

21400

WAR DEPARTMENT
United States Engineer Office
Seattle, Washington

APPENDIX B
Report on Survey for Flood Control of
Skagit River and Tributaries, Washington
dated

June 15, 1942

W. P. A. FLOOD CONTROL WORK

*File No. 1-17
Eng'g Dist - Skagit River
Ch. Wks. Br. - Eng'g Div*

Appendix B

(1)

WAR DEPARTMENT
United States Engineer Office
Seattle, Washington

APPENDIX TO
Report on Survey for Flood Control of
Skagit River and Tributaries, Washington
dated

July 30, 1940

W. P. A. FLOOD CONTROL WORK

W. P. A. Flood Control Work

July 5, 1940

REPORT

W.P.A. Flood Control Work
Skagit River Drainage Area, Washington

General.

Flood control work in this area consists of three major projects, all of which were under the supervision of the U. S. Army Engineers.

The designations and locations of these projects are as follows:

O.P. 65-93-895.....Skagit River, Skagit County.

O.P. 65-93-896.....Skagit River, Skagit County.

O.P. 65-93-902.....Sauk River, Snohomish County.

The principal features of the work involved are brush revetment and snagging, with a limited amount of shear cable at some of the less critical points along the banks.

The projects, as authorized, provided for an aggregate amount of \$328,260 from Emergency Relief Funds, and called for an expenditure of 340.8 man-years of labor with a maximum average labor quota of 331 men. The estimated duration of these projects varied from 8 to 14 months.

Individual Projects.

O.P. 65-93-895, Skagit River
Skagit County, Washington

General.

The project included that part of the Skagit River lying between the town of Burlington and a point about one mile above the town of Hamilton.

The project, as authorized, provided \$216,600 from Emergency Relief Funds subject to a 10 percent increase if required, and called for an expenditure of 231.5 man-years of labor based on a quota of 198 men for a period of 14 months.

The Board of County Commissioners of Skagit County, as sponsors, agreed to provide, in addition to the required rights-of-way and easements, certain listed equipment and a cash contribution in the amount of 5 percent of the cost of the project. Also, certain State money was made available for such materials and equipment as could not be otherwise secured.

Brush Revetment.

Work on this project consisted solely of the construction of brush revetment at numerous locations along the river where more or less serious erosion had been occurring to the bank structure.

Work was initiated on November 15, 1935, and the project completed on May 10, 1938, with an expenditure of 309.7 man-years of labor. The extended time beyond that estimated for the completion of the project was due to the fact that the average number of employees was only about 60 percent of the labor quota authorized by the approved project.

In all, six jobs were completed, involving the placement of approximately 190,751 square yards of revetment, which is distributed among the various jobs as follows:

<u>Job No.</u>	<u>Location</u>	<u>Length (Lin.Ft.)</u>	<u>Brush Revetment (Sq. Yds.)</u>
4	SE $\frac{1}{4}$ Sec. 17, T. 35 N., R. 6 E.	3,621	36,773
*8	E $\frac{1}{2}$ Sec. 23, T. 35 N., R. 5 E.	4,143	25,958
9	N $\frac{1}{2}$ Sec. 27, T. 35 N., R. 5 E.	2,418	19,452
10	E $\frac{1}{2}$ Sec. 29, T. 35 N., R. 5 E.	4,050	41,178
**11	E $\frac{1}{2}$ Sec. 34, T. 35 N., R. 4 E.	2,100	16,100
***12	NW $\frac{1}{4}$ Sec. 34) E $\frac{1}{2}$ Sec. 33) T. 35 N., R. 4 E.	<u>5,770</u>	<u>51,290</u>
TOTALS:		22,102	190,751

* See photographs 1 and 2.

** See photograph 3.

*** See photographs 4, 5, and 6.

Expenditures on this project were approximately as follows:

Brush Revetment--190,751 sq. yds. @ \$1.412.....\$269,349.

Distribution of funds:

Federal.....\$236,908

Sponsor..... 29,455

State..... 2,986

TOTAL: \$269,349

A considerable amount of damage to the various revetment units has been inflicted by log raft operations on the river in connection with logging activities being carried on in this area. Each unit has suffered damage to a greater or less degree, the greatest damage occurring on Job No. 8, on Arnold Slough, where approximately the entire lower 1150 feet of the revetment has been completely destroyed because of damage originating through collision of log rafts with the revetted bank. See photographs 1, 2, and 3.

In all, approximately 20 percent of this work has suffered damage, the greater part of which can be attributed to rafting operations. This condition has further been aggravated by the inability of the sponsors to provide necessary maintenance on this work. Had this maintenance work been possible, the damage to this work could have been very materially lessened.

O.P. 65-93-896, Skagit River
Skagit County, Washington

General.

This project included that part of the Skagit River lying between the towns of Hamilton and Marblomount, and all of the delta area lying south of the north main channel.

The principal feature of the work involved was snagging and clearing, with a limited amount of shear cable installation in connection with that work.

The project, as authorized, provided \$37,000 from Emergency Relief Funds, subject to a 10 percent increase if required, and called for an expenditure of 46.7 man-years of labor based on a quota of 70 men for a period of eight months.

The Board of County Commissioners, as sponsors, agreed to provide, in addition to the required rights-of-way and easements, certain listed equipment and a cash contribution in the amount of 5 percent of the cost of the project,

Work was initiated on December 15, 1937, and the project completed on February 25, 1939, with an expenditure of approximately 63.5 man-years of labor. The extended time beyond that estimated for completion of this work was due to the fact that the average number of men employed was only about 75 percent of the labor quota authorized by the approved project.

Snagging.

In the operation of this project, it was found that it would be impractical to attempt any snagging in the delta area south of the main north channel, as this would require special equipment which could not be provided by the sponsor. This work was replaced by the enlargement of the upper area downstream to a point on the river about one mile above Sodro Woolley. In all, approximately 36 miles of snagging were completed in this area.

Shear Cable.

Shear cables were installed at two locations near Lyman, one being just above and the other just below revetment job No. 4 on O.P. 65-93-895, for the purpose of effecting desired stream control in the vicinity of this revetment work.

Cost.

Total expenditures on this project were approximately as follows:

Snagging.....	36 miles	@ \$1,031.80.....	\$37,144
Shear Cable....	1900 lin.ft.	@ 2.15.....	<u>4,077</u>
		TOTAL:	\$41,221

Distribution of funds:

Federal.....	\$39,322
Sponsor.....	<u>1,899</u>
TOTAL:	\$41,221

O.P. 65-93-902, Sauk River
Snohomish County, Washington

General.

This project included that part of the Sauk River lying between the Snohomish-Skagit County line and Whitochuck River, approximately 13 miles upstream from the county line.

The principal features of the work involved were brush revetment and snagging, with a limited amount of shear cable at some of the less critical locations along the river.

The project, as authorized, provided \$53,000 from Emergency Relief Funds and called for an expenditure of 62.6 man-years of labor based on a quota of 63 men for a period of 12 months.

The Board of County Commissioners of Snohomish County, as sponsors, agreed to participate only to the extent of providing the necessary rights-of-way and easements for the clearance of this work. They did, however, make small voluntary contributions during the progress of the work.

Work was initiated on March 28, 1938, and the project completed on March 31, 1939, with an expenditure of approximately 49.4 man-years of labor. Although the average number of men was only about 80 percent of the number authorized by the approved project, the work was completed within the estimated 12 months.

Brush Revetment.

This work consisted of but one job involving the placement of approximately 3333 square yards of revetment along some 750 lineal feet of bank in the NE $\frac{1}{4}$ Sec. 5, T. 32 N., R. 10 E. See photographs 7 and 8.

Shear Cable.

This type of protective work was installed at seven locations in the lower four miles of the river for the purpose of checking moderate erosion of banks and blocking certain overflow channels which might, if unchecked, develop into major waterways. These jobs varied from 175 lineal feet to 765 lineal feet in length, amounting in all to approximately 3240 lineal feet of cable installed.

Snagging.

Snagging and clearing operations covered approximately 11 $\frac{1}{2}$ miles of the 13 miles included in the project. In the area above the highway bridge at Darrington, the drift and jam accumulations were comparatively light. In the area below the highway bridge, however, the accumulation was quite heavy with numerous large jams causing a considerable amount of stream diversion.

Cost.

Total expenditures on this project were approximately as follows:

*Brush Revetment.....	3,333 sq. yds. @ \$1.727.....	\$5,756
Shear Cable.....	3,240 lin.ft. @ 1.46	4,723
Snagging.....	11.5 miles @ 2743.74	31,553
	TOTAL:	\$42,032

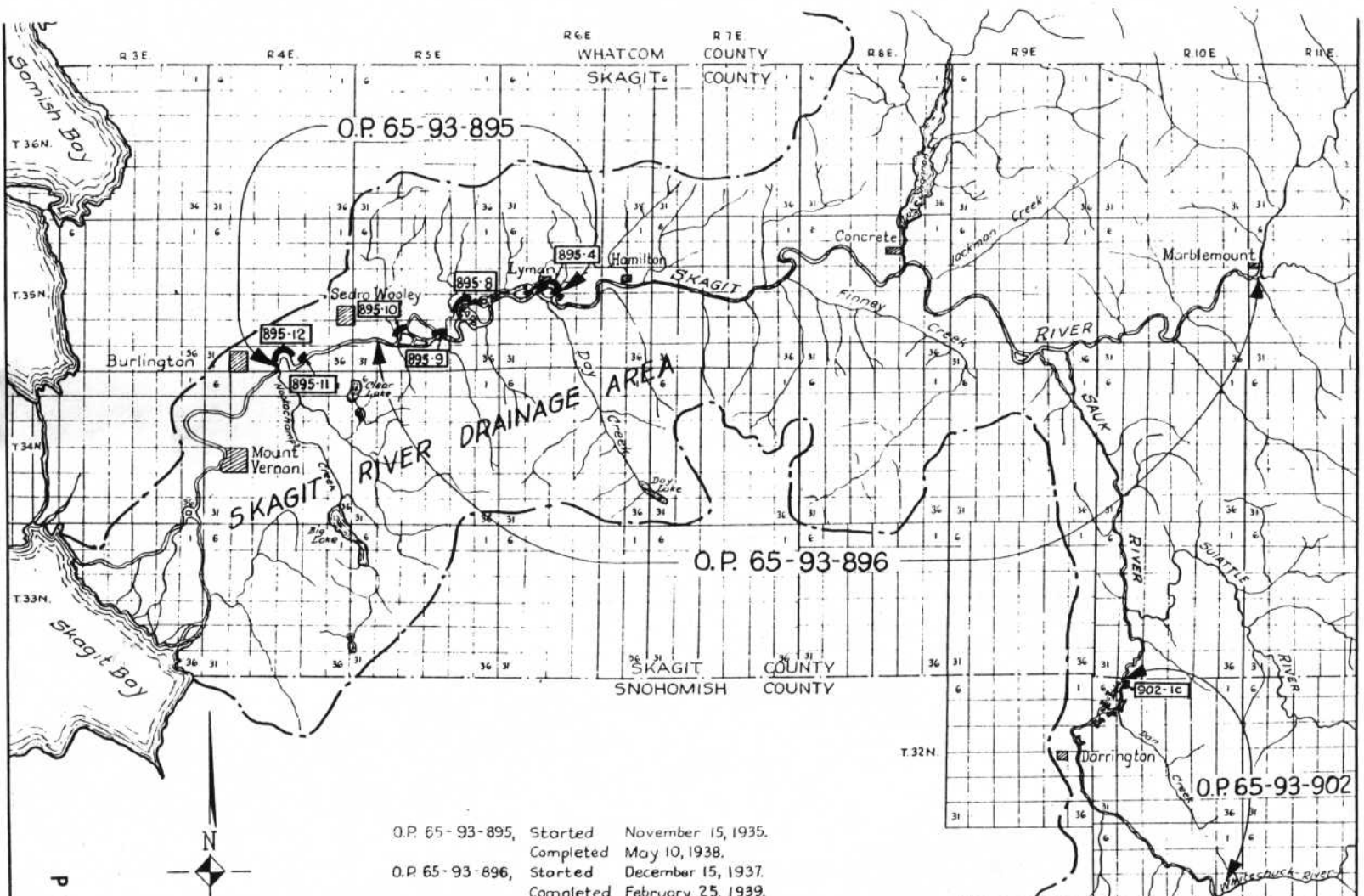
*See photographs 7 and 8.

Distribution of funds:

Federal.....	\$40,506
Sponsor.....	1,526
TOTAL:	\$42,032

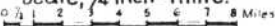
SUMMARY.

<u>Official Project No.</u>	<u>Federal Expenditures</u>	<u>Sponsor's Expenditures</u>	<u>State Expenditures</u>	<u>Totals</u>
65-93-895	\$236,908	\$29,455	\$2,986	\$269,349
65-93-896	39,322	1,899	-	41,221
65-93-902	40,506	1,526	-	42,032
TOTALS:	\$316,736	\$32,880	\$2,986	\$352,602



O.P. 65-93-895,	Started	November 15, 1935.
	Completed	May 10, 1938.
O.P. 65-93-896,	Started	December 15, 1937.
	Completed	February 25, 1939.
O.P. 65-93-902,	Started	March 28, 1938.
	Completed	March 31, 1939.

Brush Revetment 
 Shear Cable 
 Snagging 
 Limit of Drainage Area 

W.P.A.-USED. FLOOD CONTROL WORK
SKAGIT AND SAUK RIVERS
 SKAGIT AND SNOHOMISH COUNTIES,
 WASHINGTON.
 Scale, 1/4 inch = 1 mile.

 U.S. Engineer Office, Seattle, Washington. July 8 1940

P 002015

