

HISTORICAL RECORD OF DREDGING ON
THE SKAGIT RIVER

SKAGIT COUNTY, WASHINGTON

1920 THROUGH 1966

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PREFACE

This paper is the fifth in a series of papers that will be prepared regarding issues concerning the history of the Skagit River floods and other issues of local importance as well. Ninety eight percent of the verbiage contained herein comes directly from historical newspaper articles gleaned from a project that began in July 2004, when Skagit County Public Information Officer, Dan Berentson, contacted me and asked if I would like to help him review all the old articles of the Skagit Argus. I and my son Josef, jumped at the opportunity. We had barely began the project when we all realized that this was an opportunity to preserve the past for use in the present and future generations of our valley and we expanded the project to include not only the Argus, but the Burlington Journal, the Courier Times and the Skagit Valley Herald. The other 2% was obtained from Corps of Engineer documents.

It was originally planned to just concentrate on flood events themselves, however we quickly realized that this was an opportunity to preserve the written record of the history of our valley on many issues. Three hard copy books have been published and are available in local libraries and from the Skagit County Public Works Department containing the hard copy articles mentioned herein. The individual articles are also accessible by clicking on the PDF versions in this paper as well as the following two web sites: www.skagitriverhistory.com and http://www.skagitcounty.net/Common/Asp/Default.asp?d=PublicWorksSalmonRestoration&c=General&p=HistoricIndex.htm#_ftnref1. Neither Dan nor I benefit in any monetary gain for this project.

I would like to take this opportunity to publicly thank Stedem Wood, publisher of the Skagit Valley Herald for his cooperation on this project as well as Tony Flynn of the Argus and Ruth Richardson of the Courier Times. Local newspapers do not just bring us the day to day news. They are the recorders of history in the making and are without a doubt one of the most important elements in our society. Without them the past could so easily be forgotten.

I would also like to thank the members of my immediate family, my wife Linda of 25 years, and my two sons, Josef (my webmaster) and Jeffery (my PDF master). Having your family's support and understanding on any endeavor you set out on is priceless.

Larry Kunzler





Dredging – What Is It?

Dredging has many definitions however the most appropriate for the purposes of this paper is as follows:

In hydrologic terms, the scooping, or suction of underwater material from a harbor, or waterway. Dredging is one form of channel modification. It is often too expensive to be practical because the dredged material must be disposed of somewhere and the stream will usually fill back up with sediment in a few years. Dredging is usually undertaken only on large rivers to maintain a navigation channel. weather.gov/glossary/glossary.php

Likewise there are many different types of dredging methods all of which employ different types of dredgers. Hopper, Cutterhead, Dustpan, Dipper, Bucket and Sidecasting are all types of dredgers utilized in different circumstances. The method utilized on the Skagit River was sidecasting. (See Appendix or go to <http://www.usace.army.mil/publications/eng-manuals/em1110-2-5025/entire.pdf> for a more complete discussion.)

It is the purpose of this paper to take a historical look at what was talked about, proposed, and actually done on the Skagit River with respect to the dredging issue, utilizing historical newspaper articles and documents obtained from the Corps of Engineers, Seattle District.

Dredging – Early Discussion

The first mention that the Skagit needed to be dredged was found in the Corps of Engineers records:

During 1909 the *Skagit* pulled 1,774 snags from the Skagit River. Major Kutz wrote the following about the snag boat: “It is highly important to replace the snag boat by a new boat next season. The boat is now too old and worn, both in hull and equipment, to be repaired economically. What is needed is a new boat with a small suction-dredge attachment which can be used for cleaning-up work and removing bars and doing dredging on a small scale.” (Source: *Report of Major Kutz, Corps of Engineers Annual Report, 1908*)

The first newspaper articles located in the historic archives that dealt with dredging was in 1920 where apparently Congress had authorized the dredging of the Skagit River from its mouth to Mt. Vernon.

At the regular meeting of the Mount Vernon Commercial club Monday night it was announced to the members officially that \$30,000 was available for the improvement of the lower Skagit River. This appropriation was made by congress last year. According to a letter received by John Kill, chairman of the club’s river committee from Congressmen Lin H. Hadley, the federal engineers have approved the work. The letter also stated that before the work could be started, a bond must be filed protecting the government against claims for damages on



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account of the work to be done. The work to be taken up under the appropriation calls for the dredging of the Skagit channel from the mouth up the Skagit channel from the mouth up at least as far as Mount Vernon and the building of retaining walls where needed. Government engineers estimate that it will require at least \$45,000 to complete the task contemplated at this time and an effort is now being made to secure an additional appropriation of \$15,000 to finish the project. The work, however, is to be begun at once and carried as far as the money available will permit. (Source: [5/6/20 Argus](#))

Letters received in Mount Vernon this week from Congressman Lin H. Hadley carry the information that the war department engineers have approved the proposed improvement work on the lower Skagit River, and that the appropriation of \$30,000 made by congress last year for this work is immediately available. ... The war department also requires the filing of a bond protecting the government against claims for damages on account of the work done, which is now being prepared, and as soon as this is filed the work of improving the river will be started. ... The work to be taken up under the appropriation calls for the dredging of the channel from the mouth of the river to Mount Vernon, or further is required, and the building of retaining walls where needed. ... **There has been no money spent on the Skagit River for several years**, and it is reported that parts of the lower river are almost closed to navigation. The work to be undertaken at this time will re-open the river and make it navigable for small steamers the year round. (Source: [5/1/20 C.H.](#))

It is unclear from Corps of Engineer records as to whether or not this “dredging” was done as two years later the below article states that they were still waiting on the approval of the lower valley farmers to release the Corps from any liability for damages. What is known is that in 1920 the Corps dredged 14,461 cu. yds. of material out of either the Skagit, Puyallup or Snohomish rivers using the snagging boat “Swinhomish”¹. (Source: [5/31/91 MFR](#))

“When the farmers residing south of Mount Vernon all sign a waiver of damages, stating that they will not hold the United States government liable nor responsible for damages which might arise from high water or other unexpected causes, the government officials will agree to the expenditure of \$35,000 available for river improvement,” was the statement of Colonel Schultz, United States district engineer for the Pacific Coast, who was here on an inspection trip with assistant engineer H.J.E. Baker early this week. The snagboat, Swinomish, was used for this special inspection tour which included the Great Northern bridge, North Fork dam and Skagit River bar. The hope was expressed by the party that the matter of river improvement might be settled at once as it has been prolonged over a considerable period of time and is attracting much attention now particularly in view of the river and harbors appropriation bill introduced by Congressman Lin H. Hadley. (Source: [10/12/22 Argus](#))

Dredging – The Perception

¹ In 1929 this boat was modified and re-named the W.T. Preston. (Source: [5/31/91 MFR](#))



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Dredging has been perceived as one of the solutions to flooding for over 80 years. Following the disastrous 1921 flood event, then County Commissioner J. Z. Nelson commented:

No action has been taken yet by the various diking districts toward repairing the dikes, nor have any meetings been called to discuss future work. Many farmers are talking of calling mass meetings to talk over the question of proper protection from floods and many different theories as to what should be done are being talked about on the street corners. Many favor the building of a spillway from the Avon bend to salt water in Padilla bay, while others say that to straighten the river at the Avon bend by cutting a channel through from south of Burlington to a point at Mount Vernon. Others declare that the **Skagit river must be dredged from its mouth up to a point above Burlington**, and still others say that the Seattle dam at Ruby creek will offer much protection, although when this project will be completed is doubtful (*Source: [12/22/21 Argus](#)*)

Two weeks later a public hearing was held in which over 250 people attended and many more were turned away at the door. Dredging and straightening the channel were offered as solutions to flooding:

A mass meeting was held in the county court room in Mount Vernon Tuesday to discuss ways and means of eliminating the flood danger in the lower Skagit Valley. The meeting was attended by about 250 farmers and other residents of the valley, and plans for curbing the flood waters of the Skagit ranged from the building of a huge spillway from Mount Vernon to Puget Sound, changing the bed of the river, to the reforestation of the logged-off areas on the upper river. **A plan that met general favor was to consolidate all the diking districts to provide funds for buying a dredge to keep the channel of the river open the year round.** The only definite action taken was the appointment of a committee to make a thorough investigation of the matter. (*Source: [1/7/22 C.H.](#)*)

Charles Nelson, pioneer and strong dike worker, was the first to be called on by the chairman for his views on what course should be taken for flood prevention. He states it would be **useless to build more dikes** but that to build jetties at the mouth of the river, **dredge the outlets and straighten the channel** would be his solution of the problem. Peter Samuelson urged the consolidation of the diking districts, stating that to do so would save enough money to buy a dredge for the county and to keep it in use. . . . Alfred Polson spoke briefly **in favor of dredging the channel of the river**. He was followed by Captain Siegel who said he had no solution but offered the information that in some twenty odd years the river bed has risen eighteen feet. . . . O. Rudene spoke at some length urging that the **county should procure a dredger and clean out the channel**. Brian Dillon also **spoke in favor of dredging the river** and also **suggested that the height of the dikes be lowered**. He said it was better to get a little water more frequently than a whole lot at one time. (*Source: [1/5/22 Argus](#)*)

If Captain Siegel was right then the level of the bottom of Skagit River today would be about 92 feet above its current location. However, if the Captain was talking just about the mouth of the river then his testimony might be showing the secondary impacts of the levee system and the removal of the old log jams because the majority of



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the silt in the Skagit River 20 years before would have been distributed over the floodplain.

In recent years there has been some agitation for the purposes of controlling the floodwaters of the Skagit River, but as time passes on after a disastrous flood, the people of the valley easily forget that they ever had a flood, until another comes along. Then they will have meetings for some time **figuring on dredging** and straightening the channel, **but in the end nothings come out of it.** (Source: [3/20/24 Argus](#))

Flood Control Committee Investigates Work on Puyallup River

A large delegation of Skagit County citizens will go to Tacoma Friday and Saturday, December 1 and 2 to inspect the control work of the Puyallup River there. ...Mr. [W.J.] Roberts is chief engineer of the project. His letter follows: "Your question, 'How much of the work on this small stream would be applicable to our very much larger river?' My answer would be: All of it. That is, the three features which we most particularly emphasize, **river clearing, channel dredging** and bank protection, would apply with the same emphasis to the Skagit river as they apply to the White and Puyallup rivers." (Source: [11/23/22 Argus](#))

The snag boat Swinhomish did the work on the Puyallup so the earlier reference to 14,461 cu. yds. of material dredged was in all likelihood on the Puyallup, not the Skagit. (Source: [5/31/91 MFR](#))

On Saturday the party viewed the actual work on the Puyallup River under the direction of Mr. Roberts and Mr. Phillips, the engineers. It was shown that the cost of this project has already reached a million dollars.² (Source: [12/7/22 Argus](#))

Corps Lobbied To Study Dredging

The problems of the Skagit River were given a hearing Monday afternoon in the Seattle Chamber of Commerce before Col. Edward H. Schultz, representing the War Department of the United States. ... H.L. Willis presented the report which had been prepared to show the tonnage figures on the Skagit river and also gave other valuable information. He stated that the farm products originating in this county could be estimated annually at 50,000 tons of oats, 30,000 tons of hay, 12,000 tons of potatoes, 18,000 tons of straw, and 10,000 tons of general farm products. He declared that if the Skagit river was cleared of all obstructions an increased amount of tonnage could be handled each year. ... J.W. Collins, secretary of the Mt. Vernon Commercial Club, pointed out various phases in the written report given Colonel Schultz and spoke on the matter of dredging the lower end of the river. (Source: [1/25/23 Argus](#))

As to the character of the improvement desired, we may say in general that we want free and impeded access to the sea, in order that our rapidly increasing commerce may fully enjoy the advantages which our location very near salt water should give us. . . . We are a community of

² 23 men went on the trip. Most from Mt. Vernon, 5 from Burlington, 1 from LaConner and one from Allen.



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farmers and have not the skill or knowledge of hydraulic engineers. What we suggest therefore, in the absence of expert determination, is a result of our experience with the Skagit River for the past twenty-five years. The stoppage to navigation is caused by the formation of bars and the lodging of snags either at the mouth of the stream or along its source higher up. These same causes raise the bed of the stream and dam up the water during flood, increasing the high water menace. It seems to us therefore, that a free and open channel to the sea as well as the lessening of flood danger would both be accomplished by the prosecution of three general lines of work. First, beginning at deep salt water, two rock jetties should be built to the mouth of the river. . . . The second line of work must consist of removing the accumulations which now obstruct navigation. . . . The third line of work should be directed toward lessening the burden of silt and drift carried by the river. . . . To date all improvements have been with the idea of flood control alone. Thus there has been expended up to the year 1922, but not including that year, the sum of \$1,987,799.10 for dikes and drainage ditches. These dikes have not attained the object for which they were built as during each flood of any magnitude they fail to confine the stream and are broken in numerous places. Since the 1921 flood there has been some attempt made to take up this river problem along comprehensive lines covering both phases. There is at present a considerable sentiment among the residents and tax-payers of Skagit County in favor of forming an improvement district covering all the territory threatened by the river and adopting some plan for dredging and widening the channel. . . . A very conservative estimate of farm production over a period of years indicates that approximately 50,000 tons of oats, 30,000 tons of hay, 12,000 tons of potatoes, 18,000 tons of straw, and 10,000 tons of general farm products originate in this valley annually. . . . **Timber Shipments** The annual timber shipments approach the imposing figure at 300,000,000 feet. . . . **Navigation Now Difficult** It is a matter of common knowledge that the Skagit is one of the great commercial waterways of the Northwest. . . . But it is also a fact and a matter common knowledge that the entrance to this waterway is rapidly becoming blocked by bars and obstructions so that at the present rate of filling a very few more years will see the South Fork of the river entirely closed to navigation. Capt. F. A. Siegel of the U.S. Snagboat "Swinomish" has filed a statement with the Board of Commissioners of Skagit County in which he alleges that twenty-nine years ago when he started to navigate the river it was difficult to find bottom with a pike pole at any point in the South Fork between Mount Vernon and Puget Sound. The bottom of the river has now filled to such an extent that at low tide only small boats or skiffs can travel the channel. There has apparently been a filling in for almost the entire length of the South Fork of some 16 to 18 feet.³ **This condition can only be remedied by dredging.** (Source: [12/4/23 MVDH](#))

Corps Rejects Dredging Recommendation

Col. W.J. Barden, of the United States Engineer's office in Seattle, was chairman of the hearing. A report prepared by the Skagit County River committee, and signed by H.L. Willis, of the committee, . . . George B. Reah, County Commissioner, emphasized the need for protecting the farmer from high water stating that the last high water had cost the county \$100,000. C.C. Nelson also stated that this high water had cost Diking District No. 3, \$24,000. Other talks on

³ Levees did not start being built along the forks of the Skagit River until 1883. (See [J.O. Rundene Testimony, 11/26/24.](#)) Clearly the argument could be made that the sediment being deposited in the channel was a result of the levees being placed on the edge of the river as the sediment used to flow out onto the floodplain.



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the need of flood protection were made by J.O. Rudene and W.J. Knutzen. . . . In closing Col. Barden stated that the **proposed dredging at the mouth of the river would be expensive and that this work would have to be kept up from year to year.** He stated the **high water in the past had been caused by the contraction of the river at the bridges and that the present system of dikes had also caused more contraction of the stream.**⁴ The colonel also stated that the federal government at present was making **no provision for flood control** except on the Mississippi and the Sacramento rivers, and that the engineer's office was confined entirely to navigation problems and that the hearing here would be considered only from that standpoint. . . . The opinion seemed to prevail that if protection against high water in the Skagit River was to be secured it must come from the county and state and not from the federal government. (Source: [12/6/23 Argus](#))

Skagit County Should Buy A Dredger

It is quite possible that Skagit County can obtain without cost,⁵ a government suction dredge for use in the Skagit River channel if the county will make concerted appeal to the proper authorities in Washington; it is the opinion of Charles Gaches, local farmer. . . . The rapid depositing of sediment in recent years has resulted in bringing the river bottom up to a level almost as high as the farming land, especially along the South Fork, and increased the necessity of building higher and higher dikes all along the lower end of the valley. At the same time the river has been cutting away the banks, making it more easy for high water to undermine and come through on the inside of the dike as happened during the recent freshet, it is explained by the local man. (Source: [3/17/32 Argus](#))

Once more the **feasibility of a government dredge**, available for extensive channel work in Washington's troublesome rivers, has been demonstrated by a freshet, which stopped just short of inflicting real damage in the Skagit Valley. Dikes have risen even higher, yet each freshet has found them practically at the same relative height. The explanation offered by men long experienced and by engineers has been that the bottom has constantly kept pace with the elevation of the dikes. If this is true (and we have no reason to doubt our authority) a partial remedy, at least, is likely to be had by the deepening of the channel. To bring this about it would seem wise to ask congress to reinforce the government's present Sound equipment with one of more dredges so that rivers, such as the Skagit, may have a larger measure of flood relief. **Another thing we have learned is that the power dams are not the protection engineers promised.** (Source: [5/3/32 Argus](#))

The greater part of the September meeting of the Skagit County Chamber of Commerce, held in Burlington Tuesday evening, was devoted to a discussion of flood problems on the lower Skagit River. It was said that the bed of the river was steadily rising, causing a flood menace every time the water reaches a high stage. The reason for this is that the volume of water needed to bring the stream to the top of the dikes is now much less than when the channel was kept open. The question was first brought up by Fred Ornes of Mount Vernon, who urged the chamber to start a move to secure the placing of a government dredge in the Skagit river, to be

⁴ These statements by Colonel Barden clearly justify the preceding footnote.

⁵ Cost of dredge was \$150 per day but hadn't been used in 2 years.



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used in keeping the channel open at all times. Supporting talks were made by G. O. Moen of Mount Vernon, Jas. Squires of Edison and by Pres. C. D. England. A motion was unanimously passed empowering the president to appoint a committee of three to draft a resolution asking the government to place and maintain a dredge in the Skagit, the resolution to be submitted to the various chambers of commerce in the Puget Sound district. The president named Fred Ornes, G. O. Moen and Howard Sackett to serve on this committee. (Source: [9/22/32 C.H.](#))

An appropriation of some \$100,000 was made this week from the state's recent relief bond issue, to purchase a dredger for the Skagit River. W.R. Morgan, county welfare commissioner, headed a delegation to Olympia the first of the week, and obtained this appropriation as the first step in a program of flood control on the Skagit. The new dredge will be equipped to build dikes and to work both along the bay front and the river. It is estimated it will take ten men to run it, and it is believed that CWA labor can be used. A plan of reorganizing dike and drainage districts to facilitate the work of rebuilding dikes, will be discussed soon. (Source: [1/18/33 CT](#))

There is absolutely no indication in the record that Skagit County ever purchased a dredger. Corps of Engineer records do not actually indicate Skagit River dredging until 1941 although it is believed in talking with local residents that some dredging (side-casting) was done between 1920 and 1941. (Source: [5/31/91 MFR](#))

Consolidation of Dike Districts

As the following articles indicate it was believed that if the local Dike Districts would consolidate they could unite and perhaps proceed with dredging the Skagit. It appears that is Mt. Vernon's Dike District #3 that killed the proposal.

May 6 may determine the fate of flood control in the Skagit Valley. On that day the diking districts will hold their annual election; and, if present plans are carried out, consolidation will also be submitted to the voters. Petitions asking for consolidation election are already being circulated. Avon has taken the lead and will hold a mass meeting tomorrow night to consider the proposal. . . . "Under the law, the county can get state, federal and county aid for flood control, but consolidation of diking districts will be necessary," Mr. Welts asserted. . . . The program involves building up the bay front dikes, the Skagit River dikes and the straightening of the Skagit River. Fifty thousand acres of land and 10,000 people are involved. . . . "If you don't unite now, just forget ever trying to get help in the future, because you can't get it as individuals," Will Hayton warned. (Source: [1/25/34 Argus](#))

A mass meeting of property owners in Diking District No. 12 will be held this Friday evening in the Avon gymnasium, M.F. Snelson, chairman of the board of diking commissioners announced this week. Action will be taken on the proposal to merge all 16 diking in the county to obtain federal aid in one big flood control project. Meetings will be called in all diking districts to obtain the sentiment of the people in each toward the general project. If the consensus of opinion is favorable, an election will be held to vote the project through. The first



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step in the program was an **appropriation of \$100,000 for a dredge** by the state last week. (Source: [1/26/34 B.J.](#))

First concerted opposition to merge all the dike districts of the county in an effort to draft a flood protection program that might result in federal, state and county appropriations was heard at a meeting of farmers of dike district No. 3. at the Finn hall at Lower Cedardale yesterday afternoon. A motion was adopted to delay signing a petition, which provided that a special election be called. Considerable sentiment was expressed against the consolidation plan, several speakers saying they could not see that the district would derive any benefits. It was then decided to “table” the proposal for consolidation, at least until definite information is forthcoming. (Source: [2/2/34 MVDH](#))

Dredge Necessary For Flood Control

. . . But let us not forget that no matter how high our dikes are built, if these two rivers get “out of control” (Skagit and Samish) like all of us have seen them do in the past, we will have the same old trouble, only worse. In my opinion there are two things to be done, the necessity of which is so self-evident that no proof is required. Those two things are: dredge and straighten these two rivers properly, and construct adequate spillways. (Source: [5/17/34 Argus](#))

Dredging Not For Flood Control

What little “dredging” (side-casting) took place on the Skagit River was not for flood control as the Federal government only maintained rivers for navigational purposes only, a policy which had not changed since 1923. (Source: [12/6/23 Argus](#))

Col. Howard A. Hanson of Seattle, head of the state flood control council, gave an interesting talk to the Skagit County Chamber of Commerce at their monthly hour here Tuesday evening, in the crypt of the Episcopal church. Some fifty business men from all parts of the county attended the meeting. Col. Hanson for years has been attorney for King county and Pierce county in their flood control work on the White, Green, Puyallup and other rivers, and is a recognized authority on both the engineering and legal ends of flood and erosion control work. He was introduced to the audience by A. G. Mosier of this city, Skagit county member of the state flood control council. The speaker told of the need for a state and national program of flood control, and explained the **policy of the federal government which refuses to spend any money on rivers beyond their limits of navigation**, regardless of damage done by the river. (Source: [6/14/34 CT](#))

Hansen Creek Dredged

Work will be started at once on unfinished CWA relief projects in this county, according to information received by the county project manages. The dredging of Hansen creek will be



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the first to be resumed here, and will probably start next week. . . . The WERA will appropriate \$1,000 for rental of a gas shovel to use on Hansen creek, and \$864 for employment of non-relief shovel operators. There are no shovel men available from the relief rolls. Twenty men from this list will be put to work on the grading work in addition to the shovel men. The total cost to complete the work is estimated at \$6,200. (Source: [7/12/34 CT](#))

Flood Control Needs A Plan

Flood control talk again takes the spotlight, after the highest water seen in Skagit county in years. A year from now, with more melting snow in the hills, we'll probably still be talking, with nothing more accomplished. A three-point practical control plan that would cost certainly no more than is now being spent, is here presented by The Journal as something to start from:

1. Secure co-operation in some way with the power dams up river to help regulate the volume of water in the river. At periods of low water in winter or spring, water in these reservoirs could be lowered; during periods of heavy thawing there would be room to hold much water while the river was naturally full. 2. With the money being spent this year and next by diking districts, **buy or build a Skagit River Dredge** that would remain constantly in the Skagit, digging a channel deep enough to carry the water out, straightening out the stream by taking out the bends, and putting the rich silt where it will do the most good. 3. With the foregoing dredge, build strong emergency dikes equal distant from the river banks all the way down. This would eliminate the wide places and "bottlenecks" in the present dike system, which so often causes breaks and weak spots in the dikes. (Source: [2/1/35 B.J.](#))

A super organization of all county diking districts, so that the county can appeal to the federal government for aid in curbing the flood waters of the Skagit and Samish rivers, was proposed at a meeting of the Burlington chamber of commerce here last night, and the group adopted a resolution asking the state legislature to pass the necessary laws to make this possible. The proposal, as outlined at last night's meeting, does not mean that the dike districts would consolidate, which was described as virtually impossible. The idea is to organize a dike union, similar to union high schools. This would give all the dike districts an organization which could go to the federal government for aid. At present, no single district is large or strong enough to carry any weight in appealing to the government, it was pointed out. . . . Another flood control measure was advanced at the meeting by W. D. Knipe, well known local man. He proposed an investigation to determine the feasibility of the county bounding itself to the extent of \$100,000, or the amount necessary to **purchase a dredger for use on the river**⁶. He said various districts which use the dredger could be assessed a certain amount for operation expenses and depreciation. The dredger would not only deepen the channel, but at the same time it would aid in strengthening the dikes. In this connection, Knipe said it would permit the building of sloping dikes to that the pressure of the river during high water would not undermine. (Source: [2/6/35 MVDH](#))

The Journal's discussion of flood control in the Skagit valley, started last week, brought many comments and the first of a series of letters from readers. The letter, written by a

⁶ Proposal to purchase a "dredger", like the proposal to form a dike union never happened.



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Burlington man who for the present desires to remain anonymous, is printed below. In our cussing and discussions on this problem of river control...there is one law that may not be violated with impunity; i.e. water in seeking its own level follows the line of least resistance. Formerly this river shaped its course along the line of the least resistance, occupied that course until by deposition the accumulated particles of mountain that course became untenable, then moved over to a new bed. Hence the fairly level area extending from Blanchard south for miles.

Then comes puny man. Now we have no fault to find with the pioneer who diked his land with a dike a foot high, extending from spruce root to spruce root. As a matter of expediency this was an acceptable plan. However, since the bottom of the river at Conway has now become elevated by deposited silt until it is above the extreme high water mark of forty years ago, having added elevation at an average rate of six inches per year. It seems reasonable to suppose that the present bed will soon become untenable, for the water is now finding its line of least resistance through and not between the dikes, and we have long since reached the limits of that method of flood control as an expedient.

With the increased erosion to be expected with the removal of timber from the upper areas that dike in another forty years will be approximately fifty feet high.⁷ Then when she breaks, as she surely will, LOOK OUT BELOW! For every annual six-inch addition to the lower dikes at least an equal amount must be added to the dikes farther up. Why not put in some good substantial control gates in the river dikes which will permit of an ordered and orderly flow into Varney slough and such other depressions as may serve as setting basins, thus securing for our use this valuable silt deposit, thus raising the level of the land and adding fertility, permitting the excess water to pass out through the saltwater dikes through well constructed automatic flood gates of ample capacity! Since the deposit of silt at the mouth of the river is generally, and correctly, held responsible for the trouble, why not bend every effort toward removing said deposit at the earliest possible date and least possible cost? . . . **A good hydraulic dredge can remove that silt for cents per yard as compared with dollars per yard for more dirt on the dikes** by present methods. Much of the deposit removed may be well used in strengthening and straightening the banks and such dikes as are necessary to maintain-stay outside and along the saltwater dikes. (Source: 2/8/35 B.J.)

People who really know the Skagit river seem to agree that the whole valley would be much **better off if there were no river dikes at all**, provided the bed of the stream could be kept deep enough and straight enough. A dredge is needed to do that job. Not impeded by dikes, ordinary winter high water would help, not hurt, the Skagit valley. Dredging the river and perhaps small dikes would protect the crops from spring freshets that would do harm. Leave the river alone and it rises at least half a foot a year at the mouth. Under our present system, dikes must be raised, too, every year. The dikes have never yet held the river at flood stage and when they do break, look out below. The whole argument points to **spending dike money on a dredge and getting at the bottom of the thing**. What do you think? (Source: Editorial 2/8/35 B.J.)

Another Public Hearing

⁷ 50 feet high? Might want to re-calculate just a bit.



Historical Record of Dredging On The Skagit River

A public hearing on the formation of a flood control district in Skagit County will be held in Mount Vernon either July 1 or 2. Grant Sisson, a member of the state's flood control commission for Skagit, disclosed today. . . . The proposed district will embrace all of the county east of Swinomish channel. . . . Formation of the county's first step in compliance with rules laid down to obtain federal aid for flood control. . . **What Should Be Done** 1. **Dredging of lower channels of river. A dredge operating in lower channels would deepen same, thereby releasing pressure upon dikes and supply the necessary material for broadening and strengthening dikes.** Sloughs at the western ends of the North and South forks of the Skagit river should be cleaned out to allow free passage of water. This work should be carried out to deep water. 2. Bank Projection. Bank protection should be started as soon as possible to save existing banks and the erosion of acres of valuable bottom land now in danger of being carried away at the next stage of high water. . . . 3. Cooperation of Shannon and Diablo dams at peak of floods: This is shown by the graph compiled by the U.S.G.S. of the high water of 1932 in the flood of February 27, when the peak of 182,000 cubic second feet, a control of 61,500 cubic second feet. . . . Nookachamps creek, running from Big Lake to the Skagit river, offers another possible storage reservoir. . . ." (Source: [6/8/35 MVDH](#))

Corps Deletes Dredging Funding

An offensive on the Skagit and Samish rivers, with scores of men taking up various implements as cudgels in the fight against future floods in the county, is soon to be underway. . . . Federal funds amounting to \$358,000, obtained through the works progress administration, will be expended in building up and strengthening the existing banks of the two streams in the hope that this method will contribute immeasurably in controlling the waters of the Skagit and Samish rivers, which in the past have caused thousands of dollars of damage in their wild rampages through rich farm lands of Skagit county. . . . The **Skagit county planning council had previously asked \$2,000,000 for dredging in North Fork and South Fork and main channel of the Skagit River**, and had requested \$1,000,000 for sloping and riprapping banks to prevent soil erosion. The council had also petitioned for \$275,000 for dredging and building adequate dikes on the Samish River. Flood control has been designated as the main objective of the planning council. (Source: [10/31/35 MVDH](#))

Main Reason Why Dredging Mouth of Skagit Won't Stop Floods

Two U.S. army engineers from the office of Col H. J. Wild, in charge of the district, today told the Mount Vernon chamber of commerce that \$4,982,000 flood control channel from Avon to Padilla bay is the most feasible procedure to eliminate flood danger in the lower part of Skagit county. . . . "The Skagit river has been studied from many different angles." Maj. Baker stated, and after naming several stated that the most effective means visualized was by the diversion of the channel at Avon." . . . Many questions and suggestions were raised by the people present. Suggestions by Wm. Hayton, Albert Mosier and Gene Dunlap that rip-rapping the cut banks of the river from Mount Vernon to the Sauk and dredging the mouth of the river were heard. The guest speaker stated that such was a good policy but that its cost would far exceed



Historical Record of Dredging On The Skagit River

that of the channel proposal. He estimated the costs of such a system at eleven million. **Dredging at the mouth of the river met opposition from the speaker. Dredging will have no effect on high tides, he stated. And high tides are always higher during flood periods. It is the high tide that will tend to hold your river up, he added.** (Source: [11/5/36 MVDH](#))

Corps Says Dredging "Inadvisable"

A letter written by U.S. Senator Homer T. Bone last April 26, and received here by Mrs. W. F. McCormick, secretary of Skagit Pomona Grange, revealed that the chief of engineers, U.S. **war department, considers the dredging of the lower Skagit as "inadvisable" at the present time.** The letter from Bone, and several others, was read at last night's Pomona meeting. . . . Major Gen. E. M. Markham, chief of army engineers, wrote to Bone as follows on the subject: "I have recently had a report from the division engineer, north Pacific division, advising me that three of the subsidiary sloughs were closed by the construction of dams or dikes at their heads in 1910 and 1911. These dikes have been reinforced and reconstructed from time to time. Their purpose was to confine the discharge to one channel and thus increase the navigable capacity of the south fork of the river. "If the sloughs were opened, the water would be divided between the sloughs and the main channel, and the existing navigation channel would be destroyed. This channel is used by tugboats towing logs from Tom Moore slough and from points up the river to Utsaladdy where they are taken in tow by deep water tugboats. (Source: [5/6/37 MVDH](#))

One Week Later

Indications that Skagit County's proposed river dredge for Puget Sound rivers will receive favorable consideration from the federal government were apparent this week . . . Senate bills authorizing the war department to make a survey of the Skagit have been introduced by Senator Schwellenbach, it was reported. . . . "General Pillsbury, who is familiar with the Skagit problem, expressed the opinion that this **project as outlined was feasible.** The result of this conference with the War Department was the introduction of a bill for an immediate survey of the North and South fork of the Skagit river for the purpose of determining the cost in order to present a bill to dredge. (Source: [5/13/37 Argus](#))

Dredging Plans On The Fast Track

Congressman Mon Wallgren today notified Postmaster C. F. Shrauger of this city by telegram that U.S. army engineers in Washington, D.C., had approved plans for a complete survey of the north and south forks of the Skagit River from the bay as far as Mount Vernon. "This means that we are one step nearer in our campaign to have the lower Skagit dredged for the benefit of flood control, drainage and navigation," declared Shrauger. . . . Officials of the Skagit dredging association expressed much concern over a report sent to Washington, D.C., that the association was advocating a government owned dredge. While this might be desired the



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association did not think it advisable to ask for other than the dredging of the river, Mason declared. He commented that today's action by the army engineers shows that the congressman and the two United States senators have fully presented the Skagit problem to the war department. (Source: [6/5/37 MVDH](#))

Plans for a complete survey of the north and south forks of the Skagit river from the bay to Mt. Vernon received the official approval of U.S. Army engineers in Washington, D.C., . . . "This means that we are one step nearer in our campaign to have the lower Skagit dredged for the benefit of flood control, drainage and navigation," Shrauger told a press representative. . . . Congressman Wallgren has filed a bill calling for the dredging of the north and south forks of the Skagit. The future of the bill depends on the findings of the U.S. engineers in their survey, it has been pointed out. (Source: [6/10/37 Argus](#))

Dredging Plans Slow Down

. . . Wallgren told the meeting that he was much pleased with the flood control and river bank erosion work being carried on along the upper Skagit River under the \$216,000 WPA project, and favored enlarging the project to complete needed bank protection, before any money is spent in dredging the mouth of the river. He said he could see no sense in spending a huge sum dredging the lower part of the river so long as land and silt is washed down in huge quantities to fill the lower river as rapidly as it is dredged. When the river banks are all protected, is the time to talk about a big appropriation for dredging the mouth of river, he said. The river bank protection, clearing the river of snags, diking and dredging should all be part of the task of making the Skagit River safe from flood and land destruction. (Source: [10/28/37 CT](#))

Another Study – Dredging For Navigation Only

Under the direction of John Mason, chairman of the county commissioners, plans are progressing for a comprehensive program for the Skagit river to include completion of river bank protection work, **dredging and snagging**, and other work needed to make the Skagit less dangerous both as a source of damaging floods and as a constant menace to farmland by erosion. United States army engineers are preparing a detailed project to include the entire river, and it will not be long before a river project larger than the former one will be set up, with government funds, backed by the county, to complete the bank protection work at Utopia, Day Creek, Conway and other dangerous points left unfinished when the funds were exhausted this month, and work was transferred to the Samish river. The county officials deserve the thanks of the entire county for agreeing to carry on this most important work, which will be of untold value to the entire county, and is the first constructive work done in this district to try to save the huge loss to rich Skagit farmlands, **and to make the lower part of the Skagit deeper for navigation.** (Source: [4/12/38 CT](#))



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W.T. Preston – Snag Boat

In 1929 the Seattle District of the Army Corp of Engineers put the Preston to work, collecting debris from Puget Sound, Lake Washington, and tributary rivers. It was named for W.T. Preston, the only civilian to ever hold the title of Seattle District Engineer. The Preston measure 163.5 feet long by 34.5 feet wide, it had a crew of 15 and had yearly removal rate of 1,100 cubic yards of debris. It had a gross tonnage of 291 tons, and it's steel hull (replacing its original wooden hull in 1939) displaced 494 tons. It was built by the Lake Union Dry Dock in Seattle, Washington, using many parts, including the main engines, from it's predecessor the Swinomish. After it's retirement in 1981, the Preston, became a National Historic Landmark, and currently sits on land, but near the water, in Anacortes, Washington. It is open to the public between Memorial Day and Labor Day weekends. (Source: <http://www.dieselduck.ca/images/Preston/>)

Between 1942 and 1960 the *W. T. Preston* dredged (sidecast) 796,324 cu yds of material and pulled 11,798 snags. Most of the *W. T. Preston's* work was done in the North Fork of the Skagit River up to Mt. Vernon with occasional trips above Mt. Vernon. Only one trip was documented as far upriver as Hamilton. In addition the U.S. Dredge *Swinomish* sidecast an additional 243,739 cu yds of river bottom material during the years 1949 through 1951, all upstream of Mt. Vernon. (Source: *Corps of Engineers Annual Reports, 1942–1960*,



See Appendix A **Skagit River History**) Picture courtesy of <http://www.anacorteshistorymuseum.org/preston.htm>
All of the work performed was strictly for navigational purposes and had no impact on flood control.

Nookachamps Creek Dredging

County officials this week received assurances that the State Department of Conservation and Development would grant substantial financial aid in carrying out three major projects, the by-passing of the “Burlington Bend” in the Skagit River, the restoration of Nookachamps Creek to its old bed and the development of the Cascade mine-to-market road. . . . A state fund of \$100,000 is expected to be made available (for Bend project). The commissioners are planning to get the river project underway soon and hope to see it completed before the late fall high water period. They propose to send the river through a new channel, on a straight line from the upper end of the Burlington ox-bow to the lower end, where Nookachamps creek enters. The state, the county and the drainage district involved are to pay a third each or about \$6,000 apiece, to dredge out the old channel from which the Nookachamps creek moved last winter, and to clean out numerous log jams along the channel. The creek has spread “across country” for a mile, Hughes said. (Source: [7/24/47 Argus](#))

Burlington Bend (Strawberry Bar) Project Changed

In 1946-47 the Skagit River was eroding the riverbank in the Burlington Bend (right bank) – Strawberry Bar (left bank) area. So much so that a bold plan to cut a



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channel across Strawberry Bar was proposed. However as the articles below describe, the plan ran into trouble when the Corps of Engineers demanded that the “channel” be dredged 400 feet wide or money for “potential damages” be placed into escrow.

Chairman Lowell Hughes of the Skagit County Commissioners announced this week that a \$100,000 project to send the Skagit river over a new course east of Burlington and eliminate the dangerous oxbow bend that has been eroding farmlands there might be undertaken this summer. . . . The proposal most likely to be adopted, Hughes indicated, is to open a new watercourse from the upper end of the Burlington bend to the lower end, where Nookachamps creek enters the main stream. This would be accomplished by digging a shallow course with heavy equipment and letting action of the river deepen and widen the new channel. Heavy erosion was observed during the May freshets in the Burlington Bend area. The eating away of the farmlands in the bend is still going on and may grow worse . . . Last year several farm buildings were lost to the river. Hughes said owners of property that would be affected by the new channel project are being contacted. . . . Only alternative to digging a new channel is a heavy revetment program around the bend, which would be much more costly. (Source: [6/12/47 Argus](#))

The members of the board of Skagit County commissioners are well aware of the consequences of tinkering with the Skagit river’s course when they propose to “do something” about the stream’s steady encroachment on valuable farm lands east of Burlington and its threat to that city itself. That was made plain as day Tuesday night when Chairman Lowell Hughes told a chamber of commerce industrial development audience here of the commissioners’ plans. Hughes’ frankness was refreshing, as he emphasized that “we are sticking our necks way out on this project.” So little had been said recently of the proposal to start the river on a new course designed to eliminate the river’s “oxbow” bend at Burlington and stop its present heavy erosion (erosion that has been moving ahead ominously during recent weeks’ high water) that Hughes’ comments took many by surprise. The spirit of courage, in undertaking a project of such magnitude with its many uncertainties, is commendable on the part of the commissioners. Eliminating the “Burlington Bend” of the Skagit probably will be only the beginning. The Skagit is a constantly shifting type of stream. **One remedy may merely breed a new erosion problem at another point.** Of this the county commissioners are well aware. But they are willing, backed by the best engineering advice they can obtain, to take the chances involved and to go ahead and try to do something about the river problem; that is much better than sitting back doing nothing for fear “something might happen”. Were the commissioners to take the latter course, there is danger that the whole lower Skagit valley might undergo drastic change. The flood control engineers agree that the river threatens to cut into Gages slough, on the south-eastern edge of Burlington and make a new channel through Whitney, or within eight or nine years to take out the Burlington-Sedro Woolley highway, the Great Northern right of way and work a new course running into the Samish river. Far-fetched? The engineers don’t believe so. (Source: [6/12/47 Argus](#))

Rock Revetment to Be Used in Bend Above Burlington . . . revision of engineering plans at Burlington Bend, switching back to the original bank revetment program. . . . “Plans were submitted last week to the Army Engineers for final approval,” said Hughes, “but requirements placed upon the job by Colonel Hewitt’s office makes it impossible for Skagit County to carry out the plan as originally proposed.” “The stipulation which has brought about



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the change in Burlington Bend erosion control plan is the requirement by the federal government that Skagit County either dredge the entire channel which the river will require, that is a stream bed approximately 400 feet wide, or that funds be put in escrow by the County for the future dredging down stream of the material removed by the river establishing its normal channel width.” Mr. Hughes pointed out that Skagit County is expending every effort to correct the present Burlington Bend, that funds are not sufficient to put money in escrow for such an unknown contingency, therefore, the Commissioners had only one choice to make, that of spending what money was available in rock reveting the worst sections, of the curve. (*Source: [8/7/47 Argus](#)*)

Swinhomish Slough Dredging Damages Dikes

Congressman Henry M. Jackson will confer next week with Col. L. B. Hewitt, district head of the U. S. Army Engineers, in an effort to work out a flood control problem along the Swinomish slough near the Dorsey farm west of here, it was announced today. . . . Extensive dredging of the slough has resulted in wearing away of the dikes, making break-throughs possible. One such break-through occurred in that area last year, flooding several acres of farm land under two to three feet of salt water. (*Source: [10/14/48 MVDH](#)*)

Another Public Hearing on Flood Projects

Navigation Main Topic -- The hearing it is understood, is called primarily to poll local opinion as to the projects the engineers propose, principally dealing with improving navigation on the lower Skagit River. **Project Described** -- “The existing project provides for channel stabilization through the delta by means of a dike at the mouth of the South fork; regulating dikes and a mattress sill near the head of North fork; and closing subsidiary channels at the delta; and for **increasing the available depth at Skagit City bar by dredging and by training walls.** The length of the section included in the project is 9 ½ miles. The mattress sill, closing dikes, and 10,450 feet of training dike at the mouth of the South fork are completed. The training dike was completed to a length 5,550 feet less than project length. The work at Skagit City bar awaits the local cooperation⁸ required by the act of 2 March 1919. (*Source: [3/17/49 Argus](#)*)

New Channel Proposed For Mouth of Skagit

Efforts to get the government to clear the channel of the lower north fork of the Skagit river are going to be continued even though hope for quick action was discouraged by officials who conferred in Mt. Vernon Tuesday with the new Skagit River Control association. . . . Hughes declared a dredge could cut a proposed shortcut channel for the mouth of the North Fork at not too great expense. The new channel, across the point toward Craft island would shorten the river by about two miles “getting flood waters out into the Sound just that much quicker,”

⁸ Documents obtained from Corps files show that the dredging at Skagit City Bar did not happen as they never received local cooperation from the farmers.



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Hughes explained. . . . Here for Tuesday's discussions, Col. Itschner said he believed the North Fork cutoff was of such a size that it would have to be put through as a new, rather than an emergency project and that would take time. It would also require jetties at the mouth and regular maintenance work, he said. Col. Itschner and Rep. Jackson said \$60,000 was being requested for emergency dike raising at Milltown and dike and road raising in the Dodge Valley vicinity. (Source: [12/22/49 Argus](#))

Dredging for Flood Control Not Feasible

The US army engineers are nearing completion of a comprehensive study of Skagit River flood conditions, but a representative of the Seattle district office today held out little hope for any action by the army engineers in the foreseeable future to remedy the situation. Byron Clarke, speaking before the members and guests of the Mount Vernon Kiwanis Club this noon at the President Hotel, said that the flood control plan considered most feasible by the engineers – raising of the dikes along the entire lower river – could probably not be justified economically to earn Congressional approval for the project. He said the long-proposed Avon Bypass plan, cutting a channel for emergency overflow from the Skagit River to Padilla Bay would be “slightly more expensive” and indicated it would not have compensating features making it a first choice plan. . . . “Not a penny has been appropriated for the Avon By-Pass to date,” Clarke said in answer to a question. Clarke pointed out that under the existing law flood control projects must be “economically justified” by showing that damage which would be prevented over a period of years would exceed the cost of the work, spread out of the same period – say 50 years. He said that even the least expensive way of meeting the flood situation on the Skagit could not be justified on that basis. . . . This year's flood, he pointed out, was exceeded in volume and damage by several in the past and he was inclined to doubt that “floods are getting worse.” **He also disputed a remark that “the Skagit is silting up,” quoting studies made of the river bed near its mouth in 1930 and 1950, showing comparatively little change.** He discounted the importance of **closed slough outlets** as a flood cause, and said their effect would be very local and not too great since the sloughs carry off little water in comparison to the main stream. He said **Swinomish Slough jetty work had absolutely no effect on the Skagit.** Clarke also minimized the effect of cutting over timber as a cause of floods. “The main cause of floods in this area,” he said, “is the appearance of storms concentrating in the area of the watershed.” **Clarke did not think that dredging the Skagit would have any great effect on preventing floods, at least in the area above the North Fork Bridge.** He dismissed as far too expensive to consider the diversion of the entire river. The engineer pointed out that Ross Dam has had a helpful effect in reducing flood levels and estimated that the most recent flood would have been one to two feet higher if the dam's reservoir had not operated as a check. “That margin,” he pointed out “could have been very serious, as you all realize.” (Source: [2/22/51 MVDH](#))

Doubt that federal aid would be forthcoming for flood control in the Skagit valley was expressed by Byron Clarke, of the Seattle office of the United States army engineer corp. . . . The question of the often discussed Avon bypass was put and Mr. Clarke contended that at present construction costs it would amount to about nine million dollars. The other alternative, repair, and improvement of the present dike and jetty system would cost in the neighborhood of five million dollars. Although the army engineer survey of the situation is not quite complete at



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his time Mr. Clarke stated that it was his belief that there would be no recommendation to the federal government for aid in any of these projects suggested. The speaker left the impression that **if anything was done** to improve the situation in the county **it would be up to the home folks**. He did say he believed the most economical plan was to repair, widen and raise the existing dikes, **both the bypass and dredging at the mouth of the river being impractical from the financial viewpoint**. (Source: [3/2/51 B.J.](#))

Hanson Creek Dredging

The problem of Hanson creek in its flooding of farmland is being studied by state and county officials, at the request of farmers owning land along the creek. . . . It was reported that at present Hanson creek has deposited so much dirt and gravel from the foot of the hill and on to its mouth at the river, that it is now too shallow to hold its water, after a heavy rain, and adjoining farmland is threatened. . . . The Soil Conservation men have conducted a survey since the meeting, and recommend a dredging of the creek bed, as in some cases the gravel is higher than the adjoining fields. . . . The farmers felt that the state should pay a large part of the cost and perhaps county help could be obtained. (Source: [3/29/51 CT](#))

Mt. Vernon Chamber Wants River Dredged

Continuing their drive to open the Skagit River to more river traffic the board of directors of the Chamber of Commerce selected a three-man "river-committee" at its noon meeting yesterday in the President hotel. Leo Beckley was appointed chairman of the committee by Ted Reep, chamber president. Andy Loft and Bob Ringman will also work on the project. . . . The Chamber initiated action last week to have the Skagit River dredged from Mount Vernon to Puget Sound. (Source: [1/24/55 MVDH](#))

Mount Vernon today renewed its long fight to win status as an inland port by creation of an all-year nine-mile \$500,000 barge route down the silt-choked channel of the Skagit river to salt water below LaConner. . . . **Receives Copies** Mrs. Anna Grimison, president of Skagit River Navigation and Trading company which currently operates shallow-draft sternwheelers on the Skagit, will receive copies of the letters to Westland and Jackson. If she indicates that river dredging will benefit river commerce, the Chamber said, a hearing will be asked with the Army engineers. The Engineers estimate that about **six miles of dredging would be necessary**, with the federal government bearing bulk of the cost if the project is approved. Approval would depend on area ability to show annual savings of at least \$350,000, the Engineers said. **The last major improvement work on the channel was completed in 1911, and dredging of the river was entirely discontinued in 1941.**⁹ Today, a government snag boat is the lone craft assigned to clear river jams. . . . **Need Justification** . . . Delta silt at the mouth of the Skagit is one of

⁹ According to Corps of Engineers records this statement is entirely false. Dredging (i.e. sidecasting) and snagging took place continuously from 1941 through 1960 with the exception of 1942 and 1943 most likely because of WWII. The majority of this sidecasting activity took place in the North and South Forks of the Skagit River. In total (including upstream of Mt. Vernon) a little over 1,000,000 cubic yards of sand was sidecast during this time period. (Source: [5/31/91 MFR](#)).



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the main obstacles to passage of all but shallow draft craft. The project won immediate support from Mount Vernon officials and industry spokesmen. “The Skagit river would become another outlet for transportation for Mount Vernon and the Chamber of Commerce should spark-plug it,” Ted Reep, Chamber president, said. . . . **Seek Schedules** . . . Channel deepening would permit extensive tugboat operations on the river. . . . **Trouble Develops** . . . Dunlap says a jetty is needed near the mouth besides dredging if the river is to stay navigable. (Source: [6/17/55 MVDH](#))

Actual Real Dredging Project Proposed – Young’s Bar

Dredging operations for fill material for the stretch of highway construction between the overpass of the Great Northern and the new bridge now in construction at Riverside probably will not get under way Monday as first planned, but will soon thereafter. . . . About a half million yards of material is to be taken from the Skagit River in the vicinity of Young’s bar by Osberg and Manson to be used on the PJ Anderson contract job. The State Highway Dept had purchased land north of Fir street in the vicinity of the cemetery for borrow materials for fill but the contractor is said to have figured costs on dredging cheaper for these materials. . . . It is understood that dredging operations have been held up for some time because of certain permits and approvals necessary, particularly from the U.S. Engineers. One source of information had it that **no dredging is to go beyond a certain depth designated as minus-five**. Some concern has been expressed as to weakening the east bank of the river but one authority said yesterday that a deepened channel might ease the wear on that bank. On the other hand it is believed that all sand and silt removed will soon be replaced by the erosive action of the river. Young’s bar has extended its reaches gradually for many years gently swinging the river eastward.¹⁰ (Source: [6/23/55 Argus](#))

Fearful of possible damage to the river pipe line across the Skagit at Riverside through dredging operations the Commissioners of PUD 1 yesterday instructed Attorney Warren J Gilbert to take all necessary steps to protect the line. . . . meeting has been held with contractors who plan to get highway building materials through dredging between the two bridges at Riverside...Commissioners took a positive stand in that no excavation or dredging at all was to be done close to the 12 inch water line under the Skagit. They pointed out that water through that line is furnished to about 10,000 persons and considerable industrial work in Burlington and Sedro-Woolley and that a cutoff of the line would necessitate at least three or four days to get more line through order and about the same time to install it..(Source: [6/30/55 Argus](#))

Dredging – The Good, The Bad, The Ugly

County Commissioner Lowell Hughes warned the Chamber of Commerce board yesterday that dredging the Skagit River could produce good or bad results to the lower Skagit Valley depending on what work was done to the river. “What you do at the mouth of the river

¹⁰ As of the writing of this paper it is unknown if this project ever went forward. No article was located which would support that it did. A half million cubic yards of material would be equal to about half of what the Corps of Engineers sidecast during the time period 1940 through 1960. Given the opposition and concerns of the project is it highly unlikely that it did.



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affects the lower valley,” Hughes said. He said that dredging the river would help in flood control, but would not be permanent since river silt would fill the bottom. A “wing dam” would be needed to create a permanent channel, but such a dam might increase the danger of floods along the lower part of the Skagit, he explained. (Source: [7/1/55 MVDH](#))

Mt. Vernon Chamber Continues Quest For Dredging

A series of letters soliciting aid in getting the Skagit River improved for better water transportation were mailed today by the Chamber of Commerce to various industries along the river. . . . Harry Grimison of the Skagit River Navigation and Trading Company, founded in 1890, said his two stern wheelers have not been able to navigate the silt filled north fork of the river for the past ten days. Jim Dunlap, speaking for the Dunlap Towing company in LaConner, said the firm towed \$2 million worth of timber down the river last year from upper Skagit County. “We brought down 32 million board feet of timber which otherwise would have been carried on the highways and there is more to come,” he said. Both men said they could only use the river at high tides to get over the delta land at the mouth of the river. (Source: [7/29/55 MVDH](#))

Mouth Of The Skagit Dredged 6-Inches Deep

The plug is about to be pulled out of the silt-filled mouth of the north fork of the Skagit River. Congressman Jack Westland, second district sent the Daily Herald the following telegram this morning: “Regarding action to improve conditions at the mouth of the north fork of Skagit River. Army engineers advise work will be undertaken immediately **to deepen channel depth about six inches.**”¹¹ This deepening will mean the difference between vessels and rafts standing or making the passage safely.” . . . “This action by the Army Engineers came as the result of work by the Chamber of Commerce which has sparked the drive to clean out the river and improve it for more use of water transport transportation,” Reep said. . . . Commercial rivermen Harry Grimison and Jim Dunlap told Chamber of Commerce Board members two weeks ago that river boats and log rafts could now get through the north fork only during high tides. (Source: [8/8/55 MVDH](#))

Dredged Channels The Answer??

The raging old Skagit (Wildcat in Indian language) has cooled down and now flows meekly along as if nothing ever disturbed it or ever will again. But the Old-timers know better. . . . Seems to us we will have to alter our plans but no doubt engineers are aware of this. Higher and stronger dikes and dredged channels no doubt are the answers. Sometimes modern

¹¹ Corps records indicate 33,270 cubic yards of sand was dredged from the North Fork in 1955. Important to note is that it had nothing to do with flood control. It was done for navigation purposes only. (Source: [5/31/91 MFR](#)).



Historical Record of Dredging On The Skagit River

conditions are not all they are cracked up to be. At least when they come to greater threats that were not so serious in the old days. (Source: [11/17/55 Argus](#))

Dredging New Channel At The Mouth Again Proposed

An emergency meeting of the Skagit County Flood Control Council has been called for Friday at 1:30 p.m. . . . to discuss feasibility of cutting a new channel at the mouth of the Skagit River. Supporters of the proposal claim that a new channel at the North Fork of the river substantially would control flooding in the Skagit flat area and open the river to navigation. . . . Hughes pointed out that the **new channel could be dredged** in a westerly direction, taking of from Valentine's Bend, across state owned land and tidal flats, and arriving at deep water, after covering a distance of about four miles. . . . County Engineer H.O. Walberg...revealed that the water level was as high at the North Fork bridge during the November 3,4, and 5 flood threat as it was during the more severe 1951 flood. Silting at the present mouth was one of the factors which accounted for this. . . . According to Asst County Engineer Harold Strombom, 147,000 cfs of water rolled down the river in 1951 high water as compared to the lesser figure of 110,000 cfs in last Novembers danger period. (Source: [12/15/55 Argus](#))

Old Man River, stay away from my door. That was the theme of yesterday's meeting of the Skagit County Flood Control Council in the Skagit County Courthouse. Over 50 persons, including representatives from 11 diking districts in Skagit County, were packed into the small courtroom to discuss the possibility of creating a new channel for the mouth of the silt - choked north fork of the Skagit River. Up-shot of the hour and a half meeting was a unanimous resolution by the council to support an emergency program with state and federal powers to dredge the new channel. . . . A proposal to cut the new channel from Valentine's Bend proceeding westerly past Bald Island to deep water was the main topic of discussion. . . . "We used to be able to enter drawing 5 feet 8 inches. Now we can't get into the river drawing 5 feet," Captain Spencer commented. LaConner area farmer Jim Hulbert said that the effect of the heavy silting was to raise the level of the mouth of the river which then backed the water upriver endangering low-lying farmland. . . . Chairman Hanson noted that the water level at the river's mouth during the Nov. 3-5 flood was as high with a 25-foot level at Mount Vernon as it was in the more serious flood in 1951 when the Mount Vernon reading was 28 feet. . . . Several of those at the meeting noted that the same idea had been proposed to the Army Corps of Engineers after the 1951 flood. "If we are going to get anything done we have got to be of one mind and get on the ball and get this thing rolling," said County Commissioner Lowell Hughes, who is a Fir Island farmer himself. (Source: [12/17/55 MVDH](#))

Corps Says No But Agrees To Study

The answer was no, but they're not done yet. Such was the feeling yesterday of the eight men from Skagit County as they left the Seattle District Army Engineers headquarters in Seattle after having their proposal to declare an emergency to have a new channel in the mouth of the Skagit River turned down. . . . **Gives Resolution** Hughes presented resolutions from the 11



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dike districts in Skagit County to Col. Norman A. Matthias asking that the work be done in order to provide a faster runoff of the Skagit's water and lower the river level by a foot more. "You can't realize how important the difference of a few inches on the dikes during a flood mean to us," commented Hughes. Members of the colonel's staff pointed out that their studies showed that the river bottom of the Skagit has remained more or less stable in the past 18 years. . . . **Funds Sought** . . . George Kurttilla, civil engineer for the Army in the planning section for navigation projects, pointed out that their office has a report on flood control and navigation made on the Skagit now in Washington D.C. before the Chief of Engineers. He said action is expected on the report in the next two years. . . . Kurttilla said that some of the main recommendations in the report were for extension and raising of the dikes from Burlington down to the mouth of the river. **Agree to Study** In addition to this information, the Army Engineer agreed to have his staff make a comparative study of 1937 soundings of the river and the tide flats as against those taken in July, 1955, and forward the report to the Skagit County engineer, H.O. Walberg, next week. (Source: [1/6/56 SVH](#))

River Dredging Study Backed

The Waterways Association meeting in Portland Nov. 21 and 22, passed the Skagit resolution along with 31 other resolutions backing various waterways proposals, mainly on the Columbia River. . . . "The Skagit Valley already has exceptional natural advantages that favor economic growth." U.S. Army Engineers would make the river study, determining if navigation would justify its cost, explained Magnuson. A report on the study would be submitted to Congress "at the earliest possible date," he continued. Brief initial studies have indicated navigation on the Skagit will show economic justification, engineering soundness and relatively minor dredging costs, Magnuson recalled. (Source: [12/1/60 SVH](#))

Funds to study dredging of the Skagit River from the Sound to Concrete, **for navigation**, may be asked of the next Congress, Senator Warren Magnuson has advised Leo Sullivan, chairman of the Mt. Vernon chamber of commerce industrial committee. . . . The project, said Sullivan, "has hearty endorsement from 36 business firms and chambers of commerce in the area," as well as the waterways association. . . . He said brief initial studies have indicated economic justification for the project could be shown and it would be engineering-wise sound. (Source: [12/1/60 Argus](#))

Funds for complete study of the feasibility of dredging the Skagit River will be asked at the next session of Congress. Such a study would be made by the Army Corps of Engineers to appraise the economic benefits and estimate federal costs entailed in dredging the existing course and channel of the river for shallow barge transportation. (Source: [12/1/60 B.J.](#))

State Senator Fred J. Martin today disclosed he has written a letter supporting the dredging of the Skagit River as far east as Concrete to permit the stream's use by shallow draft vessels and barges. . . . IN HIS letter, Sen. Martin listed five reasons for his support of the dredging proposal. They are as follows: 1. Dredging will "substantially lower the cost of transporting cement from the plant at Concrete to market and enable it to better compete with other plants more centrally located and will perhaps insure that the Lone Star Cement Plant at



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Concrete can operate full time, which it is unable to do at the present time because of the handicap of high freight rates.” 2. Dredging will “make feasible and profitable the transportation of lime rock from the large deposits in the Upper Skagit Valley to various other cement plants in the state.” 3. “It will make profitable the mining and transportation of marble, silica, talc, olivine and other non-metallic ores of which there are large deposits in the Upper Skagit Valley.” 4. “It will lower the cost of transporting alder, cottonwood, maple and other pulpwood varieties from the Upper Skagit Valley to markets.” 5. “The dredging of the Skagit River channel would have immense value for flood control as it would greatly reduce stream-bank erosion above Sedro-Woolley and thereby substantially reduce siltation of the river bed from Sedro-Woolley to its mouth.” (Source: [1/23/61 SVH](#))

Recently it was announced that money had been appropriated in Congress for a survey of the Skagit River by Army engineers. Purpose of the study would be to determine the feasibility of dredging the stream for shallow barge transportation. To many people the full import of this project may be lost in the present day era when government survey funds are allocated for a multitude of programs ranging from rehabilitating the gooney bird to effecting world-wide birth control. It should be pointed out, however, that the proposed dredging of the Skagit is not just another crackpot scheme or a ridiculous proposal fostered by dreamers. On the contrary, the possibility of opening the Skagit for limited navigation is most real, the need most pressing, the potential most exciting and the impact on the economy of this region most promising. . . . In the vast regions of its headwaters lie timber, minerals and rock deposits, many of them virgin assets that call for dependable, economical transportation to market before they can be put to use. . . . Unlimited deposits of some of the finest limestone rock to be found anywhere in the world are located nearby. . . . Transportation by river barge would cut deposit-to-plant costs and mean more business and jobs for Skagit County. Limestone is but one of the many raw materials that might find its way down the river once the stream was deepened for navigation. Added flood control and soil conservation could be considered bonus benefits that would automatically ensue. (Source: [3/16/61 B.J.](#))

Funds for a study were in fact obtained and culminated in a “Feasibility Study” of dredging a 6 foot deep 100 foot wide barge channel from Mt. Vernon to Concrete, published on January 18, 1963. Dredged material was to be “deposited within the banks of the high water channel, but as far outside the dredged channel as possible.”¹² No attempt would be made to maintain the dredged channel at a fixed location, but as streambed conditions changed, maintenance dredging would be accomplished along the most favorable alignment.” (Source: ¶14 *Feasibility Report, Skagit River, Washington (Navigation), Corps of Engineers, 1/18/63*)

The amount of material to be dredged was 1,520,000 cubic yards at a cost of approximately \$1,578,000. (Source: ¶21 *Feasibility Report, Skagit River, Washington (Navigation), Corps of Engineers, 1/18/63*) The benefit cost ratio (\$592,000 annual benefits vs. \$474,000 annual cost) was 1.25 to 1. (Source: ¶29 *Feasibility Report, Skagit River, Washington (Navigation), Corps of Engineers, 1/18/63*) However, the study recommendation was as follows: “The Skagit River navigation study has been authorized and intermittently underway since 1947. In view of this fact, the favorable benefit-cost ratio based on limited field surveys,

¹² This fits the definition of sidecasting.



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and the importance of the proposed project to the local county, an effort should be made to complete the study as soon as practicable. Therefore, the District Engineer recommends that a minimum of \$16,000, in addition to funds presently available, be allocated to the Skagit River Navigation Study not later than 1 March 1965, and the remaining \$15,000 needed to complete the study be allocated early in Fiscal Year 1964. (Source: ¶31 Feasibility Report, Skagit River, Washington (Navigation), Corps of Engineers, 1/18/63)

Opposition To Dredging Navigational Channel

A new campaign in the continuing war between conservationists and proponents of industrial development is threatening to break out on the Skagit River. The focus of developing controversy is the proposed dredging of a 100-foot wide channel, six feet deep, to Concrete. The channel would open the river to tug and barge traffic and connect valley towns to salt water. With a stagnant economy, Skagit County sorely needs to strengthen existing payrolls and to develop new employment opportunities. Initially the navigable channel would create new activity at Lone Star Cement Company's upriver limestone quarry. . . . Alarmed that fish spawning grounds will be disturbed, the state Game and Fisheries Department has made an official protest, pointing out that roughly a third of Skagit River's Chinook Salmon are spawned in the area of the proposed dredged channel. . . . We don't pretend that a dredged channel will not have some small effect on fish spawning despite adequate safeguards. There has to be a reasonable amount of compromise on the part of fish conservationists in order for Skagit County to enjoy vitally necessary economic growth. The conflicts that may seem to exist can most certainly be resolved by calm and constructive approach to the problem by all concerned interests. (Source: [7/23/63 SVH](#))

As to flood control, Col. Garbacz pointed out that while the proposed Avon By-Pass would provide "partial protection," the US Engineers felt this and existing levees would not give all the flood protection needed in the lower areas of the Skagit. The "ultimate solution" he said, "is to provide some type of reservoir upstream from the lower valley areas. **Sauk Site Considered**—Later in the interview the engineers spokesman said superficial examinations had been made on the Sauk river about seven miles upstream from the Skagit as a possible dam site. He called it "premature to say that site is a good site." **Dredging**—The engineer did not duck the issue of potential damage to fish life from the proposed dredging of the Skagit channel between Mt. Vernon and Concrete for barge navigation. Sports groups have voiced great concern that such channel work would ruin spawning grounds and wipe out steelhead and salmon runs in the river. **Fish Studies Promised**--..."we are very much aware of the problem that dredging in that stretch of the river might cause to fishing" and promised that "we will have the fisheries experts of the state and federal agencies go into it a little bit later on. . . . **Present thinking of the engineers is to have a river channel four to six feet deep and about 100 feet wide**. "Dredging alone doesn't bother the run so much as it does the spawning of the sea-run fish. This is the particular concern I think that the sportsmen out there have and so does the Corps." (Source: [8/1/63 Argus](#))



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Navigational Study Dies

The Skagit River is no longer considered a navigable river by the Corps of Engineers, North Pacific Division, Department of the Army. This is not an overnight decision considering the report released this week read: “Notice is hereby given that the report on Skagit River, Washington, **for navigation**, authorized by resolution of the Committee on Public Works of the House of Representatives adopted 13 May, 1947, has been completed by the District and Division Engineers. The **report is unfavorable to the improvement**. A public hearing was held at Mount Vernon, Washington on 12 April 1949.” At issue was the feasibility of improving Skagit River **for navigation** by dredging from deep water in Skagit Bay upstream about 54 miles to the vicinity of Concrete. This week’s report stated that officers engaged on the project find that the estimated transportation savings “would be insufficient to justify the estimated cost of improvements.” (Source: [10/22/65 B.J.](#))

The request of a county group for opening of the Skagit River to navigation as far as Concrete, made at a public hearing in Mount Vernon last April, has been given an unfavorable report by the North Pacific Division of the Corps of Army Engineers. The study made by the engineers was the feasibility of improving the river for navigation by dredging from deep water in Skagit Bay upstream 54 miles to the Baker river at Concrete. The engineers found that the estimated transportation savings would not be sufficient to warrant expending the amount of money necessary for the project. (Source: [10/21/65 C.H.](#))

Personal Opinion

Based on a review of the verbiage contained herein I feel that one can conclude several things. We can conclude that approximately 1,000,000 cubic yards of material was dredged by means of sidecasting between 1940 and 1960 (Source: [5/31/91 MFR](#)), however the material dredged was not disposed of outside the main channel, thus every time we had another freshet, the material was washed back into the river.

We can conclude that all of the dredging activity and/or studies were done solely for navigational purposes and not flood control. (Sources: [12/4/23 MVDH](#), [12/6/23 Argus](#), [4/12/38 CT](#), [8/8/55 MVDH](#), [12/1/60 Argus](#), [12/1/60 B.J.](#), [1/23/61 SVH](#))

The record is clear that the Corps of Engineers refused to spend any money on dredging for flood control and that the dredging of the entire Skagit River was inadvisable. (Sources: [6/14/34 CT](#), [5/6/37 MVDH](#), [2/22/51 MVDH](#), [3/2/51 B.J.](#), [1/6/56 SVH](#), [10/22/65 B.J.](#))

The issue of dredging has been recommended, opposed, studied and denied on many occasions throughout Skagit County’s history. (Sources: [5/13/37 Argus](#), [6/5/37 MVDH](#), [6/10/37 Argus](#), [10/28/37 CT](#), [3/17/49 Argus](#), [12/22/49 Argus](#), [2/22/51 MVDH](#), [3/2/51 B.J.](#), [1/24/55 MVDH](#), [6/17/55 MVDH](#), [7/1/55 MVDH](#), [7/29/55 MVDH](#), [12/15/55 Argus](#), [12/17/55 MVDH](#), [12/1/60 B.J.](#), [12/1/60 Argus](#), [1/23/61 SVH](#), [3/16/61 B.J.](#), [7/23/63 SVH](#), [8/1/63 Argus](#), [10/22/65 B.J.](#))



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There was one actual private enterprise dredging (i.e. the removal of the material from the river channel) project proposed however there was nothing in the written record observed that the project ever went forward. (Sources: [6/23/55 Argus](#), [6/30/55 Argus](#),)

We know from a review of the historical record that dredging the mouth of the river will have no impact on floods due to the tides. (Source: [11/5/36 MVDH](#))

Finally we know the following:

Deepening the Skagit River to carry flood flows is not feasible. Substantial deepening of the river to carry flood flows would tend to undermine existing levees along the river banks and thereby require costly erosion protection measures. The Skagit River carries large quantities of bed sediment estimated at more than 500,000 cubic yards annually. A deepened channel would require maintenance dredging of a sediment basin above the improved reach of the river at an estimate of at least \$200,000¹³ annually. In addition major dredging of more than 20 miles of river channel would be necessary for increased channel capacity as well as set back of levees at the mouth of the river, channel excavation and maintenance to carry flood flows would have an extremely adverse effect on the salmon and steelhead trout fishery resource. Because the Skagit River is the most important river in the entire Puget Sound area for salmon and steelhead spawning and for sport fishery, any major dredging of the river would be totally unacceptable to fishery interests. For these reasons channel deepening was considered impracticable and cost estimates were not made for this plan. (Source: ¶9a. Page 5, *Supplement To Review Report on Flood Control and Other Improvements On Skagit River, Washington, Corps of Engineers, March 1966*)

* Dredging the river to convey the 100 year flood would require over a 10-20 foot dredge depth from the mouth to Sedro Woolley, 20 miles (of at least) 60,000,000 cu. yds.)

* Short term fix to the problem and would have a high O&M (Operation and Maintenance) cost.

* Severe impact to fish habitat . . . due to ongoing maintenance. Migration of fish would be impacted. (Source: *E-mail dated 4/5/2001 Skagit Feasibility Analysis, Stephen Pierce, COE*)

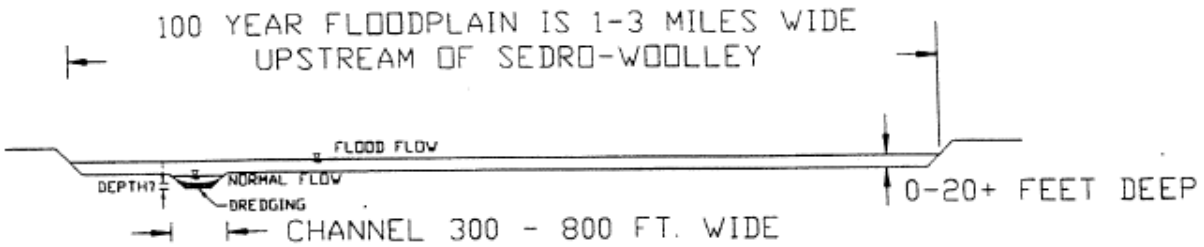
One of the things the above e-mail left out was that the integrity of the current levees would be severely compromised.

Above Sedro-Woolley dredging the Skagit River would be infeasible due to the depth it would have to be dredged in order to carry the 100 year flood. This statement is best demonstrated by the following graphic:

¹³ According to the Consumer Price Index, this \$200,000 figure in 1966 would be \$1,163,000 in 2004.



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(Source: Skagit County Public Works Department)

Now how deep do you think you would have to dredge the Skagit River above Sedro-Woolley in order to accommodate 1 to 3 miles of water? Enough said about dredging.

"We investigate the past not to deduce practical political lessons, but to find out what really happened." *T. F. Tout (Professor of Medieval and Modern History 1855-1929)*



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Appendix A

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
Washington, D.C. 20314

EM 1110-2-5025

DAEN-CWE-HD

Engineer Manual
No. 1110-2-5025

25 March 1983

Engineering and Design DREDGING AND DREDGED MATERIAL DISPOSAL

3-6. Sidecasting Dredges.

a. General. The sidecasting type of dredge (fig. 3-9) is a shallow-draft seagoing vessel, especially designed to remove material from the bar channels of small coastal inlets. The hull design is similar to that of a hopper dredge; however, sidecasting dredges do not usually have hopper bins. Instead of collecting the material in hoppers onboard the vessel, the sidecasting dredge pumps the dredged material directly overboard through an elevated discharge boom; thus, its shallow draft is unchanged as it constructs or maintains a channel. The discharge pipeline is suspended over the side of the hull by structural means and may be supported by either a crane or a truss-and-counterweight design. The dredging operations are controlled by steering the vessel on predetermined ranges through the project alignment. The vessel is self-sustaining and can perform work in remote locations with a minimum of delay and service requirements. The projects to which the sidecasters are assigned for the most part are at unstabilized, small inlets which serve the fishing and small-boat industries. Dangerous and unpredictable conditions prevail in these shallow inlets making it difficult for conventional plant to operate except under rare ideal circumstances.

b. Description of Operation. The sidecasting dredge picks up the bottom material through two dragarms and pumps it through a discharge pipe supported by a discharge boom. During the dredging process, the vessel travels along the entire length of the shoaled area casting material away from and beyond the channel prism. Dredged material may be carried away from the channel section by littoral and tidal currents. The construction of a deepened section through the inlet usually results in some natural scouring and deepening of the channel section, since currents moving through the prism tend to concentrate the scouring action in a smaller active zone. A typical sequence of events in a sidecasting operation is as follows:



Historical Record of Dredging On The Skagit River



Figure 3-9. Sidecasting dredge.

- (1) The dredge moves to the work site.
- (2) The dragarms are lowered to the desired depth.
- (3) The pumps are started to take the material from the channel bottom and pump it through the discharge boom as the dredge moves along a designated line in the channel prism.
- (4) If adequate depths are not available across the bar during low tide levels, dredging must be started during higher tide levels. Under these conditions, the cuts are confined to a narrow channel width to quickly attain the flotation depth necessary for dredging to be continued during the low tidal periods.
- (5) The dredge continues to move back and forth across the bar until the channel dimensions are restored.
- (6) The discharge can be placed on either side of the dredge by rotating the discharge boom from one side of the hull to the other.

c. Application. The Corps of Engineers developed the shallow-draft sidecasting dredge for use in places too shallow for hopper dredges and too rough for pipeline dredges. The types of materials that can be excavated with the sidecasting dredge are the same as for the hopper dredges (para 3-3c).

d. Advantages. The sidecasting type of dredge, being self-propelled, can rapidly move from one project location to another on short notice and can immediately go to work once at the site. Therefore, a sidecasting dredge can maintain a number of projects located great distances from each other along the coastline.



Historical Record of Dredging On The Skagit River

e. Limitations. The sidecasting dredge needs flotation depths before it can begin to work because it dredges while moving over the shoaled area. Occasionally, a sidecaster will need to alter its schedule to work during higher tide levels periods only, due to insufficient depths in the shoaled area. Most areas on the seacoast experience a tidal fluctuation sufficient to allow even the shallowest shoaled inlets to be reconstructed by a side-casting type of dredge. A shallow-draft sidecasting dredge cannot move large volumes of material compared to a hopper dredge, and some of the material removed can return to the channel prism due to the effects of tidal and littoral currents. The sidecasting dredge has only open-water disposal capability; therefore, it cannot be used for dredging contaminated sediments.