3.7 River Navigation

3.7.1 Affected Environment

The Kenai River is approximately 82 river miles long in its entirety, as measured from its mouth at Cook Inlet (River Mile [RM] 0) to its origin at the outlet of Kenai Lake (RM 82). See Map 3.7-1. The Kenai River flows freely and is considered navigable along its entire length. The 17 miles of river between Kenai Lake and Skilak Lake is known as the "upper Kenai," where the river is largely confined in a narrow glacial valley about 1–2 miles wide. The Sterling Highway Milepost (MP) 45–60 project area encompasses approximately 12 miles of the upper Kenai River from approximately RM 70 at Jim's Landing and Skilak Lake Road to RM 82 at the Kenai River Bridge at Cooper Landing. Within the project area, two bridges cross the Kenai River: the Cooper Landing Bridge at MP 47.8 and the Schooner Bend Bridge at MP 53. There are no other bridges located along the upper Kenai River. The Russian River Ferry operates to cross the Kenai River at the confluence of the Russian River, near MP 55, and uses a cable suspended over the river for guidance.

The U.S. Coast Guard (USCG) administers a Bridge Program to protect river navigation by ensuring bridge clearances are adequate on navigable rivers. USCG requires a Navigation Evaluation as part of securing a Section 9 Bridge Permit (Section 9 of the Rivers and Harbors Act) for new or replacement bridges across navigable waterways.

3.7.1.1 Existing Bridge Structures

The Cooper Landing Bridge was constructed in 1965 and is 401 feet long and 35 feet wide, with a sidewalk approximately 4 feet wide that was retrofitted onto the bridge on the downstream side. The structure is a five-span bridge with four piers located in the river. The current navigational opening per span is approximately 79 feet wide by 12 feet high, based on estimated high water level. The Schooner Bend Bridge was built in the 1960s. The structure has four 70-foot spans and is approximately 280 feet long and 30 feet wide. There are three bridge piers in the river, and each span has an approximate navigational opening of 70 feet wide by 20 feet high. The Russian River Ferry runs on a single guidance cable suspended above the river. The cable is estimate to dip to within 12–15 feet of the river surface.

Navigational information was not gathered for bridges located on the middle and lower sections of the Kenai River below Skilak Lake. The upper Kenai River is sufficiently removed from the other river segments—both in terms of management prescriptions and geographic position (i.e., separated by Skilak Lake, including the rapids immediately upstream from the lake)—that navigation from the river mouth upstream through the project area to Kenai Lake is not known to occur. The upper Kenai River is primarily a drift-only section of the Kenai River Special Management Area (KRSMA) and therefore results in downstream, non-motorized boat traffic only.

3.7.1.2 Boat Type, Size, and Distribution

Much of the upper Kenai River has been designated "non-motorized," with limitations on vessel types and sizes to limit the wake impact on stream bank habitat, reduce motorized/non-motorized user conflicts, and create a quality recreational experience for rafting, canoeing, kayaking,

fishing from boats and from the bank, and other non-motorized uses. The most common boat types found within the project area are hard-sided drift boats and inflatable rafts. Although less common, kayaks and canoes also use the upper Kenai River.

Operating a boat by use of a motor is prohibited year round on the upper Kenai River, from RM 80.7 (near the Princess Lodge in Cooper Landing) downstream to Skilak Lake (ADF&G 2014d). Motor use is permitted within the 1.3-mile stretch from RM 80.7 to the Kenai Lake outlet (RM 82); however, it is a no-wake area, and speed is restricted to 5 mph. While there are no size or horsepower limitations on motorized boats on Kenai and Skilak lakes and the 1.3-mile river section between the lake outlet and RM 80.7 as there are on all other sections of KRSMA, motorized boats must have a four-stroke motor or a direct fuel injection (DNR 2008a).

Specific information on typical vessel draft (height below water) or air draft (height above water) of boats operating within the project area is not readily available. However, the *Kenai River Supplement to the Alaska Boater's Handbook* (DNR 2008b) recommends that boats operating on the Kenai River should be shallow draft, low-sided, and flat-bottomed, and the typical drift boats, rafts, canoes, and kayaks on the upper Kenai River match this general description. Typical drift boats and rafts are less than 18 feet long with a beam of less than 8 feet. The Russian River Ferry is a small, rectangular barge tethered to a cable suspended across the Kenai River. The vessel is non-motorized, operating by the force of the river current, and is dedicated to crossing along the cable only.

3.7.1.3 River Use and Accessibility

Nearly all boating traffic within the project area is recreation-based but includes many permitted commercial operators who run guided float trips for sport fishing and whitewater recreation. The upper Kenai River offers outstanding sport fishing opportunities as well as a scenic landscape, both of which contribute to the river's heavy use. A 2004 Kenai National Wildlife Refuge (KNWR) study estimated the boat traffic accessing the upper Kenai River during a typical summer season at 6,963 boats and 24,941 people (West, personal communication 2006). Boat-based angling and scenic floats represent the major river user groups and the majority of boat traffic within the project area. More information on recreational river use (including commercial river use) can be found in Section 3.8.1.2, Water-Based Recreation Resources, and in the *Recreation Analysis* (HDR and USKH 2013).

The upper Kenai River has limited points of public entry, with one direction of travel. Boating access within the project area is provided at three main access points as described in Table 3.7-1 and shown on Map 3.7-1. The confluence of the Russian and Kenai rivers is one of the most congested areas on the river system. The Russian River Ferry is an important recreational feature within the project area where anglers can be transported across the river at RM 73.5 to access the opposite bank of the Kenai River as well as the confluence of the Russian and Kenai rivers.

In addition to these public boat launch areas, several riverfront properties on Kenai Lake within a mile of the Cooper Landing Bridge and along the river downstream for about 2.5 river miles in the vicinity of the Cooper Landing community have their own small docks or boat launching facilities. Based on a count using an aerial photograph, approximately 11 private launch facilities are located on the river and at least 17 upstream. Boats located on the shore are visible in the photo even where no dock or ramp is evident.

Table 3.7-1. Kenai River access and facilities

MP (RM)	Access Point Name	Description
48 (82)	Cooper Landing Boat Launch	This is a popular launch area for Kenai River and Kenai Lake. This State (DNR/ADF&G) facility provides 36 parking spaces, a concrete plank boat ramp, drinking water and toilet facilities, a boardwalk and viewing platform, an interpretive kiosk, and a volunteer host cabin.
54.9 (73.5)	Kenai-Russian River Ferry and Sportsman's Landing Boat Launch	This National Wildlife Refuge fee area with ferry concession provides paved parking for 75 vehicles, 30 trailers, and RVs. It is a major non-motorized boat launch area. Restrooms and river/bear viewing facilities are provided. This is a major fishing destination at the confluence of the Russian and Kenai rivers.
58 (69.5)	Jim's Landing	This U.S. Fish and Wildlife Service launch is the most widely used boat take-out point (Class II/III whitewater rapids exist downstream prior to the next takeout). Parking is limited, but there is a graveled, flat launch to the river. A visitor contact station on the Sterling Hwy. provides information about the KNWR and restrooms, as well as overflow parking capacity.

Note: DNR = Alaska Department of Natural Resources; ADF&G = Alaska Department of Fish and Game; RV = recreational vehicle, motorhome.

Kenai Lake bounds the eastern edge of the project area. The lake elevation is approximately 436 feet, and it is 22 miles long, covering 138,000 acres. While the lake is a valuable resource for its recreational opportunities, aesthetics, and fish habitat, it experiences far less boat traffic than the Kenai River. As described above, there are no boat size or horsepower restrictions on Kenai Lake. Boating access on Kenai Lake in and adjacent to the project area is provided at three main access points as described in Table 3.7-2 and shown on Map 3.7-1.

Table 3.7-2. Kenai Lake access and facilities

MP	Access Point Name	Descriptions
44.8	Quartz Creek	This Forest Service Kenai Lake boat launch (no vessel type or horsepower restrictions in the lake) includes 45 camp sites along Kenai Lake.
47.7	Snug Harbor Road	This road off the existing Sterling Highway leads along the south side of Kenai Lake, providing beach and launch access.
48	Cooper Landing Boat Launch	This State of Alaska boat launch just downstream of the Cooper Landing Bridge is a major Kenai River access point for rafts and drift boats for downriver activities, as well as motor boats accessing Kenai Lake and the first mile of the Upper Kenai River (motor use not permitted downstream of RM 80.7, a point near the Kenai Princess Lodge)

Note: hp = horsepower; Forest Service = Forest Service, U.S. Department of Agriculture

3.7.1.4 Waterway Characteristics

The Kenai River within the project area generally flows west. At the western end of the project area, at approximately the junction of the Sterling Highway and Skilak Lake Road, the river direction changes and flows southwest into Skilak Lake. The river width fluctuates throughout the project area from approximately 100 to 500 feet wide. Toward the western edge of the project area, the river becomes more braided and interspersed by islands. These characteristics are illustrated on Map 3.7-1.

The upper Kenai River within the project area is characterized as very cold and relatively fast flowing, with many blind corners and sharp bends. The upper Kenai River is classified as class II and class III whitewater. At Schooner Bend (RM 76), there are class III rapids. Located outside the project area at RM 69–67 is the Kenai River Canyon, which includes class II/III rapids. The last take-out before the canyon is Jim's Landing, located at RM 69.5.

River height fluctuations and discharge data were examined for the Kenai River at the U.S. Geological Survey (USGS) water gage (USGS 15258000) located at Cooper Landing. This USGS river gage is the only gage located within the project area. A monthly average extending back 10 years (2002 to 2012) was gathered to document typical flow regimes and is presented in Figure 3.7-1. Gage height records over the past 5 years (refer to Figure 3.7-2) show a river depth fluctuation between approximately 5 feet and 12 feet, with occasional flood stages surpassing the 13-foot mark. Within the project area downstream of the gage, Juneau Creek and the Russian River both flow into the Kenai River, which would result in higher discharges at the western end of the project area.

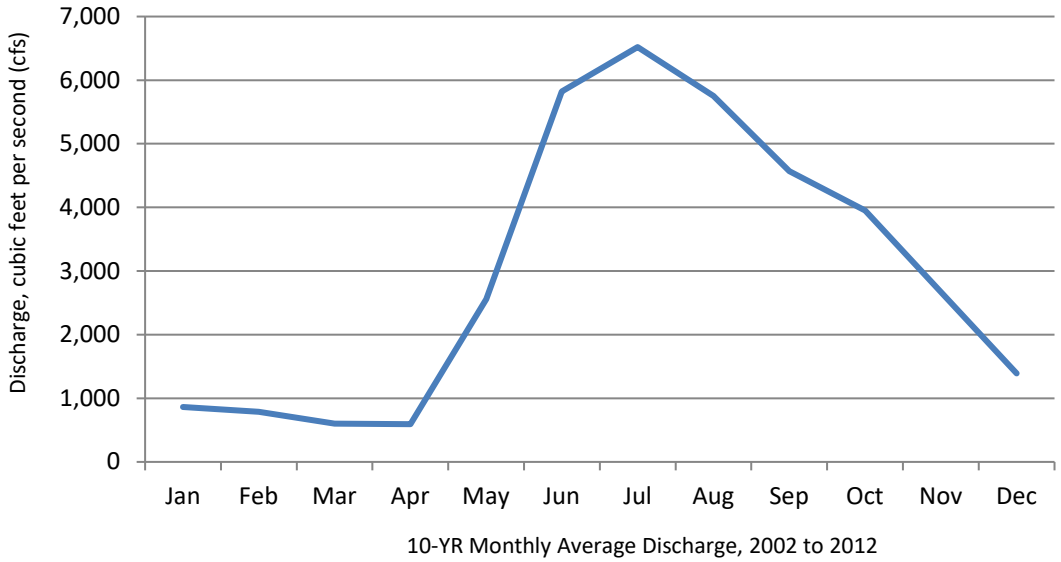

Figure 3.7-1. 10-Year monthly average discharge rate (cfs) for the Kenai River at Cooper Landing

Source: USGS (2013).

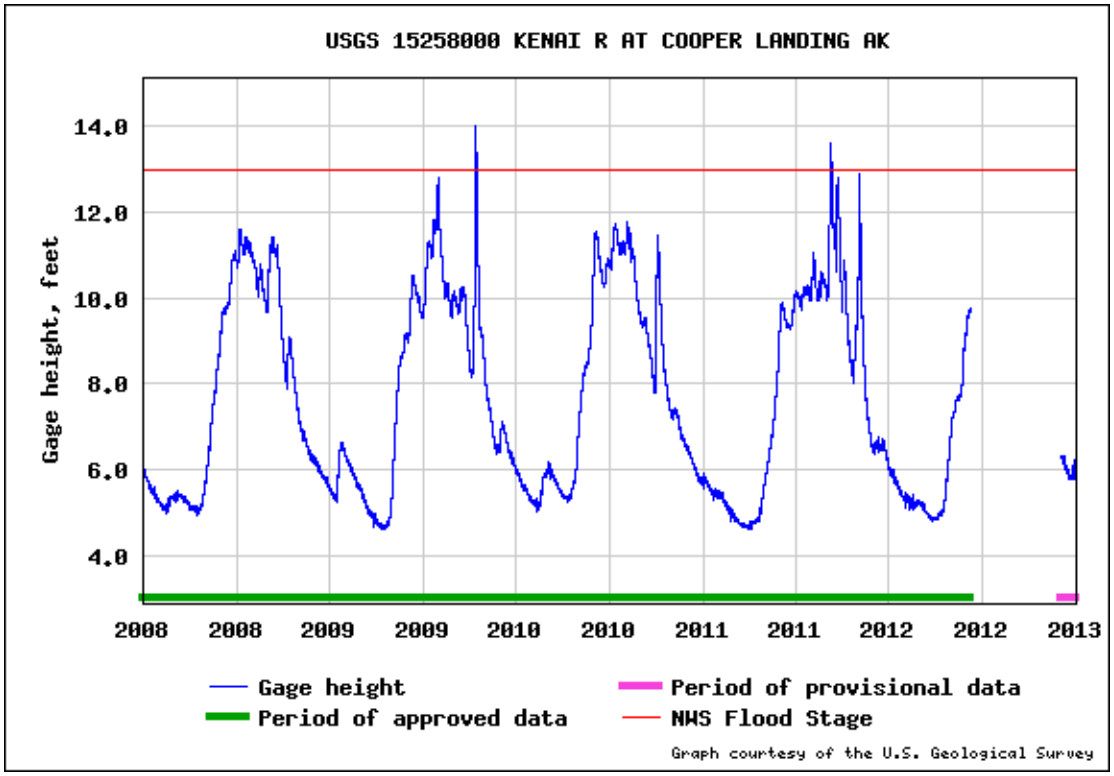

Figure 3.7-2. Gage height fluctuations for the Kenai River at Cooper Landing, 2008–2013

3.7.1.5 Boating Accident Data

Historical data on boating accidents occurring on the Kenai River over the past 10 years were provided by the Alaska Department of Natural Resources (DNR) Office of Boating Safety (DNR 2013). The data provided represented all reported accidents occurring on the entire 82-mile-long Kenai River over the 10-year period; these data were filtered to included only accidents that occurred within or near the project area as determined by the database location entry. Table 3.7-3 lists the accidents by number of fatalities and number injured. The database results are for only accidents that were voluntarily reported to the State. The actual number of accidents and minor injuries is likely much higher than reported.

Table 3.7-3. River accidents occurring near the project area, 2004–2013

Accident Date	Accident State Case No.	Location	# Fatalities	# Injured
2004	N/A	Near Cooper Landing	1	0
8/14/2006	AK-2006-0053	Jim's Landing above Skilak Lake on the Kenai River	0	0
6/28/2008	AK-2008-0030	Two miles upstream from Skilak Lake near Jim's Landing on the Kenai River	1	0
8/24/2008	AK-2008-0065	Below Sportsman's Lodge on the Kenai River, Cooper Landing	0	1
7/25/2009	AK-2009-0021	Upper Kenai River	0	0
7/5/2010	N/A	Kenai Peninsula	0	0

Source: DNR (2013).

3.7.2 Environmental Consequences

This section is applicable only to the navigable waterways within the project area: the upper Kenai River and Kenai Lake near Cooper Landing. This section addresses the potential permanent impacts to river navigation resulting from implementation of the project alternatives. Effects to river navigation would occur during construction of Kenai River bridges; see Section 3.7.2.2 below, for construction impacts and proposed mitigation applicable to both the Cooper Creek Alternative and the G South Alternative.

3.7.2.1 No Build Alternative

Direct and Indirect Impacts

Under the No Build Alternative, there would be no changes to the existing conditions impacting river navigation. Temporary impacts to navigation may occur in association with planned routine replacements of the Cooper Landing and Schooner Bend bridges, anticipated by 2043. See Section 3.27.5.6 (Cumulative Impacts) for this discussion. It is assumed there would be no permanent impacts to river navigation on the Kenai River.

3.7.2.2 Cooper Creek Alternative

Direct and Indirect Impacts

Improvements under the Cooper Creek Alternative would require the replacement of two existing bridges: the Cooper Landing Bridge (at MP 47.8) and the Schooner Bend Bridge (at MP 53). The proposed bridge structures to be built would not result in any permanent impacts to river navigation. Navigational openings (i.e., vertical and horizontal clearances) of the proposed new bridge structures would be sized similarly to the existing openings and would not impede river navigability or boater safety differently than the existing bridges. Pier placement and number of piers for the replacement bridges would be similar to existing conditions.

Because the navigational openings for all proposed bridge structures would perpetuate or improve upon existing conditions, no impact is anticipated to vessels on the waterway engaged in recreational, commercial, or emergency operations within the project area. Under the Cooper Creek Alternative, the proposed bridges would have no effect on river-based commerce, economic growth and development, or critical infrastructure within the project area or downstream.

Construction Impacts

Bridge construction would impact river navigation through full or partial temporary closures of the river channel to boating in the vicinity of the bridges. Closures would occur for safety likely during placement of pilings (pile driving) and placement of long bridge girders or other large bridge components by crane. Depending on the work underway, closures may be to half the river or the whole river. Impacts to river navigation would be short term and temporary, and limited to the period of time when equipment, workers, and temporary structures would be located in the river. For each bridge, it would likely take two seasons to build the bridge and remove any existing bridge (construction of the two bridges could occur simultaneously).

Mitigation

The following mitigation measures and commitments are proposed to reduce impacts to river navigation. Direct and indirect impacts are discussed above. See Section 3.8.2 (in Park and Recreation Resources) for additional mitigation measures and commitments for impacts to river access sites.

The number of piers used for each replacement bridge would be the same or fewer than the existing bridges. To avoid navigational hazards, no part of either of the old bridges would be left in the river, unless, for the Cooper Landing Bridge, it was incorporated into the new bridge design.

Example of temporary navigation closure.

Pilings used to support the spans of temporary construction bridges at each bridge construction site would be placed to allow for continued navigation of the river, and sufficient vertical clearance would be provided at the temporary bridges for ease of navigation.

A Kenai River closure and navigation control plan would be prepared for construction of bridges over the Kenai River, with the intent to minimize disruption to boaters. The navigational control plan would address partial, full, and potential emergency river closures needed for safety when installing bridges over the river. The navigation plan also would address public notification requirements. Complete closures would be minimized to the extent practicable. Complete closures could last as long as 8-hour shifts and may be required during pile driving or bridge girder placement. Complete closures would be minimized during the summer boating and fishing season, and complete closures during this time would be scheduled at night when possible.

The Kenai River closure and navigation control plan and anticipated closure schedule would be developed a year ahead of implementation, to give notice to commercial river guides for planning the following season. Notice of intent to close the river in the vicinity of construction would be given to permitted river guides and area land managers well ahead of actual closure; would be published in Anchorage and Kenai Peninsula newspapers; and would be posted at area campgrounds, boat ramps, and public buildings. The closure and navigation control plan would be written in cooperation with USCG, DNR, and (for fish habitat issues) ADF&G. It would include, but would not be limited to, the following measures:

- Closing only one side of the Kenai River at a time, using a buoy line with information posted on the buoys and at boat launch ramps, alerting users of partial closure.
- Avoiding complete closures of Kenai River navigation from approximately June 15 to August 15 and avoiding complete closures to the extent practical until November 1.

- Ensuring a motorized emergency response boat would be available on site, with qualified operators, at all times during active construction to inform Kenai River users of closures and assist boaters to shore if necessary.

During bridge construction, there is an additional risk to navigation associated with the dropping of tools or materials into the river or onto boaters. This would be reduced by such measures as hanging a net below the work areas. Impacts to navigation also could result from remnant bridge parts associated with bridge replacement. All replaced bridge parts and any temporary construction piers and materials would be removed, and piers not that could not be removed would be cut off below the streambed.

3.7.2.3 G South Alternative

Direct and Indirect Impacts

The G South Alternative would require the construction of a new bridge across the Kenai River (near existing MP 51.2) as well as the replacement of the Schooner Bend Bridge (at MP 53). The bridge structures to be built would not result in any substantial permanent impacts to river navigation. Navigational openings (i.e., vertical and horizontal clearances) of the proposed replacement and new bridge structures would be sized at dimensions similar to or larger than the existing openings of the Schooner Bend Bridge. This should provide a navigation and boater safety experience similar to the experience that occurs with the existing bridges.

The new bridge would introduce new navigational obstacles otherwise not present on this section of the river; however, the new bridge would be located in a relatively straight section of river, approximately 0.5 mile downstream from the nearest bend, giving boaters ample time to see and negotiate the structure. The new bridge would be located approximately 4 miles downstream of the Cooper Landing Bridge and 2 miles upstream of the Schooner Bend Bridge, and therefore would not introduce a new hazard in proximity to other existing bridges.

Because the navigational openings for all proposed bridge structures would perpetuate or improve upon existing conditions, no impact is anticipated to vessels on the waterway engaged in recreational, commercial, or emergency operations within the project area. Under the G South Alternative, the proposed bridges would have no effect on river-based commerce, economic growth and development, or critical infrastructure within the project area or downstream.

Construction Impacts

Construction impacts resulting from the G South Alternative would be of the same type as those from the Cooper Creek Alternative, which are described above in Section 3.7.2.2. However, it is likely that river closures and timing restrictions would be of shorter duration for construction of the G South Alternative's new Kenai River Bridge because it would not involve demolition and removal of an existing structure, as would be the case for the Cooper Creek Alternative.

Mitigation

Navigational clearances designed into both the new Kenai River Bridge and the replacement Schooner Bend Bridge would be the same or greater than the clearances that currently exist at the Schooner Bend Bridge.

Other mitigation measures and commitments proposed for the G South Alternative to reduce construction-related impacts to river navigation are identical to those proposed under the Cooper

Creek Alternative (see Section 3.7.2.2 above). Refer to Section 3.8.1 in Park and Recreation Resources for additional mitigation measures and commitments for impacts to river access sites.

3.7.2.4 Juneau Creek and Juneau Creek Variant Alternatives

The Juneau Creek (preferred alternative) and Juneau Creek Variant alternatives would not include any new or replacement structures over any navigable waterways within the project area and, therefore, would have no impact to river navigation.

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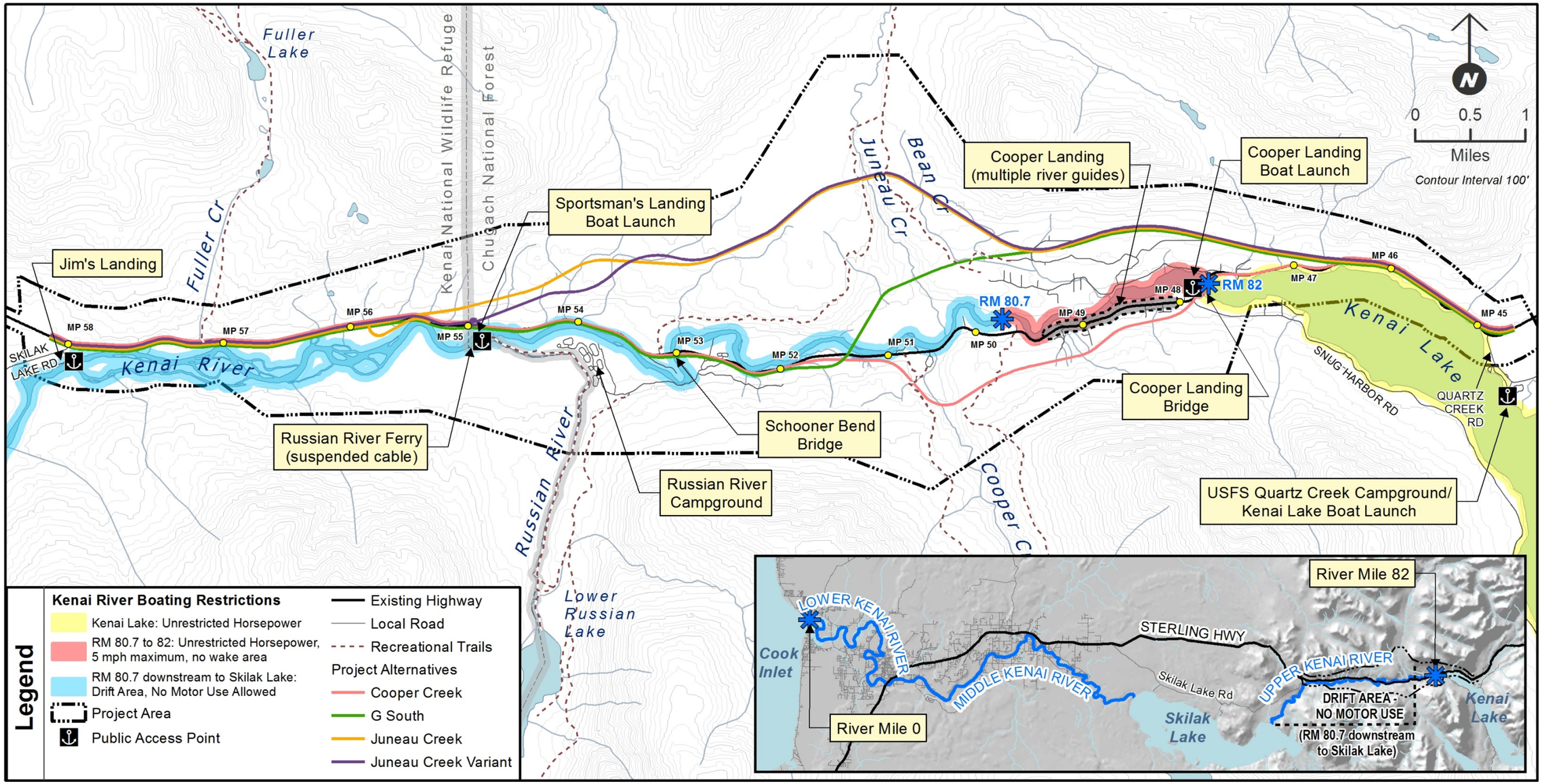

Map 3.7-1. Kenai River and access points in the project area

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