

NOOKSACK, SKAGIT AND SNOHOMISH RIVERS, WASH-
INGTON.

LETTER

FROM

THE ASSISTANT SECRETARY OF WAR,

TRANSMITTING

A copy of the report of the preliminary examination of the Nooksack,
Skagit and Snohomish rivers, Washington.

DECEMBER 4, 1890.—Referred to the Committee on Rivers and Harbors.

WAR DEPARTMENT,
Washington City, December 4, 1890.

SIR: I have the honor to transmit herewith, in compliance with the provisions of the river and harbor act of September 19, 1890, a letter from the Chief of Engineers, dated the 3d instant, inclosing a copy of a report of Capt. Thomas W. Symons, Corps of Engineers, dated November 8, 1890, upon the preliminary examination of Nooksack, Skagit and Snohomish rivers, Washington.

Very respectfully,

L. A. GRANT,
Assistant Secretary of War.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., December 3, 1890.

SIR: I have the honor to submit the accompanying copy of report dated November 8, 1890, by Capt. Thomas W. Symons, Corps of Engineers, giving results of the preliminary examination of Nooksack, Skagit and Snohomish rivers, Washington, made to comply with provisions of the river and harbor act approved September 19, 1890.

These rivers have been under improvement by the United States since 1882, and appropriations have been made therefor in all the river and harbor acts since that year.

It is the opinion of Captain Symons, concurred in by the Division Engineer, Col. G. H. Mendell, Corps of Engineers, that Nooksack,

2 NOOKSACK, SKAGIT AND SNOHOMISH RIVERS, WASHINGTON.

Skagit and Snohomish rivers are worthy of improvement, and that with an appropriation of \$30,000 everything necessary for their improvement at the present time can be done. All the necessary data in regard to the rivers being at hand, no further survey was deemed necessary. These views meet with my approval.

Very respectfully, your obedient servant,

THOS. LINCOLN CASEY,
Brig. Gen., Chief of Engineers.

Hon. REDFIELD PROCTOR,
Secretary of War.

PRELIMINARY EXAMINATION OF NOOKSACK, SKAGIT AND SNOHOMISH RIVERS, WASHINGTON.

UNITED STATES ENGINEER OFFICE,
Portland, Oregon, November 8, 1890.

GENERAL: I have the honor to state that, in accordance with the terms of your letter of September 20, preliminary examinations have been made of the Nooksack, Skagit and Snohomish rivers.

These rivers are so essentially alike in their characteristics and their needs, and their improvement is so correlated, that it has seemed proper to treat them together in this preliminary report.

In my opinion they are all worthy of improvement.

They all have a considerable commerce now, as shown in the annual reports of the officers in charge of the rivers, and must ever, if kept in navigable condition, exercise a marked influence on railroad rates throughout the country traversed by them.

In 1881 examinations were made of these rivers, and they were reported upon by Maj. G. L. Gillespie (Chief of Engineer's Report, 1881, pages 2603-2616). In furtherance of this report an appropriation was made in 1882 of \$20,000 to build, equip, and operate a snag boat on the river.

There followed an appropriation of \$10,000 in 1884; \$10,000 in 1886; \$15,000 in 1888; and \$12,000 in 1890.

The operation of the snag boat has done a great deal of good on these rivers, but the amount of money available has never been sufficient to enable the boat to do the necessary and desirable work. Snags and stumps are constantly being caught in the river, and forming obstructions themselves and causing the lodging of bowlders and the formation of gravel and sand bars.

In my last annual report I have recommended an appropriation of \$30,000 for the rivers Skagit, Snohomish, Steilaquamish, Nooksack and Snoqualmie for the year 1891-'92. If this money is appropriated, I believe that everything necessary for the improvement of these rivers at the present time can be done. I can see no good to be accomplished by making at the present time any survey of these rivers, as the obstructions which would form the principal data to be gathered by such a survey are constantly changing.

The present and immediately prospective demands of commerce would be satisfied if the snags, jams, and bars could be more efficiently removed than is the case at present, owing to inadequate appropriations.

With the \$30,000 asked for the snag boat could be kept in commission almost constantly when the river stage was favorable, and the gravel and sand bars improved by removing snags and roots and dragging them with a suitably constructed drag.

Explosives could be used freely where the nature of the work required it. The timber on the banks where erosion occurs could be chopped down and cut into sections that would insure its floating out to sea, and some inexpensive bank protection might be provided at a few exposed points.

Serious features connected with the navigation of these Sound rivers are the tide flats at their mouths. Across these flats, which are exposed at low tide, the river water flows at low water in numerous small channels, none of which are sufficient for purposes of navigation. It is necessary to approach the mouths at high or nearly high tide through channels marked by stakes and stake lights.

This is an inconvenience which could be remedied by building training dikes and dredging out channels, which, once opened, would probably be kept open by the currents.

I do not think that the demands of commerce, either present or prospective, would justify the expenditure necessary to make these channels and overcome the inconvenience, and I therefore do not recommend a survey and the preparation of plans and estimates therefor.

The reports of Capt. E. H. Jefferson, who made the preliminary examination, are herewith.

Very respectfully your obedient servant,

THOMAS W. SYMONS,
Captain, Corps of Engineers.

Brig. Gen. THOMAS L. CASEY,
Chief of Engineers U. S. A.

(Through Col. G. H. Mendell, Corps of Engineers, Division Engineer Pacific Division.)

[First indorsement.]

UNITED STATES ENGINEER OFFICE,
San Francisco, Cal., November 18, 1890.

Respectfully forwarded. For reasons herein stated the Nooksack, Skagit and Snohomish rivers are worthy of improvement as recommended by Captain Symons.

G. H. MENDELL,
Colonel, Corps of Engineers,
Division Engineer.

REPORTS OF CAPTAIN E. H. JEFFERSON.

I. NOOKSACK RIVER.

SNOHOMISH, WASH., *October 13, 1890.*

SIR: I have the honor to acknowledge the receipt of your letter of the 4th instant, requesting a report on the Nooksack River, Washington; a description of the river, the country on each side, products of the country, present commerce of the river, difficulties met with in navigating it, and the prospects for an increase in its importance as a navigable stream should it be improved, etc.

The Nooksack River is a narrow and tortuous stream, but drains a magnificent valley, varying in width from 1 to 5 or 6 miles to the mountains. It rises in the Cascade Mountains and empties into Bellingham Bay about 4 miles from the city of Whatcom, and 120 miles north of Seattle.

It is like the other streams, fringed with heavy timber and brush, and subject to sudden heavy freshets that wash the banks, letting in trees and roots that lodge at different points, and cause a shoaling or bar formation. During times of high water navigation is comparatively easy, but at low stages quite difficult and dangerous.

4 NOOKSACK, SKAGIT AND SNOHOMISH RIVERS, WASHINGTON.

The products of the country are hay, hops, some grain, fruits, etc. The area of cultivated land is yearly increasing, and the country is receiving its full share of immigration. Its soil is exceedingly productive, so much so as to cause favorable remark.

One of the principal difficulties to the navigation of this river is at its mouth where all the drift, or nearly all of it, seems to collect and remain; the shoal water on the tide flats, the prevailing winds during the winter months, and the location of the outlet all tend to prevent the mass of drift from going to sea, as it does from the mouths of other rivers.

It is frequently more difficult to get into or out of this river than to ascend or descend it. It isn't every tide that rises high enough to permit a steamer to enter. This could no doubt be remedied by closing up one of the two outlets and improving the other. The current of the river could be depended upon to aid the improvement.

Two regular steamers ply on the river when the stage of water is not so low as to endanger the safety of boats.

The amount of freight carried both ways is about 1,000 tons per month, and would be greater if the boats could be depended upon to make regular trips.

Very respectfully, your obedient servant,

E. H. JEFFERSON.

Capt. T. W. SYMONS,
Corps of Engineers, U. S. A.

2. SKAGIT RIVER.

SNOHOMISH, WASH., October 13, 1890.

SIR: I have the honor to acknowledge receipt of your letter of the 4th instant requesting a report on the Skagit River, Washington; a description of the river, the country on each side, products of the country, commerce of the river, difficulties met with in navigating it, and the prospects for an increase in its importance as a navigable stream should it be improved, etc.

The Skagit River is the largest and most important stream in the State. It is navigable, except at low stages of water, a distance of 110 miles. It rises in the Cascade Mountains and empties into Skagit Bay, about 60 miles north of Seattle.

It is like all mountain streams, crooked and swift, and fringed with a heavy growth of timber and brush; subject to periodical freshets, which invariably cause some change in the channel and leave a deposit of snags and other obstructions.

The country on each side, that is the bottom land, is of excellent soil and very productive. Large areas of it are now under cultivation and the acreage is being increased every year. It varies in width from 2 to 6 or 8 miles, including lands contiguous to its tributaries, the Baker and Sank rivers.

The products of the country are hops, hay, grain, fruit, and general farm produce. The manufacture of lumber is engaged in, and the logging industry is a vast and important one.

The towns and country in general are improving and filling up quite rapidly. Land values have increased fully 50 per cent. during the past six or eight months.

The principal difficulties to navigation are snags, drift piles, and shoals caused by them, also the tide flats at the mouth.

Improvement of this stream would greatly increase its importance as a navigable river.

Large and valuable deposits of iron and coal, fire-clay and other mineral are being developed and will no doubt in the future seek an outlet by the river as well as by rail.

There are several sloughs and channels through which the river finds its way to salt water. Steamboat Slough is the principal one, and used by the steamers. The others are inferior and occupied by the log-boom companies.

The present amount of freight carried by the regular river steamers is about 3,000 tons per month, general merchandise up and produce back. A great many passengers are also transported. Taking into consideration the tonnage carried by irregular steamers and that from the different sloughs penetrating the diked flat lands near the river's mouth, the amount would more than treble the above figures.

There are three regular steamers, freight and passenger (one carrying the United States mail), plying on the river from Seattle and several irregular ones.

The Seattle, Lake Shore and Eastern Railroad and the Great Northern Railroad are both bridging it and extending their lines to the north.

Very respectfully, your obedient servant,

E. H. JEFFERSON.

Capt. T. W. SYMONS,
Corps of Engineers, U. S. A.

3. SNOHOMISH RIVER.

SNOHOMISH, WASH., *October 13, 1890.*

SIR: I have the honor to acknowledge receipt of your letter of the 4th inst., requesting a report on the Snohomish River, Washington; a description of the river, the country on each side, products of the country, present commerce of the river, the difficulties met with in navigating it, and the prospects for an increase in its importance as a navigable stream should it be improved, etc.

The Snohomish River has its source through its tributaries, the Snoqualmie and Skikomish, in the Cascade range of mountains, and empties into Possession Sound, 30 miles north of Seattle.

There are three entrances to it; the main river, Eby Slough, and Steamboat Slough. The latter is used by the steamers; the former being partially blocked by log jams and shoals. The river is navigable at all seasons of the year as far up as Snohomish City (14 miles), and most of the year for 30 or 40 miles farther, including its tributaries. The lower part of it is comparatively straight and wide, but grows crooked and narrow as one ascends.

It is subject to periodical freshets, which overflow the banks in places and erode them, undermining and letting into the stream many large trees, stumps, and brush, some of which lodge and remain a nuisance to navigation until they are removed. They also cause bars to form.

The valley or bottom land on either side of the stream is rich and very productive, and varies in width from 1 to 5 or 6 miles—its entire length to the foot-hills. It is covered principally by a growth of maple, alder, cedar, and spruce timber and miscellaneous brush. It is gradually being cleared off and brought into a state of productiveness. Large areas have been cleared and settled for many years. The tide lands about the stream's mouth are being rapidly reclaimed by diking and putting under cultivation.

The Seattle, Lake Shore and Eastern Railroad crosses at Snohomish City, and the Great Northern Railroad will cross lower down.

The products of the country are hay, hops, oats, and general farm produce. Manufactured lumber also finds an outlet by the river, and the logging interests are very important. Large rafts are constantly being floated down and towed to the different mill ports of the sound.

The difficulties met with in navigation are snags, drift piles of timber, roots, and the consequent shoaling by reason of them. The tide flats at the entrance are also among the difficulties, except when the tide is full, but not so much so as at the other rivers.

Two regular steamers are at present plying on this stream from Seattle, and one smaller one is making occasional trips to its headwaters from Snohomish City. Other steamers come and go at intervals, and some of the large sound tugs come into the mouth on the tide for rafts of logs.

The amount of freight carried both ways is about 2,800 tons per month approximately. A great many passengers are also carried.

The different towns are increasing in population; evidences of new farms are seen on every hand; and the prospects of an increase of the navigable importance of the river by reason of improvement are very bright.

Very respectfully, your obedient servant,

E. H. JEFFERSON.

Capt. T. W. SYMONS,
Corps of Engineers, U. S. A.