, the production and use of watercraft, and corresponding economic systems based around water transport.

8.1 Ferry System Vessel Types, Influences, and Features

The nature of the gold rush trail through Chilkoot Pass necessitated the use of boats at the alpine lakes for summer freighting. Klondiker narratives indicate that the ferry system was loosely operated, with those who wished to take part in ferrying goods simply providing a boat to do so, for the length of time that they desired. The archaeological record evidences features such as stone jetties, causeways, tent platforms, stone walls, and other items indicative of semi-permanent habitation near the lading or unlading areas. This suggests that at least some people involved in the ferry system occupied the area for longer durations of time.

Vessel types at the alpine lakes appear have been influenced most by economic factors, with those involved in the ferry system using any possible means of transporting goods. Vessel finds at the alpine lakes include small knockdown boats and canvas canoes, a larger metal-hulled boat, and possibly as many as five wooden boats. Waddell (1979) asserts that the smaller manufactured boats found at Crater Lake and Deep Lake were probably not part of the ferry system due to their limited cargo capacity, but he does not account for their deposition. This begs the question: why would Klondikers, intending to take these boats to the gold fields, change their minds after crossing over Chilkoot Pass? Klondiker accounts do mention that many knockdown boats and canoes were brought north to the Alaskan ports and discarded along the trail. However, it seems more likely that these vessels, which were not lightweight, would have been discarded earlier in the trip. Archival photographs depict canoes in the water at Crater Lake's lading area.

In addition, several Klondiker narratives indicate that it was possible to hire a boat and not the ferryman. It is possible that ferry operators hired out some of small manufactured watercraft, which would be an economical way to increase a day's wages.

Conversely, the 80 collapsible canvas boats cached on the west side of Chilkoot Pass were probably not intended for use in the ferry system. One hypothesis maintains that the boats were brought up the pass with the intention of selling them to the Klondikers, but reached the pass too late to be a valuable commodity (Waddell 1979). A second hypothesis suggests that the boats were owned by the gold rush freight company, Flowers, Smith & Company, who the NWMP would not allow to import the boats as they were "shoddy merchandise," not capable of carrying a full outfit, and therefore potentially dangerous (see Norris and Taylor 1986). It is doubtful that the NWMP restricted the use of collapsible boats and canoes along the inland waterways as they registered these types of watercraft at their Bennett and Tagish posts. In addition, canoes can be seen in several archival photographs at various places along the gold rush route. However, it is possible that the boats belonged to, and were left behind by the Flowers, Smith & Company.

The Flowers, Smith & Company was a distributor of both sectional metal boats as well as collapsible canvas boats. They built a dock and a warehouse at Lake Lindeman, which was to be the base of their transport company (Norris and Taylor 1986). The boundary dispute between the United States and Canada saw the NWMP set up a Chilkoot Pass post, as well as confiscate land at Lake Lindeman that had been claimed by Americans. Andrews has proposed that the boats at the pass did indeed belong to the Flowers, Smith & Company and were on their way to the Lake Lindeman warehouse, but left at the summit when the operations at Lake Lindeman were confiscated (Norris and Taylor 1986).

It is also possible that the Klondikers themselves jettisoned these boats along the Chilkoot Trail. However, this is also unlikely as the boats were found in a large cache near the summit and not intermittently along the trail. As with the small watercraft at the alpine lakes, it seems doubtful that they would discard their boats at the start of water navigation, after hauling them up to the summit. A more likely explanation for their deposition on the American side is that the Flowers, Smith & Company, or whomever might have owned the boats, were unable, or unwilling, to pay a duty on the merchandise, and could not bring the boats into Canada.

Another anomaly at the alpine lakes is evidenced in an archival photograph (not shown, University of Washington Special Collections LaRoche 2048), which depicts a native hide boat at the lading area of Crater Lake. Rawhide frame boats were common to all of the Yukon's indigenous groups, and the internal framing for the boats "varied according to the available raw material, the need of the vessel and the amount of time spent building it" (Easton 1986: 10). Rawhide boats ranged in size but were known to be as large as 16 ft 5 in (5 m), and could be built in one day using small, green spruce poles, fleshed and de-haired rawhide, and pitch to cover the seams (Easton 1986; McClellan 1975).

There are several possibilities for the presence of the hide boat in the photograph. The coastal Tlingit and the inland Tagish worked as packers along the Chilkoot Trail. It is possible that the indigenous packers were also involved in freighting at the alpine lakes, using skin and other types of boats. Klondiker narratives discuss the role of indigenous packers from tidewater to summit, but do not illuminate the role, if any, of indigenous people in the ferry system. Another possibility is that the skin boat was sold to a Klondiker who used it for ferrying goods, or intended to use it for travel on to the gold fields. Or perhaps the skin boat seen in the archival photograph at Crater Lake was used solely for native transport. It seems unlikely that a Klondiker would have built a skin boat for use at the alpine lakes when other options, such as knockdown boats, were close at hand. Rawhide boats were prone to being waterlogged therefore travel was often done in the early part of a day to allow time for the boat to dry out overnight and be ready for use the next day (McClellan 1975). Therefore it seems unlikely that hide boats would have been used at the ferry system to any great extent. However, the possible indigenous role in the ferry system needs more investigation. It is unlikely that skin boats will be found in the archaeological record as the hide was often removed from the frame and reused when the boat was no longer needed (McClellan 1975). Perhaps historical sources will help to address this question in the future.

Other vessels at the alpine lakes include a large metal-hulled vessel and several wooden boats. The size of the larger metal-hulled boat at Crater Lake indicates that it was almost certainly brought over the pass in sections and assembled at the lake. This boat is the only boat known to have used cut nails instead of wire nails, which could indicate that it was operating at the ferry system from an early date.

Crater Lake is above tree line, meaning that the wooden boats found there were built somewhere else and brought in, or the lumber to build the boats was brought in, and the boats built at the lakes. It is probable that lumber would have come from Lakes Lindeman or Bennett and not have been brought over Chilkoot Pass, as packers were often unwilling to carry lumber (Adney 1994). This is likely the case for wooden vessels at Long Lake and Deep Lake too. The larger double-ended vessel seen in the archival images (Figure 12 and 13) at Crater and Long Lake was probably built at the alpine lakes. The large sizes of the double-ended vessels would make portaging them from the boat building centers up to the alpine lakes unlikely.

The smaller boats used in the ferry system could have been built at Lake Lindeman and transported back to the alpine lakes. One Klondiker narrative explains that this was the case for the boat he used to ferry goods at the alpine lakes (Barton 1897). The archaeological record shows this is a possibility for other boats as well. The lapstrake boat found at Deep Lake had thin and narrow planks indicating a small, lightly built boat that would have been possible to portage between Lake Lindeman and the alpine lakes.

The wooden boat remains found at the alpine lakes possibly represent five different pram and bateau-class vessels. Although the one vessel that could be considered a scow is questionable as to if it were actually a vessel or a part of a shore structure. Waddell's (1979) assertion that this vessel was a scow is based on the similarity in scantling sizes with the possible double-ended vessel also found at Crater Lake, and the lack of an identifiable stem or stern. It is not clear from Waddell's (1979) report if the section of the possible scow is the bottom or the sides. This possible vessel had inner and outer planking sandwiching the frames. While it seems plausible that the bottom of a scow could have a floor over the frames, it would be unusual for this vessel to have a ceiling. Adding a ceiling would have been more expensive in terms of labor and materials. It is possible that the wooden remains are not from a vessel, but were part of a shore structure, possibly related to several rock pilings on the nearby shore.

In 1897, common plank widths for gold rush vessels were 9-10 in (23-25 cm), while in 1898 planks widths were reduced to 6 in (15 cm) (Adney 1994; Stanley 1898). Three of the possible vessels from the alpine lakes have plank widths over 10 in (25 cm), while the Deep Lake vessel has planks less than 6 in (15 cm) wide. It is possible that these vessels dates correspond to Klondiker reports of plank widths, with three of the alpine lakes vessels being earlier than 1898 and Deep Lake vessel dating to 1898 or later. Interestingly, planking on one

side of the frames of the possible scow measured 10 1/4 in (26 cm) and was continuous, while planking on the other side was not continuous and measured between 2 3/4–5 1/2 in (7-14 cm). If this is a vessel, and not part of a shore structure, perhaps the smaller planking was added at a later date to reinforce the hull. However, the dating of vessels by their planking width is not a reliable dating system at the alpine lakes, as the lumber for those vessels might have come from the smaller forests closer to the alpine lakes.

Crater Lake and Long Lake each had vessel remains of what were possibly double-ended vessels. Waddell (1979) stipulates the planking remains along Long Lake's shore could be flotsam from Crater Lake's double-ended vessel, as the planking dimensions are nearly identical. Another possibility is that there were two similarly constructed double-ended boats, one operating at Crater Lake and one operating at Long Lake. Large double-ended vessels are seen at both lakes in archival photographs dated one day apart. The planking found at Long Lake was located close to the modern hiking trail. Degradation from weather, ice, and hikers could account for the paucity of remains.

Construction, Hardware, and Propulsion

Wooden vessels at the alpine lakes were both carvel and lapstrake construction, fastened with clenched and unclenched wire nails. No complete wooden vessels have been found, but remains at the alpine lakes indicate is that wooden vessels were mostly bateau-class and ranged between approximately 14-24 ft (4.27-7.34 m). Vessels with variable plank thickness and frame spacing may have been built by a novice or hurried builder. The lapstrake vessel at Deep Lake had even frame spacing and used grown knees for the floor assembly, suggesting that this vessel was built by someone with more knowledge of boat construction. The Deep Lake boat had 3/8 in (1 cm) thick planks, with a large rib size of 2 1/4 x 1 in (5.5 x 2.5 cm). The Rudolph, Marcos and Rocco sawmill is reported to have built "crude but strong" flat bottom lapstrake wide-stern skiffs with 1/2 in (1.3 cm) thick planking (Wells 1984). Given that the Deep Lake boat was light in build and could have been portaged from Lake Lindeman back to the alpine lakes, it is plausible that it was built commercially at Lake Lindeman or Bennett, possibly by the Rudolph, Marcos and Rocco sawmill, or an independent boat builder.

Both oar and sail propelled vessels operating in the ferry system at the alpine lakes. Galvanized crutch sockets were found at Crater and Deep Lakes, and the manufactured canvas-

on-metal strapping canoe had been modified with crude thole pins (Waddell 1979). Clear indications for sail propulsion were not found on the wooden wreck remains, but can be seen in the archival photographs and are detailed in the historical record. The best indication for sail in the archaeological record comes from the large metal boat found at Crater Lake, which had a rudder and a keel, both indicating that this vessel had sailing capacity.

Some of the vessel remains were noted to have evidence of raw cotton or wool caulking and tar or pitch in the seams. Klondiker narratives discuss the use of caulking and tar, the difficulty and expense in obtaining these items at various times, and the substitution of spruce pitch for tar.

8.2 Gold Rush Flotilla Vessel Types, Influences, and Features

The NWMP designated a vessel type for 4,156 vessels that they registered between 1898 and 1900. Of those vessels, 2,641 (approximately 64 % of the classified registered vessels) were designated as boats, skiffs, tenders, and one was a dory. During those same three years the NWMP registered 1,317 vessels (approximately 32%) as scows, barges, and punts, and 166 vessels (approximately 4%) as canoes or canvas boats. Rafts, gas launches, one steel boat, and one “galo” boat comprise the remaining registered and classified vessels and total 32 (less than 1%) (Library and Archives Canada, RG 18 D, Series 1-4).

The boats, skiffs, and the dory can all be classified as bateau-class vessels based on Chapelle’s (1951) definition that vessels of the bateau-class are flat-bottomed bateaux, dories, and river skiffs with fore-and-aft bottom planking combined with a transverse frame-system. Scows, barges, and punts can all similarly be grouped together and designated as pram-class vessels. It is impossible to say for certain whether the “tenders” were of the bateau-class or the pram-class. It seems somewhat more likely that they would be of the bateau-class as their purpose would be to aid a larger vessel in lightering or to be maneuverable in instances where the larger vessel could not be. A total of 13 vessels were designated as tenders, all in 1898.

The NWMP records indicate that pram-class and bateau-class vessels were the predominant watercraft (96% of the total registered, classified vessels) entering the Yukon Territory between 1898-1900. The photographic evidence from the boat building centers at Lakes Lindeman and Bennett appears to correspond with the NWMP records. Numerous pictures depict pram-class

and bateau-class vessels, with occasional depictions of other types of vessels, such as canoes and rafts.

The photographs of pram-class vessels (Figures 14, 15, 16,17, and 24) indicate that they were mainly large scows, however some smaller punts are also evident. Klondiker narratives indicate that large groups such as the Monitor Gold Mining and Trading Company used scows in the initial year of the gold rush. Scow use in the later years of the gold rush appears to have coincided with the completion of the White Pass Railway to Bennett City, where scows were used to transport livestock and other cargo from the train depot at Bennett City to the gold fields. Early scows of the gold seekers can be seen in the archival photographs as being fit with masts and square sails. The NWMP records from 1899 and 1900 indicate that many of the large freight scows were towed behind sternwheelers, which would negate the need for a mast and sail (Library and Archives Canada, RG 18 D, Series 1-4).

Pram-class vessels are suited to a riverine environment and would have been the easiest type of vessel for Klondikers to build. In addition, large scows could carry a lot of cargo, and were capable of having a tent erected in a portion of the hull, making the vessel more livable. It is possible that in 1897-1898 the scow suited Klondikers who were part of a large party, had a lot of cargo, or were inclined to “live-aboard” for the entire trip to Dawson.

The bateau-class vessels depicted in archival photographs (Figures 18, 19, 20, 21, 22, 23, and 24) seem to be of two hull shapes, those that were double-ended and those that had a transom stern. Many of the bateau-class boats seen in archival images have a similar appearance to the bank dory, which was used extensively in the Atlantic cod fisheries from the mid 1830s onwards and gained in popularity among amateur boat builders in the late 1880s (Gardner 1978). The problem with labeling the gold seekers boats as dories is that the term dory refers to a construction method and not a hull shape. Dory construction starts with forming a fore-and-aft planked flat bottom. The bottom is then shaped, determining the shape of the hull. Next the stem, transom, and frames are attached to the bottom. Then wide boards are then bent around the bottom; with their placement governed by the natural bend the plank will take (Gardener 1978). It is impossible to say whether or not completed boats seen in the archival photographs were dory construction, built bottom first. However some of the archival images depicting bateau-class boats under construction show the boats being built frame first, then side planked, and finally bottom planked.

Regardless of the construction method, it is possible that the bank dory was an influence for some of the double-ended boats. It was a popular boat around the time of the gold rush. In the case of the only boat to be classified as a dory on the NWMP records, this type of boat was almost certainly influenced by the owner's origins as the NWMP note that the three occupants of the boat were from Providence, Rhode Island (Library and Archives Canada, RG 18 D, Series 1-4).

As many as six commercial sawmills and boat building businesses operated at Lake Bennett during the gold rush (Neufeld and Norris 1996). The historical texts and archival photographs indicate that many boats were built by the commercial sawmills and sold to the Klondikers. The NWMP arrived at Bennett in early 1898 and began enforcing timber licensing for Klondikers wishing to cut timber for boats. In addition to this perceived inconvenience, many Klondikers found whipsawing their own timber difficult. The sawmills were busy cutting timber for their own boat building businesses and enlisted gold seekers who were willing to cut trees for the mill by giving them a portion of the lumber. In this way, many Klondikers avoided both having to purchase a timber license and the rigors of whipsawing. It seems likely that many of the gold rush boats built by the sawmills, or with timber from the sawmills, would have used similar sized dimensional lumber for planking. It also seems likely that sawmills would build "stock" boats as opposed to custom boats. Sawmills were operating at the boat building centers from an early date and it is likely that the sawmills influenced the types of boats built by individual Klondikers, by providing a model by which to follow. Klondikers could learn to build boats through observation and imitation.

The transom skiffs would have been relatively easy for Klondikers to build. Their wide transom would have enabled them to be weighted down in the aft section, which many archival photographs show was the case when these boats were underway. Having the weight distributed forward and aft would allow for room in the middle of the boat where the rowing stations were. It is plausible that the relative ease in build, good cargo capacity, the ability to have weight distributed throughout the boat, and multiple examples of the boat would have influenced Klondikers toward this build.

Canoes, canvas boats, gas launches, and rafts were also used between 1898-1900. Canoes were more prevalent, although none of these types were used extensively. In some cases they were not the main vessel, but were used in conjunction with scows, skiffs, and bateaux. The

canoes and canvas boats were most likely predominantly manufactured items brought to the north, and not fashioned from the forest surrounding the boat building centers. Although some canvas boats may have been built along the trail using local wood for framing (Andey 1994; Lokke 1965). Small, manufactured boats were not prevalent amongst the gold rush flotilla, probably due to several reasons. The effort of hauling a small boat over Chilkoot Pass might have proved too much for many, Klondikers might have been uneasy with navigating the entire trip to the gold fields on their own, the boats might not have had ample cargo capacity, or partnerships formed along the trail might have influenced Klondikers to pool their resources and build larger boats together.

Construction, Hardware, and Propulsion

Chapelle states “‘good boat building’ is no more than ‘good enough to do the job and last the required time,’ and has no particular relation to rabbeting, notching, or boxing in the framework” (1951:5). Gold rush vessel construction was “rough” but by no means inadequate, as many of the Klondikers succeeded in reaching the gold fields. The historical, archaeological and photographic evidence demonstrate that both lapstrake and carvel techniques were employed in gold rush vessel construction. Bateau-class vessels at the boat building centers purportedly ranged between 15-37 ft (4.57-11.28 m), but were commonly 22-25 ft (6.71-7.62 m) in length. The sizes of scows are not as well documented at bateaux in either the historical or archaeological record, although they are known to have been as large as 42 ft (12.80 m).

Many of the gold rush vessels had simple structural elements such as inwales, gunwales, and stringers, but often lacked breasthooks and quarter knees. Many of the scows, both those built by individuals and by commercial scow builders have evidence of decking. Small forward decks can also be seen on many of the transom skiffs, including commercially built ones. Side and aft decking is also evident, but to a lesser extent. Many bateau-class vessels had slightly flaring sides and moderate bottom rocker with the bottoms fore-and-aft planked. Flaring sides would give the vessels more initial stability, as well as provide a larger volume for cargo. Bottom rocker allows for increased maneuverability, which would be an important consideration for anyone considering running Miles Canyon and White Horse Rapids.

Klondiker narratives discuss the price of wire nails, but both wire nails and cut nails are evident in the archaeological record. However cut nails were only found on the metal-hulled boat

at Crater Lake, while all of the wooden boat remains had wire nails. There is no indication of trunnels being used in any of the extant vessel remains, or in the historical and photographic evidence. Trunnels were used on sleds, however it is not known if they were also used for building boats. The use of trunnels should remain a possibility considering the dearth of metal fastenings along the trail. The use of other types of metal hardware does not appear to have been widespread amongst the vernacular watercraft. The archaeological record does show the use of metal boat crutches at the alpine lakes, and two incomplete cast iron boat crutches from Bennett City (Waddell 1979). However, the archival photographs indicate that typical rowing stations were simple wooden crutches or thole pins made from local timbers, and that steering was done using both wooden steering crutches fixed to the transom and sculling notches cut into the transom.

Klondikers used square, sprit, and lug sails made from canvas cloth. Canvas tents also functioned as sails. Rope and blocks were used in conjunction with stayed and unstayed masts. Images of stayed masts with large square sails set also show that braces were often attached to the yardarms. Braces allow for horizontal movement of the yard. They can be used during short squalls to angle the yard, effectively reefing the sail. Klondikers might have chosen to have an unstayed mast if they did not have enough rope to stay the mast and brace the yardarms. An unstayed mast would be more flexible than a stayed mast, allowing for wind to be spilled from the sail during a squall, and for the vessel to remain more upright. Knowledge of vessel rigging would likely have been even more obscure than knowledge of boat building for many of the Klondikers. As with boat building, knowledge of rigging would have been transferred amongst Klondikers at the boat building centers through such means as observation and imitation.

There is no indication that leeboards were used. American small craft used centerboards extensively, especially after 1850, but that leeboards were never popular, and largely relegated to pram-class vessels (Chapelle 1951). The apparent lack of leeboard use by the Klondikers might be partially explained by the general lack of leeboard use in American small craft. Additionally, Klondikers also would only have needed to sail on the lakes and not the rivers. The effect of the katabatic winds would mostly see the vessels with the wind at their backs and not on the beam; in which case a leeboard to provide lateral resistance would not be necessary.

8.3 Watercraft as an Expression of Adaptation

The Klondike Gold Rush was a short-lived event that occurred in waves, and the successive waves occurred while capitalization and industrialization were increasing in the region.

Therefore, adaptation was not necessarily linear, but was responsive to many factors. It is important to keep these things in mind when viewing the Klondike Gold Rush within a three-stage model of adaptation. The vernacular watercraft can be viewed as the behavioral variants of the Klondikers, with differential reproduction of watercraft they deemed best suited to the natural and economic environment. Adaptation is a process; therefore we would expect to see change over time. The historical and archaeological records are indicators of this change.

There are two elements of the pre-adapted stage of gold rush watercraft. One element entails the manufactured knockdown boats and canoes that Klondikers brought with them. The other element includes the materials that were brought in order to build a boat along the Chilkoot Trail. Whether or not Klondikers actually knew how to build a boat, or planned on doing the building themselves, many planned for the event by bringing rope, oakum, pitch, nails, tools, canvas, and hardware. Some may have even planned their boat's design prior to arriving at the boat building centers, and brought along the amount of building materials necessary to construct their vessel.

Several manufactured boats have been located at the alpine lakes, but none have been located further along the trail. This suggests that these vessels were deemed suitable for use at the alpine lakes, and possibly in the ferry system, but not deemed suitable for the trip to the gold fields. This is not to say that manufactured craft were not taken to the gold fields. Approximately 4% of the total registered and recorded vessels that entered the Yukon between 1898-1900 were canoes and canvas boats. However, it appears that more manufactured boats were intended for use to the gold fields than were actually used.

In the second "trial and error" stage of adaptation, gold seekers implemented various coping strategies to solve problems associated with water transport. Commercial boat builders, both the free-lancing individual and the sawmills, were operating at Lakes Lindeman and Bennett as early as 1896. Coping strategies included purchasing, trading, and bartering with sawmills and commercial boat builders for boats, offering goods and services in exchange for a share in a boat, obtaining advice from fellow Klondikers, and forming partnerships with other gold seekers to share resources and labor. Partnerships sometimes formed prior to a group even

setting out for the Klondike, however, many partnerships were formed along the trail in the months it took to reach the boat building centers. Forming partnerships can be seen as forming communities, and relationships, however itinerant they might be.

Behavioral variability increased in the second stage of colonization the Klondikers experimented with new ways of doing things. The archaeological record indicates that various types of vessels were used in the ferry system. Ferrymen might have operated a boat themselves, but had other, smaller boats that they hired out for those willing to row their own outfits across the lakes. At the boat building centers, some gold seekers built multiple boats to accommodate their large parties. It would be easiest for gold seekers to build a “stock” boat and reproduce it as many times as needed. This was certainly done, and is evidenced in the historical and photographic record. The historical record also shows that during this “trial and error” stage, boats built by one party were sometimes different in style and size. There are a variety of reasons why a party would build several types of boats; the smaller boat might be a tender, available boat building resources might only allow for a smaller boat, or gold seekers might have been experimenting with boat design. Whatever the reason, there is evidence for an increase in behavioral variability during the second stage of adaptation.

In the third stage of colonization, the vernacular watercraft was adapted to best suit the natural and economic environment. It did not take long for Klondikers to begin building pram-class and bateau-class vessels once they reached the boat building centers. The transmission of skills and knowledge within the boat building centers can be seen in the similarities in construction styles of the gold rush vessels. Perhaps a small portion of the 30,000-40,000 people who entered the Yukon from the Chilkoot and White Pass routes had previous boat building experience. The majority of gold seekers would likely not have known how to construct a vessel but could witness others endeavoring to build boats at Lakes Lindeman and Bennett. Those who reached the boat building centers early enough in the summer of 1897 had time to build a boat and leave for the gold fields before the lakes and rivers froze. Those who reached the boat building centers in the fall or winter of 1897 had to wait until the end of May in 1898 before they could set off on their journey. Thousands of people wintered over at the boat building centers and would have seen or have heard of the success or failure of those who were leaving as they arrived. Latecomers could replicate proven examples of earlier boats.

Watercraft were also closely tied the economic factors. Bateau-class vessels were extensively used in the first year of the gold rush, but that the ensuing two years saw an increase in the importance of scows. The White Pass Rail from Skagway to Lake Bennett was completed in July of 1899, at which point large numbers of livestock could be taken over the White Pass by rail and put onto scows for transport to the gold fields. In 1898, the NWMP registered 67% of all the vessels entering the Yukon as “boat” and 20% of the vessels as “scow.” In the following year this proportion changed, with 42% of the vessels registered as boats and 47% registered as scows. In 1900, 44% of the vessels were boats and 50% were scows. Successful adaptations in 1899 and 1900 meant building vessels that could take large amounts of commodities to the gold fields.

8.4 Future Finds

It is difficult to fully interpret gold rush vernacular watercraft from the scant archaeological material available. A reappraisal of the vessel remains found by Waddell and Easton has the potential to yield more information about the gold rush watercraft and hopefully the gold seekers themselves. The remains of several vessels are submerged in the cold, fresh water of the alpine lakes at depths that might protect them from ice scouring. It is reasonable to assume that these wrecks would still be in fairly good condition and could be re-measured and reassessed. In addition, identifying areas around Dawson that might yield boat remains and carrying out surveys there might produce more remains for future study.

A standardized reporting system should be employed if vessels are to be reappraised or if additional vessels are found. Additionally, it would be beneficial to undertake such an assessment within the framework of a riverine cultural landscape to help assess shore based infrastructure and remains that might be associated with the boat building centers. Wilde-Ramsing stresses the need for field and historical documentation in small craft studies noting that if a “boat’s origin, period of use, and function are not understood, then its importance will not be understood either” (1989:73, 74). He outlines eight areas of archaeological assessment that at a minimum must be recorded, these include: 1) overall dimensions and hull shape, 2) identification of material used for planks, frames, and keel, 3) arrangement of any deck structures, mast location, or other equipment, 4) a plan view of the framing, 5) documentation of the transverse section at amidships, 6) Description and sampling of fastenings and associated artifacts for

dating purposes, 7) environmental data, and 8) associated sites in the vicinity (Wilde-Ramsing 1989:74). Along with these basic elements, several other items should be noted in any future archaeological endeavors concerning gold rush vessels.

Determining a basic typology is important for evaluating variations between vessels. Ascertaining a vessel's hull shape and overall dimensions of any future finds of gold rush boats could be difficult due to the lack of a complete boat. However, speculation on the shape could come from plank ends, transverse frame dimensions, or thwarts. If possible, it should be noted if the vessel had any bottom rocker. Noting the number of planks per side could help give an indication of overall dimensions, even where planks are obviously missing.

It is likely that most vessels were built out of local spruce and pine but the timber used for planks and frames should be identified nonetheless as it is possible that wood was imported for boat building. Plank width, thickness and length should be noted, as well as any obvious discrepancies. Plank width could indicate the relative age of a vessel, based on Klondiker accounts that indicate a change in plank width between 1897 and 1898. Variability in plank thickness might indicate whether the lumber was milled or whipsawed. This might also be evidenced through tool marks. Sawmills are known to have built and sold boats, milled logs in exchange for a share of the lumber, and possibly sold lumber outright. However, the extent of the involvement of sawmills at the boat building centers is not known. Having a better indication of the prevalence of milled and whipsawed lumber could help to answer this question.

Structural elements, such as longitudinal stringers, gunwales, or inwales, transverse frames, quarter knees, thwart knees, or breasthooks, and their dimensions and qualities, such as if knees are grown or cut, should be noted. The presence or absence of these structural elements might help determine the boat builder's knowledge, and possibly indicate if a professional builder built the boat. Even frame spacing might also indicate a professional builder. In the case of scow remains, evidence of a railing might indicate a freight scow, possibly from 1899 or 1900.

The Boat Building Centers

Archaeological evidence possibly related to boat building at Lake Lindeman includes the five posts scattered around the Lake Lindeman site that did not seem to be related to any particular feature, such as the tent platforms, and the 75 rock piles that either had posts in the center or

were hollow in the center. Vickers (1978) suspected that the rock piles with central holes were at one time supports for posts but he did not conclude their function or the function of the five posts that were unrelated to tent platforms. Klondiker narratives describe Lindeman as a hub of boat building activity with many whipsaw pits erected and many boats built there. It is possible that the posts, and the posts surrounded by rock piles functioned as the bases of whipsaw pits, or ad hoc workbenches used for boat construction. A more accurate description of the extent posts at Lake Lindeman, and their relationship to each other might reveal their use.

Vickers states that the rock piles at Lake Lindeman might be a result of clearing the land for tent platforms or had a “more obscure function” (1978:4). It is possible that some of the rock piles could be associated with boat building. The archival photographs suggest that many of the gold seekers’ boats had moderate bottom rocker. Obtaining bottom rocker may have been done using rocks to weigh down the center of the boat’s bottom, while using poles to shore up the ends. Again, better recording of the rock piles and their relationship to other features, such as the posts might help substantiate or disprove this idea.

At Lake Bennett, cultural remains associated with watercraft appear to be largely related to the commercial enterprises and not to the vernacular watercraft. Sternwheelers built at Lake Bennett were used to transport goods and people between Bennett and the upper Yukon River. The Bennett Lake and Klondyke Navigation Company had several sternwheelers carried over White Pass in pieces and then assembled at Bennett City (Friesen 1978). Several shipping companies built docks and warehouses at the mouth of One Mile River (Neufeld 1993). The remains of a jetty and possible slipway at Bennett could be associated with sternwheeler traffic, or are possibly associated with the commercial scow building operations. Figure 17 shows three scows that appear to be slipped at a jetty just off of the shore in Bennett. This could be the same jetty and slipway structure, or a similar structure to that found by both Vickers and Waddell.

A reassessment of the boat building centers could also aid in better understanding of gold rush watercraft. Viewing the boat building centers as part of a riverine cultural landscape in future underwater and land-based assessments could help in identifying and interpreting features such as stone piles, wooden posts, and jetties.

IX

Conclusion

North American small watercraft is an underused class of artifact, even though small boats “are legitimate bearers of valuable historical and cultural information” (Peterson 1989:59). Previous studies of the Klondike Gold Rush have been land-based in focus, with minimal explanation of the gold seekers’ watercraft, and their role and importance in facilitating the mass migration to the Klondike gold fields. This study has shown that the majority of the gold rush vessels were intentional products, built by the Klondikers at Lakes Lindeman and Bennett, and that these vessels illustrate ways in which gold seekers interacted with the environment and each other.

Previous descriptions of the vernacular watercraft built and used by gold seekers along the Chilkoot Trail have been limited and inaccurate. In contrast to Berton’s (1958) analysis that the gold rush flotilla was “bizarre,” and comprised of a myriad of vessel types, this thesis has demonstrated that while the individual gold rush vessels exhibited diversity, when viewed as a whole, they show uniformity in type and features. Environment, available materials, economic factors, and the builder’s level of skill and knowledge, will influence the design and construction of any boat, and certainly influenced gold rush vessels. Predominant vessel types were of the pram and bateau-classes, which are flat-bottomed and suitable to a riverine environment. Gold rush vessels were built out of local timbers, using both carvel and lapstrake techniques. Characteristic construction features include the use of both hand-hewn and milled lumber, wire nails, longitudinal structures, wooden thole pins, raised wooden steering crutches or transom cut sculling notches, and masts in the forward third of the boat.

This study has illustrated how 30,000-40,000 people, many without boat building knowledge and skills, quickly adapted successful strategies that enabled them to produce watercraft that was both an environmental and economic fit. Boat building and boat usage skills and knowledge were rapidly transferred at the boat building centers likely through methods such as observation and imitation. Coping strategies, such as forming boat building cooperatives, and fostering partnerships with other gold seekers, were instrumental in the Klondikers’ process of adaptation. Gold seekers’ pre-adapted behavior saw many of them take manufactured boat north, then discard these in favor of watercraft that they deemed to be “fittest” for their environment. In

the first year of the gold rush the definition of boat type “fitness” was based around the natural environment, the majority of the vessels were bateaux and flat-bottomed skiffs, with moderate bottom rocker. They had ample cargo capacity, rowing and sailing capabilities, and were maneuverable in shoal waters. Subsequent years saw a boat’s “fitness” expand in definition to include the economic environment as well. The differential reproduction of scows is evidence of this. Scows were still suitable as shoal water vessels, but their cargo capacity was significantly greater than the smaller bateau-class vessels.

This thesis has aimed not only to provide a more accurate assessment of the gold rush vernacular watercraft, but also to discuss features of the vessels that could aid in identification and interpretation of any future finds. Previous archaeological assessments are lacking in sufficient data regarding vernacular watercraft, and associated artifacts and features at the boat building centers. Perhaps it is the residual effect of the Turner thesis that has seen studies of the Klondike Gold Rush remain within a land-based perspective. However, lake and river landscape was a central feature in the lives of gold seekers during their migration to the gold fields. Westerdahl has defined the maritime cultural landscape as signifying “human utilization (economy) of maritime space by boat: settlement, fishing, hunting, shipping and its attendant subcultures, such as pilotage, lighthouse and sea mark maintenance” (1992:5). The inland lake and river system used by the Klondikers to reach the gold fields is a riverine cultural landscape, with its own attendant subcultures and features; the ferry system at the alpine lakes, the boat building centers at Lakes Lindeman and Bennett, the commercial sawmills and boatyards, the pilotage and portaging systems at the Miles Canyon and White Horse Rapids, the landing places of gold rush travelers, the Klondiker grave sites along the waterways, and the navigational markers. Future endeavors on gold rush water transportation should aim to provide more complete documentation of the known vessel remains, as well as investigate aspects of the riverine cultural landscape of the Klondike Gold Rush.

X

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XI

Appendix

Table 3. Supplies for one man for one year. Adney 1994.

8 sacks Flour (50 lbs. each)	1 each Tea and Tablespoon
150 lbs. Bacon	1 14-in. Granite Spoon
150 lbs Split Pease	1 Tape-Measure
100 lbs. Beans	1 11/2-in. Chisel
25 lbs. Evaporated Apples	10 lbs. Oakum
25 lbs. Evaporated Peaches	10 lbs. Pitch
25 lbs. Apricots	5 lbs. 20d. Nails
25 lbs. Butter	5 lbs. 10d. Nails
100 lbs. Granulated Sugar	6 lbs. 6d Nails
1 1/2 doz. Condensed Milk	200 feet 5/8-in. Rope
15 lbs. Coffee	1 Single Block
10 lbs. Tea	1 Solder Outfit
1 lb. Pepper	1 14-qt. Galvanized Pail
10 lbs. Salt	1 Granite Saucepan
8 lbs. Baking Powder	3 lbs. Candlewick
40 lbs Rolled Oats	1 Compass
2 doz. Yeast Cakes	1 Miner's Candlestick
1/2 doz. 4-oz. Beef Extract	6 Towels
5 bars Castile Soap	1 Axe-Handle
6 bars Tar Soap	1 Axe-Stone
1 Tin Matches	1 Emery-Stone
1 gal. Vinegar	1 Sheet-Iron Stove
1 box Candles	1 Tent
1 Hand-Saw	25 lbs Evaporated Potatoes
1 Jack Plane	25 lbs. Rice
1 Brace	25 Canvas Sacks
4 Bits, assorted 3/16 to 1 in.	1 Wash Basin
1 8-in. Mill File	1 Medicine Chest
1 6-in. Mill File	1 Rubber Sheet
1 Broad Hatchet	1 set Pack Straps
1 2-qt. Galvanized Coffee Pot	1 Pick
1 Fry-Pan	1 Handle
1 Package Rivets	1 Drift Pick
1 Draw Knife, Granite	1 Handle
3 Covered Pails, 4, 6, and 8 qt.	1 Shovel
1 Pie-Plate	1 Gold Pan
1 Knife and Fork	1 Axe
1 Granite Cup	1 Whip-Saw