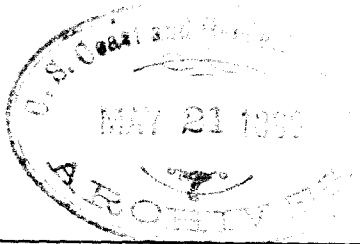


356.



U. S. COAST AND GEODETIC SURVEY.

J. M. Thorn, Superintendent.

State: *California.*

DESCRIPTIVE REPORT.

Topographic^{*} Sheet No. 1816.

LOCALITY:

Mouth of Cell River.

1888.

CHIEF OF PARTY:

George Davidson

** and Hydrographic*

E. G.

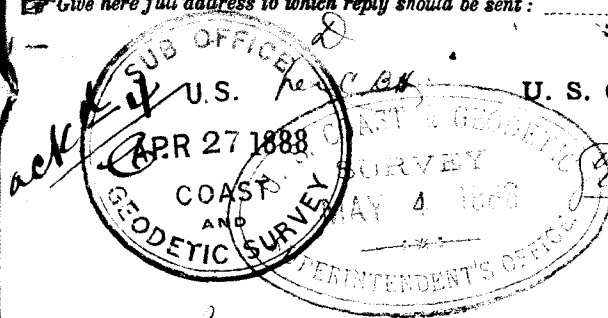
Nov. 6/88

Received and transmitted.

Give here full address to which reply should be sent:

Report 1888

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U. S. Coast and Geodetic Survey,

Sub Office, San Francisco, Cal.

April 25th, 1888.

Mr. G. M. Thorn

Supdt. U. S. Coast & Geodetic Survey

Washington, D. C.

Dear Sir:

In obedience to your instructions to Asst. Progr. Davidson of Feb. 8th, and his instructions to me of Feb. 17th, I proceeded to Humboldt Bay on the steamer which left San Francisco on Feb. 22nd, arrived in Eureka the 23rd, and proceeded to Eureka on the 24th. On the following day I went down Salt River and out over Eel River Bar in the tug Roberts to see what signals were needed and to observe what changes had taken place in and near the entrance to the river since the survey of Asst. Rodgers in 1869-70. I returned to Eureka and wrote a preliminary report to Asst. Davidson, asking for such instruments and projection that were needed to carry out your instructions. While waiting for the instruments I was in leave of absence previously asked for and granted; but as soon as I was informed the instruments had been sent to me, March 10th, I proceeded to Eureka to begin the work.

Several days were spent in searching for the triangulation points of 1869-70, which had nearly all been destroyed. Enough were found, however, to enable me to set the Plane-table in position at two intervisible stations and thereby determine a sufficient number of signals to proceed with the work. The banks of Salt River had been surveyed by Asst. Rodgers only as far as its junction with Centerville Slough, but as Port Kenyon, the present shipping point for this region, is situated nearly two miles further up that river the topography of it was executed up to and beyond Port Kenyon. Owing to the great changes which had taken place at the mouth of Col River it also became necessary to resurvey the whole of Salt River and a considerable distance up Col River proper. A portion of the North and South points of the entrance were also resurveyed. After the topography was completed soundings were obtained on the bar and in the entrance on two days, and one day was spent in sounding out the river to the limit of the topographical survey. During the entire time of this survey, from March 12th to April 3rd, the weather was blustering and unsettled, with southerly winds with showers of rain or cold, north-west gales with fine rain or mist.

Col River is a very long stream and in periods of freshets carries a large body of water to the sea. Its delta extends from Table Bluff, on the north, to the hills back of

Centerville on the South, a distance of eight miles, and reaches inland to the first great bend, some nine or ten miles from the ocean. In times past the river has formed this low land, and its old channels still remain as sloughs. Four of these have entirely dried up but can be readily traced in driving across the country. The principal slough to the Southward of the river is called Salt River. It is connected with Crel River about nine miles from the sea only in periods of freshets, when the waters of the latter river run into it by several small channels too shallow to admit the immense drift-logs and snags which abound in Crel River. Salt River is therefore comparatively deep and free from snags, and offers better facilities for shipping than the main river. Landings have been attempted on Crel River, but the steamers lost their propellers by coming in contact with sunken snags. There are many sloughs to the northward of Crel River, but I have only seen them when driving along the ridge of Table Bluff, and their mouths are shown in Capt. Rodger's survey. I do not know if they are connected with the main river above at any other times than in freshets, but should judge that they were not from the shallow water in the channel inside of the North Spit. Morgans Slough, the next one to Salt River South of the main river, is rapidly filling up, but Eastlake Slough has carried a large body

of water during the late freshets and its southern bank is constantly wearing away. The upper end of Mosley Slough has also been widened by the river, but at low water there is not even a boat passage through its lower end, nor in the new slough which is forming to the southward of it. At the beginning of the flood tide the current runs into these latter sloughs through their upper mouths until the bar flats at their lower mouths are covered.

The waters of the river and sloughs are separated from the ocean by a narrow strip of low sand densely covered with driftwood above high water mark. It rises into sand dunes at three miles to the northward of the southern limit of the river delta, but these dunes are being constantly moved by strong winds. The Δ^2 stations which had been established upon them were as entirely lost as were those which had been located further to the northward on the low parts of the Spit where the seas of winter storms sometimes sweep over. There is a tradition among the Indians living near the mouth of the river that there have been seasons long ago when the river had no opening through this sand barrier, but in the period during which the country has been inhabited by white people there has always been one, and at rare times two openings. The place of opening varies with the season. The Indians say they

have known it to be close under Table Bluff, but during the last thirty-five years it has varied from a little south of its present location to about two miles to the northward. The tendency of the river during freshets, or after the first rains in the fall, is to break straight out opposite its mouth; as the river current becomes less voluminous the South point keeps advancing to the northward; and forcing the North point in the same direction, but with a continually narrowing opening between them. This advance to the northward is no doubt caused in part by the general movement of the sand to the northward by the inshore ebb current, but it is also materially assisted by the shape of the junction of Salt River with Bel River. Salt River is at all times a tidal stream, almost equally active throughout the year, and its ebb current meets the Bel River current at right angles close under the South Point of entrance, thereby tending to prolong the point. During the latter part of my visit there was a considerable volume of water coming out of the river from recent rain storms so that there was no perceptible flood current in the main river, but nevertheless this growing of the South point was going on. When I determined the low water line round the South Point it was almost dangerous to approach the end of the sand as it seemed ready to cave in and a raging current

was flowing past it, but the sand was cast up on the outside and the point was building to the northward. It would seem as if this movement would be counteracted by the issue of the ebb water from the sloughs north of the river and it probably is retarded to a certain extent. The main river has of late years been gradually working to the southward and building up on its north bank, and it is quite probable that when the dividing point between Owl and Salt River has washed away still more, so that their junction takes place at some distance inside the entrance, this will remain more permanent. It is certainly true that the entrance has been more successfully navigated the last two or three years than ever before, only giving trouble in the fall of the year when the river is at its lowest stage.

The people here are earnestly moving for aid from the U. S. Government to improve the navigation of the river. Nothing in my judgment can be done with the sandy points of the entrance; but a series of wingdams might be constructed on the North bank of the river inside to accelerate and make more permanent the present favorable action of the river itself. An obstruction in the upper mouth of Morley Slough and the new slough to the southward might also be useful to prevent the diversion of the ebb-water through them. Drift has now collected at these places in large quantities.

The entire delta of the river has been covered with forests of pine, spruce, and here and there redwood, with alder and willows growing near the water courses. But these forests have been nearly all cleared away, the timber remaining only in bunches. The land is extremely fertile from the frequent overflowing freshets, and the inducements to clear and reclaim land are great. Hence nearly all the small sloughs have been injudiciously dyked across their mouths, and even some of the large sloughs have been stopped up, as for instance the Centerville Slough, which has a dam across it about half a mile to the northward of where Asst. Rodgers had a Steamboat Landing marked in his survey. The dyked sloughs rapidly fill up and thus the tidal area is being decreased and the volume of water flowing in and out through the entrance lessened. There is a movement on foot among the people interested in shipping to check this destructive action and even to compel the removal of some dams already constructed. Before any improvement can be made by the U. S. the entire tidal area of the basin should be ascertained by a survey of all the sloughs and the river itself to head of tide-water. The influence of the tide is felt at a distance of six miles from the mouth on the main river; and Salt River, which is about eight or nine miles long, is entirely a tidal river. It widens out above Port Kenyon and becomes more shallow. About one mile above the Pontoon Bridge shown in the survey

is a fine Iron Bridge across the river, and at one mile still further up the river is fordable, but at high tide the water rises above the bottom boards of the wagons.

This region has made great progress in the last ten or fifteen years. I passed through here in November and December 1872 on my way to and from Cape Mendocino Lt. Ho. I have been astonished during my present visit at the changes in the appearance of the country; then almost a continuous forest with a few farms here and there, now well-built houses and prosperous farms. The town of Ferndale consisted then of but a small number of houses and Port Kenyon was an unbroken forest. Now the two places almost merge into one another. The farms are mainly forty-acre tracts and are principally devoted to dairying. In order to exhibit the amount of produce shipped from this region and its natural resources I will quote here portions of a pamphlet, recently issued by the people of Ferndale and vicinity, which contains statistical information upon this subject.

"Columbia River is the natural outlet to Southern Humboldt, and the importance of the navigation of this river to the people of that section cannot be overestimated. One of the greatest points in its favor is the large amount of money saved to farmers, dairy-men, manufacturers, and shippers in the transportation of their goods, the shipping point being so

convenient and easy of access that freight can be delivered there at all seasons of the year and at short notice. If it were not for the navigation of Eel River the large belt of spruce and pine lying on the Coast Range would be almost worthless as the cost of transportation to other points would be so great as to practically prohibit the manufacture of the same into lumber. If the mouth of Eel River were so improved as to make it a reliable and permanent entrance, it is safe to say that not only the entire product of Southern Humboldt would be shipped that way, but thousands of dollars annually would be saved to producers thereby. For many years various steamers have navigated Eel River, and for the past three years the Steamer "Mary S. Hunt" has made weekly trips between Port Kenyon and San Francisco. The last years business of this little steamer showed an increase in the value of the exports and imports to and from San Francisco of over fifty per cent, demonstrating with what rapidity the resources and industries of this section are being developed. Within the last few months a new and powerful tug has been placed on the river for the purpose of towing sailing vessels in and out over the bar, and already several schooners have taken out cargoes of lumber. + + + + +

The great drawback to Eel River as an outlet is the fact that during one or two months in the fall of the year the bar,

becomes so shallow that safe navigation is practically prohibited."

"The following Marine report shows the amount of lumber shipped over Eel River Bar from January 7th 1888 to February 7th 1888.

	Lumber	Shingles	Cords of Bolts
Jan. 7 th Schooner Chas. J. Wilson	75.000	21.250	
" 18 th Steam Frigate	140.000		25
" 23 Schooner Chas. J. Wilson	80.000	22.000	
" 24 Schooner Amethyst	100.000	20.000	
Feb. 2 Schooner Helen Merriam	100.000	103.000	
" 2 Schooner Berwick	135.000	128.000	
" 2 Steam Frigate	85.000	868.000	
" 7 Steam Frigate	<u>118.000</u>	<u>400.000</u>	
Total	833.000	1.562.250	25 "

This is the one article of lumber only. The annual product of this region may be gathered from the following.

"The items of interest pertaining to Southern Humboldt can be summed up as follows: It has 250.000 acres of redwood timber averaging about 100.000 feet to the acre. Its annual yield or product is about:

Wool, pounds	1.250.000
Butter, pounds	1.500.000
Pork, pounds	800.000
Salmon, tons	1000

Charrer, tons	60
Hay, tons	12.000
Oats, pounds	15.000.000
Peas, pounds	900.000
Barley, pounds	5.000.000
Wheat, pounds	800.000
Rye, pounds	54.000
Lentils, pounds	40.000
Bird seed, pounds	3000
Potatoes, tons	3000
Beef cattle, head	5200
Calves, head	4500
Mutton sheep, head	30.000 "

Allowing for the home consumption of a population estimated at about 8000 there is a considerable surplus for shipment.

The landmarks for making Bel River are Cape Fortunat or False Cape on the South, and Table Bluff on the north. The particular place of entrance through the sand barrier is at present marked by Elley's Fish House, a large wooden building on the South point of the Entrance, and near it a tall double mast with pieces of wood nailed on for steps and surmounted by a tall

top-mast, near the head of which is fastened a large white-painted barrel and a small flag. Abreast of the entrance, and as guides for the channel, are erected on the bare sandy point inside two range-marks made of lumber and white cloth and situated about two hundred yards apart. The back-range is made a little higher and larger than the front range. These marks are being continually moved as the channel changes. On the north gable of Ellerys Fish Ho. on the South Spit is painted a large, square, white mark, and at a distance of about one hundred yards towards the end of the point is a small, white range-mark. These are guides for the North Channel and are also being changed to conform to changes in the channel. These changes are being continually observed from shore by an experienced fisherman and pilot who lives at the mouth of the river, and receives monthly wages from the Roberts Bros. to attend to the ranges. He also acted as tide-observer during this survey.

The opening of the valley, or the river delta, has changed materially in appearance, since I observed it before in 1872 from seaward. Then the forest formed an almost unbroken line across the low land: now the timber only remains in detached bunches. A great many houses are seen on the hills to the southward of the valley, and the timber on these hills

is greatly thinned out. Table Bluff, which had the appearance of a bare, grassy headland, has now a young growth of trees upon it about half a mile in from the extremity of the point. This growth has spread from the fringe of trees which grew along the shore of Humboldt Bay on the north side of Table Bluff.

Steamers and sailing vessels trading to Col River generally wait outside for the tug to come out and pilot them in, and no ship master should attempt to go in without such aid. Nevertheless, during my visit, two schooners sailed in and ran up the river as far as the Cannery and anchored there. They were acquainted with the ranges and the bar was smooth. Col River Bar is better than many other bars on this coast in that it is shorter and located close in. In rough weather the heavy seas break outside of it so that on the bar itself is all broken water. When I went out on the tug the first time, Feb. 25th, the weather was so rough that no towing had been attempted over the Humboldt Bar for three days previously. We crossed the bar of Col River without taking any heavy seas, but outside, in about five fathoms of water a sea went clear over the house of the tug. The shallowest water is found not on the bar but, strangely enough, right in the entrance between the end of the South Spit and the Middle Ground inside. On the

last day of this work, April 3rd, we could not get in there at low water with the tug, but were obliged to recross the bar and wait outside an hour for the tide to rise.

Outside of low water mark along the sand beach south of the mouth of Eel River I observed from the hills breakers in many places about one-quarter of a mile off shore, as if there were ridges of sand forming out there, with deep water near shore. The low water line of this beach is, also, not at all even, but runs out in points in various places. It is, of course, continually changing, so that surveys of the high or low water lines a week apart would not give the same results.

In conclusion I beg leave to say that I have received very material assistance from the Roberts Bros. of Mendota & Port Kenyon in the way of teams, boats, subsistence, and personal services, and much volunteer aid from people living here, without which it would have been very difficult to find some of the stations to begin the work, and its execution would have been more expensive to the Government.

Yours very respectfully
Ferdinand Hestdahl

Draughtsman C. & G. Survey