2574

Diag. Cht. No. 6156

Treasury Department,
U. S. COAST AND GEODETIC SURVEY.

O. H. Tittmann
Superintendent.

State: Washington

DESCRIPTIVE REPORT.

Hydrographic Sheet No. 2574

LOCALITY:

Columbia River, Rooster Rock to Multonomah falls

1901

CHIEF OF PARTY:

Fremont Morse

2574

DESCRIPTIVE REPORT to accompany HYDROGRAPHIC SHEET NO. 4, COLUMBIA RIVER.

Hydrographic Sheet No. 4, Columbia River, extends from near Rooster Rock to Multnomah Falls. It is joined by Sheet No. 3, Columbia River, on its west end, and by proposed Sheet No. 5, Columbia River, on its east end.

The general character of the shores of this sheet are bold, rocky hills and cliffs, in many places coming down to the water's edge. The shores are covered with fir and underbrush, and the one island on the sheet, SandIsland, is covered with cottonwoods and willows. Beginning near the western limit of the sheet the shores of the river narrow in and are very rough and broken. Cape Horn is a cliff rising from the water's edge to a height of 185 feet. On the Washington side, above Bridal Veil, the shore rises into hills of from one to two thousand feet in height. This stretch of the river has some of the most grand and picturesque scenery in the world, and its scenery is admired more than any other on the river between Portland and the Dalles.

The greatest depth of water found on the sheet was in the vicinity of Cape Horn, 114½ feet. The most shoal water in the channel was found in the vicinity of Fashion Reef, Opposite Wood ⊙ 16 feet.

The strength of the current varies from one and a half to two miles per hour.

The range of tide is approximately four-tenths of a foot. This tide does not appreciably effect the current of the river at any stage. The plane of reference is that established from observat-

ions by the Corps of Engineers, United States Army, from observations at Vancouver, Washington, and the Locks, Oregon, and from observations by the Party of Fremont Morse, Assistant U. S. Coast and Geodetic Survey, during the year 1900. From these observations the plane was deduced by Mr. Morse.

The width of the river at the lower or west limit of the sheet is 1700 metres at high water and 800 metres at low water. The width at hydrographic station Reef is 1400 metres at high and 400 metres at low water. Width at the east end of Sand Island at high water, 1800 metres, and 370 metres at low water.

The channel abreast of station Out is 250 metres off the Washington shore, running to a point 100 metres off the Oregon shore at Cape Horn. From Cape Horn to the lower end of the sheet the channel is reported to have shifted from near the Washington shore 500 to 600 metres toward the Oregon side of the river.

The bottom through this stretch of the river is sand with some rocky bottom. The rocky bottom is near the beach and is indicated by the outcropping of the rocks above the high water line. At the west end of the sheet, and up to station Reef, the beach is of sand and mud with flats of sand making out from the Washington shore. On the Oregon side from the west limit of the sheet to and above Sand Island there are extensive flats of sand that are bare for a distance of from 150 to 1550 metres from shore during extreme low waters. At station Reef there is a detached rock 50 metres off shore, and from here up to Cape Horn the Washington shore is bold and rocky with an occasional small sand beach.

From Cape Horn to Lone Rock (hydrographic station Lone) the channel is quite narrow and deep, with a strong current which makes close in to the cliffs of Cape Horn. From Cape Horn the channel turns and heads for the point of rocks at Cape Horn Landing, where it is approximately 50 metres off shore. Greatest depth of water found was 114¾ feet; least depth found, 51¼ feet. Current approximately two miles per hour.

The Washington shore is bold, rocky bluffs. At Cape Horn the cliff rises 185 feet from the water. At the bottom of the cliff is a shoulder of rock extending 20 to 30 metres into the stream with 14 to 20 feet of water over it. Outside of this shoulder the water drops to a depth of 80 to 100 feet. The Oregon shore is sand. The water increases rapidly in depth and is 40 to 50 feet deep 100 metres from the low water line.

The high water width of the river through Lone Rock is 1850 metres, with a width of 500 metres at low water. The high water width at station Wood is 1450 metres, with a low water width of 1200 metres. The width at the east limit of the sheet is at high water 1650 metres and 850 metres at low water. The river above Lone spreads out over extensive sand flats on the Oregon side, the water being quite shoal, 4 to 6 feet at low water, for a distance of one and a half miles above Lone Rock and well into mid-river.

The channel keeps near the Washington shore and parallel with it midway between hydrographic stations Wood and Jug, where it turns to the Oregon side, just passing clear of Fashion Reef, and continuing in the same direction until at the upper or east end of the

sheet the channel is 50 to 100 metres from the Oregon side of the river.

From Cape Horn to hydrographic station Or, on the Washington side, the beach is rocky, much broken and rough. The rocks are detached and angular. Between stations Of and White is a large submerged rock about 80 metres off shore and 160 metres above station ~~White~~ Of. This rock has three to five feet of water over it at low water, is 40 by 20 metres in size, and is very sharp, angular, and jagged. It is not in the usual path of steamers. There are several detached rocks along this stretch of the beach that stand well above high water. At station Jug the beach is covered with sharp, angular rocks for a distance of 100 to 150 metres. Above Or and to station Fir the high water bank of the river is rocky and bold, but at low water a sand beach makes well out into the river. From station Fir to the upper limit of the sheet the beach is rocky but generally covered with sand, with the exception of a point of angular rocks that makes out at station Cab. These rocks are covered at the highest stages of the river.

From and above the upper limit of the sheet to abreast of Prindle's Landing is a sand spit that is bare at low water. This spit forms a slough at low water. There is no inlet from the river to this slough (at its upper end FLY). A creek comes into it further up the river. Greatest depth of water found in this slough was 56 feet. There is 13½ feet of water at its lower end. None of the regular steamers use this slough. The cannery steamers and launches use it at the higher stages of water while gathering up fish.

The Oregon shore is sand, mud, and rock. The sand extends from Bridal Veil to near Dalton's Point (station Dal) where there is a stretch of 200 metres covered with loose angular rocks. From above Dalton's Point to Fashion Reef (station Tall) the beach is of mud and quick sand with one large rock at station Rock. This rock is bare at all but the higher stages of water. Fashion Reef makes out from the Washington shore 420 metres and is 230 metres wide. The higher rocks in this reef are awash when the river is at one foot above the plane of reference. Above Fashion Reef the beach is of sand and mud up to near the limits of the sheet, where there is a small gravel bar. Greatest depth of water found on this stretch was 114½ feet, off Cape Horn; the most shoal sounding was 16 feet, below Fashion Reef.

The general character of the bottom of the river on this sheet is sand, with the exception of near the water's edge. There is better water through this stretch of the river than on the stretches below. The most shoal place is over the bar below Fashion Reef. The channel here is approximately 16 feet. By local fishermen it is reported that this bar has shoaled about 15 feet within the last few years. The location of the channel, except at the west or down river end of the sheet, has changed but little, if any.

Mt. Pleasant Landing, on the Washington side of the river, has two wharves. The high water wharf is entirely above, and 50 metres from, the low water line. The low water wharf is to the westward of the high water landing and has 6¼ feet of water alongside at low water.

Cape Horn Landing has a low water wharf with 11¼ feet alongside at low water. The landing at high water is made on the banks of the river to the westward and 10 to 20 metres from the wharf.

Prindle's Landing has a stone crib with no flooring over it for low water landing. At high water, landings can be made on the bank. There is 4 feet of water alongside the crib. Steamers generally decline to make the landing.

It is reported that steamers land at Bridal Veil, Oregon. There are no facilities for landings, and they can only be made at extreme high water as Bridal Veil is 800 metres from the low water line of the river.

Fashion Reef, so called from the fact that the steamer Fashion was wrecked here, makes out from the Washington shore at hydrographic station Tall. Its width is 230 metres, extending out into the river 420 metres. Its northern or off shore end is marked with a spar buoy set in 14 feet of water. Many of the rocks in this reef are out at low water, being about one to three feet above the plane of reference. The rocks on this reef are angular with rough and jagged edges. The current over the reef, with two to three feet of water over it, is one to one and a half miles per hour. The main current of the river sets off shore from just above this reef, the current making an angle with the axis of the reef of 30°. This may, and probably does, change with the different stages of water in the river.

The Columbia River is the water way for the commerce of a large portion of the states of Oregon, Washington, and Idaho, grain, hay,

fruit and other commerce being transported by steamer to Portland, Oregon, the seaport for foreign trade for this vicinity.

Between Portland and the Dalles two lines of steamers are operated. The Regulator Line runs a steamer each way daily, except Sundays, throughout the year, with an auxiliary steamer making tri-weekly trips between Portland and the Locks. These steamers make all way landings. The White Collar Line operates a steamer which leaves Portland, running to the Dalles and returning the same day, daily, except Mondays, during the tourist season. This steamer makes no landing between Portland and the Locks. During the winter season this steamer makes a trip every other day each way, making all way landings.

Prevailing winds are from the west, generally light. The most severe wind is from the east. This wind at times is so severe as to materially interfere with steam navigation and to entirely suspend small boat traffic. This east wind carries a great deal of fine sand and dust, which are deposited and materially augment the bars lower down the river. It is claimed that the debris carried by this wind does more toward forming and increasing the bars of the river than does that brought down and deposited by the current of the river. It is seldom that any wind, except either up or down the river, occurs.

Fogs are frequent and heavy during the fall, winter, and spring months. They are formed and augmented by west winds and dispersed by the east winds. During the dry months of July and August, and early September, the smoke from forest fires and burnings from the

clearing of lands is so thick as to seriously interfere with survey work, but it seldom becomes sufficiently dense to interfere with navigation. Ice rarely forms of sufficient thickness to interfere with navigation.

The annual freshet, in the month of June, materially increases the strength of the current, but offers no serious interference to steam navigation. Much debris is carried by these freshets.

The Oregon Railroad and Navigation Company, a part of the Southern Pacific System of Railroads, is operated along the Oregon shore of the river. From the station at Bridal Veil, Oregon, opposite Cape Horn, there is a double daily mail and passenger service to all points, also telephonic and telegraphic communication. There are no mail facilities at either Mt. Pleasant or Prindle's Landings. At Cape Horn there is a tri-weekly mail service through Bridal Veil by small boat. None of the river steamers at present carries mail.

On the extensive flats across the river from Cape Horn and on the sand spit near Prindle's Landing lines of levels were run to indicate their contour and elevation above the plane of reference. No marine or aqueous growths were observed. Wrecks, when not entirely broken up and the parts carried away by the current, speedily become imbedded in the sand and disappear, forming the nucleus of a sand spit.

E. B. Latham,
Assist. U.S. C. & G. Survey