COPY

Sections 3.2 and 3.3

Historical Reconstruction of the Coquille River and Surrounding Landscape

Photograph: Steamboat plying the tidal section of the Coquille River, ca. 1900 (Courtesy and in memory of Curt Beckham, a Coos County resident and historian, Beckham collection).

Prepared by Patricia Benner

Benner, Patricia A., 1991. "Historical Reconstruction of the Coquille River and Surrounding Landscape." In: *Near Coastal Waters National Pilot Project: The Coquille River, Oregon.* "Action Plan for Oregon Coastal Watersheds, Estuary and Ocean Waters, 1988-91." Prepared by the Oregon Department of Environmental Quality for the U.S. Environmental Protection Agency, Grant X-000382-1.

Acknowledgements

We would like to thank the Port of Bandon, Port of Coquille, Bandon Historical Society, Coos County Logging Museum, Douglas County Museum, Oregon Historical Society, Coos County Historical Society, the U.S.D.A. Forest Service, the Oregon Department of Environmental Quality, Environmental Protection Agency, Horner Museum, the Portland office of the U.S. Army Corps of Engineers and its personnel, Jim Sedell, Kelly Burnett, Krystyna Wolniakowski, Curt Beckham, Nellie Palmer, Pete Peterson, Paul Wiley, Gordie Hays, Alex Linke, Kay Linke, Kevin Shear, Bob Zybach, Ken Bierly, Jay Nicholas, Tony Howell, Coquille Advisory Committee members, and all of the other agencies and people who provided support, or who each in his or her way made it possible to successfully conduct historical work on the Coquille River and prepare this report.

Historical Reconstruction
of the Coquille River and Surrounding Landscape

Table of Contents

		Page
3.2	**Historical Bottomland Landscape Inventory**	
	Introduction	3.2-2
3.2.1	Materials and Methods for the Reconstruction and Evaluation of the Coquille Historical Landscape.	3.2-6
	• Historical Data Base	2-6
	• Using Historical Land Surveys	2-8
	• Historical Landscape Reconstruction	2-12
	• Additional Methods	2-17
3.2.2	Historical Marshlands and Adjacent Upland Landscape.	3.2-18
	• Bottomland Historical Landscape	2-18
	• Current-day Bottomland Landscape	2-28
	• Influence of Historical Marshlands	2-28
	• Marsh Prairie Discussion	2-29
	• Timbered Swamp with a Brushy Understory	2-31
	• Timbered Marsh with a Grass Understory	2-33
	• Beaver in Marsh Areas	2-34
	• Timbered, Drier Bottomlands	2-37
	• Individual Areas Discussion	2-37
	• Historical Surveyors' Perspectives on Land Use	2-41
	• Upland Forest Description	2-42
	• Surveyors' "General Descriptions"	2-47
3.2.3	Historical Bottomland Streams and Flooded Marshlands Associated with the Tidal Section of the Coquille River.	3.2-53
	• Tributary Bottomland Streams	2-57
	• Flooded Marshlands	2-60
	• Historic Habitat in Marsh Bottomlands	2-62

Historical Reconstruction of the
Coquille River and Surrounding Landscape
Table of Contents (cont'd)

		Page
3.3	**Historical Wood, Dredging and Splash Dams**	
3.3.1	Historical Presence and Removal of Large Wood from the Coquille River.	3.3-1
	• Documentation of Historical Downed Woody Debris in Coastal Rivers	3-1
	• Source Material for Tidal Wood	3-5
	• Historical Removal of Channel Wood and Source Material	3-8
	• Recent River Mouth Woody Debris Survey	3-13
3.3.2	The Roles and Impacts of Large Wood in the Coquille River and Its Tributaries.	3.3-16
	• Physical And Biological Functions	3-17
	• Wood in Tidal Rivers	3-20
3.3.3	Channel Depth and Dredging History in the Tidal Section of the Coquille River.	3.3-22
	• Information Sources	3-22
	• Early Surveyor Comments	3-22
	• Head of Tide	3-23
	• Dredging in the Tidal Coquille above Coquille City	3-24
	• The Tidal Coquille Below Coquille City	3-35
	• Port of Coquille Dredging Efforts	3-37
	• Floods and Related Historical Events	3-40
3.3.4	Splash Dams and Channel Changes on the Coquille River above Myrtle Point, Oregon.	3.3-48
	• Splash Dam Operations	3-49
	• Bank Vegetation Clearing Activities	3-57
	• Ecological Impacts	3-67
3.3.5	"Nancy's Pinch": An Historical Case Study on the Coquille River, Oregon.	3.3-75
	References (Sections 3.2 and 3.3)	3.3-81

Historical Reconstruction of the
Coquille River and Surrounding Landscape
Table of Contents (cont'd)

3.3.6 Attachments

		Page
Appendix 1.	Original Survey Notes Descriptions of the Coquille Landscape Data.	3.3A-1
Appendix 2.	Draft Maps of Vegetation Data from the Original Land Survey Notes: T28S R13W.	3.3A-22
Appendix 3.	Data Table: Original Land Survey Notes Tree type, Diameter, size and location for Township 28 South, Range 14 West.	3.3A-73
Appendix 4.	U.S. Army Corps of Engineers Snag Removal Description Data: 1883-1925.	3.3A-85
Appendix 5.	Excerpts: Comments from U.S. Army Corps of Engineers Annual Reports to Congress regarding Depth and Dredging Data.	3.3A-89
Appendix 6.	Coquille River Section Line Channel Widths from the Original Land Survey Notes: 1857 - 1872.	3.3A-109
Appendix 7.	Listing of U.S. Army Corps of Engineers Channel Depth Record Maps.	3.3A-119
Appendix 8.	Fish Export Statistics Over the Coquille Bar as reported by the U.S. Army Corps of Engineers: 1882-1918.	3.3A-121

Introduction

Estuaries attracted early settlement along coastal rivers in Oregon because they offered the physical characteristics of natural ports. This included the Coquille River located in south-western Oregon (Figure 3.2.1).

The Coquille also offered over 40 miles of tidally influenced river, exceeded in length in Oregon only by the Columbia River. It offered a deep channel that was not subject to low summer flow depths. This feature was especially attractive during the 1800s when the only practical means of year-around transportion was by boat. The Coquille did, however, lack a consistantly safe river entrance, but the U.S. Army Corps of Engineers dredged the bar and constructed jetties which narrowed, deepened and stabilized the river mouth entrance (Figure 3.2.2).

In addition to the natural navigable character of the Coquille River, the Coquille Valley was especially attractive to Euro-American settlers in that it offered broad alluvial valley floor for cultivation, a moderate climate, and a wealth of timber and other natural resources. It did not take much encouragement to initiate settlement of the valley. Word spread, the land was surveyed, and in fewer than thirty years the valley was transformed as towns and farms were established.

This portion of the Coquille study reconstructs features of the Coquille area historical landscape, and ways in which aspects of the river and associated lands have been modified since settlement in the mid-1800s.

Elements of this historical material may include information that might already be common knowledge to some individuals, especially whose family members have lived in the Coquille Valley since it was settled. Indeed, this report would not be as complete if it were not for the people of the Coquille area. Historical information that is of common knowledge to some, however, may be unknown to others, and is at risk of being lost forever. This product will hopefully be a tool for people who live and/or manage a resource in the Coquille area, be it related directly to the river, or the associated segments of the landscape, and will encourage others preserve and recover historical material.

With respect to the landscape and its features and resources, each individual's perspective on what is a "natural" or a pristine landscape is often based on a personal lifetime experience. That perspective may be somewhat modified through our parents' or grandparents' accounts, but many of the features of the historical landscape are not part of a professional and personal working knowledge. Historical reconstruction of

Coquille River Basin

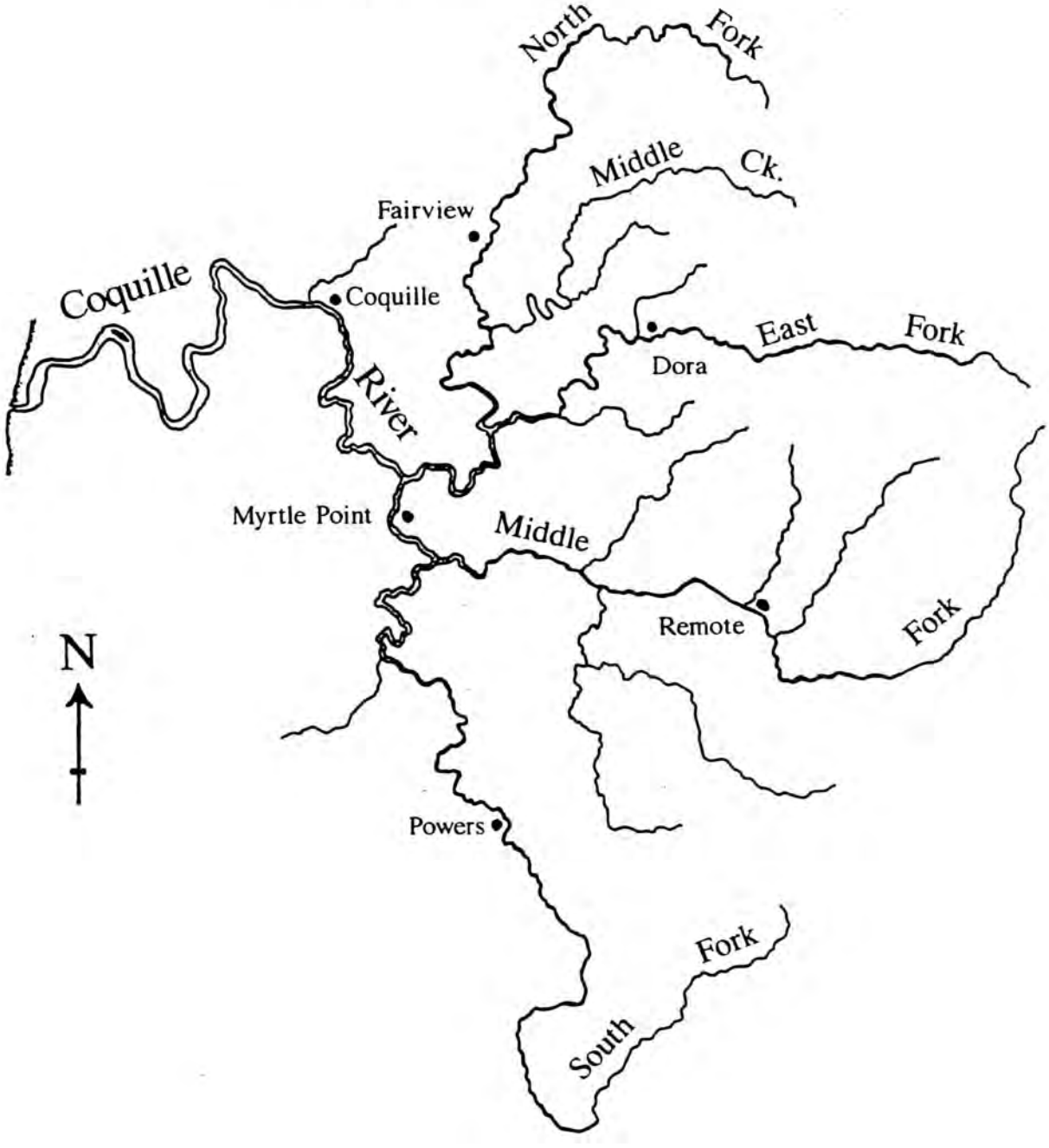


Figure 3.2.1. Basin map of the Coquille River, Oregon. From Division of State Lands, August, 1979.

features or characteristics of a landscape provides baseline datathat reaches beyond lifetime experiences.

Riverine systems closely interact with their associated bottomlands and watersheds. Anthropogenic activities have occurred since settlement of the Coquille area that have altered the structure and functioning of the Coquille landscape, including the structure and functioning of the river and its interaction with the land. A better understanding of the features of this landscape prior to this modification, provides a context for the conception of effective strategies and superior products, be it in basic ecological research, fisheries or other resource "management," or the restoration or creation of wetlands for water quality.

Landscapes naturally change over time; the Coquille River channel has laterally migrated from one area of the valley to another. Several million years ago the Coquille Valley floor was under ocean waters. Forest fires, both natural and man-made, prior to the first Euro-American settler altered the vegetational communities. The features of a landscape cannot necessarily be relied upon to be stationary or static. The appearance of stability of a particular feature depends on the time frame under discussion. It also depends on the forces which mold the feature, and the resiliance of the "building materials" of that feature. A section of the Middle Fork channel carved in rock will be constrained, but the Coquille River mouth, traveling through sand and gravel to reach the ocean regularly changed location prior to the jetties.

The mid-1850s aboriginal landscape of the lower Coquille River is not necessarily preferable to any other landscape that may have existed in this valley over time. It is the understanding of its features and characteristics, however, in conjunction with a knowledge of the modifications that have altered the landscape's form since the 1850's, that is a valuable tool in the protection, reclamation, or utilization of resources. It is only if a target resource, such as agricultural land or timber, is considered to be within the broader context of a *resource web within a landscape*, will all resources continue to be available in a sustainable manner.

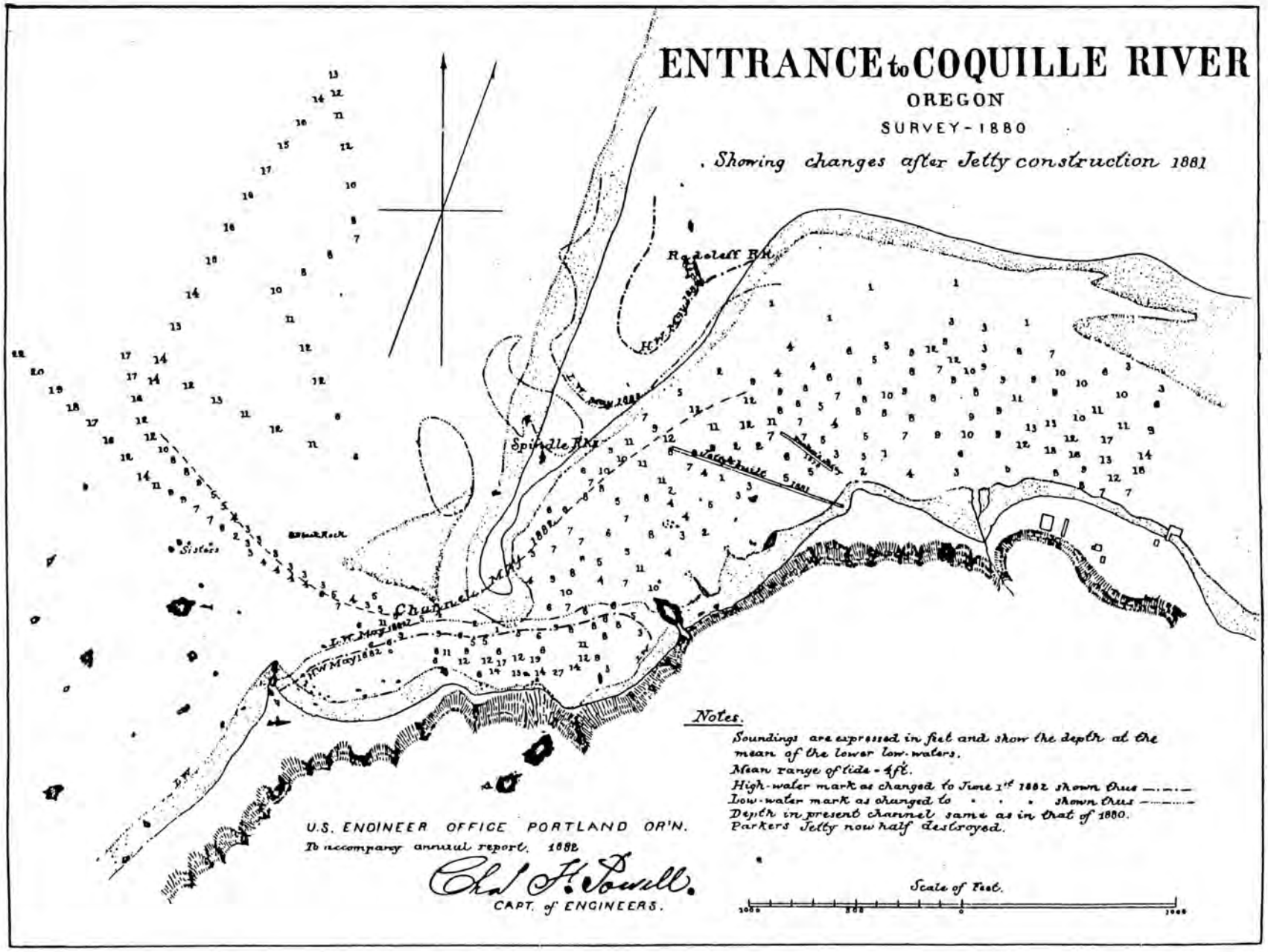


Figure 3.2.2. Map of the Coquille River Mouth, Oregon. First Jetty Work on the Coquille by the U.S. Army Corps of Engineers, 1881. In: House Executive Documents, 1st Session, 48th Congress, Vol. 5, 1883-84.

3.2.1 Materials and Methods for the Reconstruction and Evaluation of the Historical Landscape

An historical context is invaluable when exploring a research topic. Even though historical landscape research involves a variety of techniques and practice, it can be easily and quickly mastered. One of the most important factors in this work is perseverance. The products of creative sleuthing for historical material provide an insightful framework for research investigation, analysis, and ultimately resource management.

General descriptions of historical landscape features are more prevalent than quantifiable data, and often even the common features of the historical landscape were not recorded. This is more understandable when one considers what an individual today might elect to write in a personal journal. Features common to the current landscape, and daily experiences would probably not generally be considered worthy of note. For the same reasons, common historical landscape characteristics and activities were ignored in many early accounts by visitors and occupants.

Many of these commonly occurring features were not mentioned unless they made a significant difference in the events of the day. Large pieces of drift wood found along the Oregon coast were not included in Talbot's journal until he and his party were able to use it to raft across a bay (Haskin, 1958). Lewis and Clark mentioned the volume of large drift wood in the Columbia River only after pieces threatened to demolish the canoes and crush the party during a November storm.

Historical Data Base

Quality historical reconstruction work requires verification of the historical material by comparing and contrasting several information sources, and placing the available information within a broad interpretive context. The researcher should be as objective as possible in the interpretation of this historical information. Intuition, however, should be appreciated as a valuable complementary research tool.

For example, it is important to consider early authors' reasons for reporting the historical data, their ability to report observations, and what preconceptions and biases influenced them. In addition, most historical documents were not often written with the same goals in mind as the ones for which the information will be currently used. Without taking these factors into consideration, it is easy for modern researchers to support any conclusions they choose (Sedell & Luchessa, 1982).

Sources of information are to some extent unique to each historical project. However, historical information regarding rivers and their associated landscapes can be obtained from one or more general types of sources: descriptive accounts of individual streams or rivers, records not primarily concerned with streams or rivers but that happen to include relevant information in the context of human activities, and descriptions and statistical information that were often related to river-associated governmental activities compiled by State and Federal agencies. An example of the first would be the Original Land Survey notes, the second a Hudson Bay Company trapper's journal written during an exploratory trip, and the third a port authority's annual accounts of shoals and dredging activities on a river. Such a simplistic summary of sources of historical information in some ways falls short of listing the wealth of historical material that can be available. The challenge is to find it.

Both descriptive accounts and statistical information regarding river and land-related features can be found in government documents such as Original Land Survey Notes; U.S. Army Corps of Engineers Reports, if the river of study was a major navigable waterway; U.S. Coast Surveys; and Original Soil Survey maps and notes. The U.S. Army Corps reports also provide extensive information concerning activities associated with channel use and modification, and other interesting tidbits such as sedimentation.

The Public Utilities Commission, county courthouses, port authorities, the BLM, Forest Service and State Forestry Departments, Oregon Division of State Lands (or a comparable state agency), and State Fisheries Departments can be productive sources of information. Some visits to these agencies will seem to be useless dead ends unless an employee can be located who has either worked with the agency for a number of years or is knowledgeable of the agency's archives. Several visits to an agency can be worthwhile, one fairly early during the research project, and later as the project develops and one has a larger context from which to conduct information gathering.

Aerial photographs, first produced in about 1939, are often available and provide a time sequence of a variety of data. Counties, public land agencies such as the Bureau of Land Management or the State Forestry Department, and the U.S. Army Corps of Engineers have all flown portions of the Northwest, and many of the photographs can be purchased. The U.S. Army Corps of Engineers Portland office, for example, currently maintains an extensive Northwest photographic library. This project's aerial photographs almost exclusively came from the Corps photographic collection because of the suitable scale of the photographs. The original purpose of the photography was to examine the river, and so the photographs were well suited for this work.

Interviews with individuals who have lived for years in the area can also be valuable, although at best their personal experiences will date back to the early 1900s. Many will also have old photographs that date back even later, diaries, and plenty of information on leads to other sources of information.

Historical museums archive old photographs and historical documents. The Oregon Historical Society, local and county museums such as, in this case, the Bandon Historical Society, the Coos County Historical Museum, and the Coos County Logging Museum in Myrtle, were all of help.

Some of the historical research did not prove productive within the time constraints of this project. The investigation work done in preparation for reconstructing early timber cutting history did not produce satisfactory material. Most of the early timber cuts were on private lands, and so were difficult to reconstruct. The Coos County tax records that would have included timber sales were located in the courthouse, but were in the archives and not feasible to sort through with the time available. The Powers Ranger Station has kept timber cutting records for the Forest Service lands in a system called "TRI". That material is a good source of data for recent timber cutting records, but would have also taken a significant amount of time to organize. Timber cutting data for the Coquille area might have been found in the Weyerhauser archives, and other private lumber companies' records, and will be pursued at some future date.

Using Historical Land Surveys

Survey notes can provide one of the few excellent sources of historical data, and did so for a significant amount of the early Coquille landscape. The surveyor and crew walked the section lines of each township, noting natural features and setting survey marker posts at designated locations. Each township was 36 square miles in area, and was divided up into square mile sections (Figure 3.2.1.1).

The surveying crew would first walk the exterior lines or boundary of the township, then generally walk the lines which formed the boundaries for the sections within the township. A township was named and numbered for its location north to south (example: "Township 28 South"), and then its location east and west (example: "Range 14 West"). The location of each township within the Coquille area was also relative to the "Willamette Meridian."

Township and Adjoining Sections Diagram

One Section = 1 Square Mile

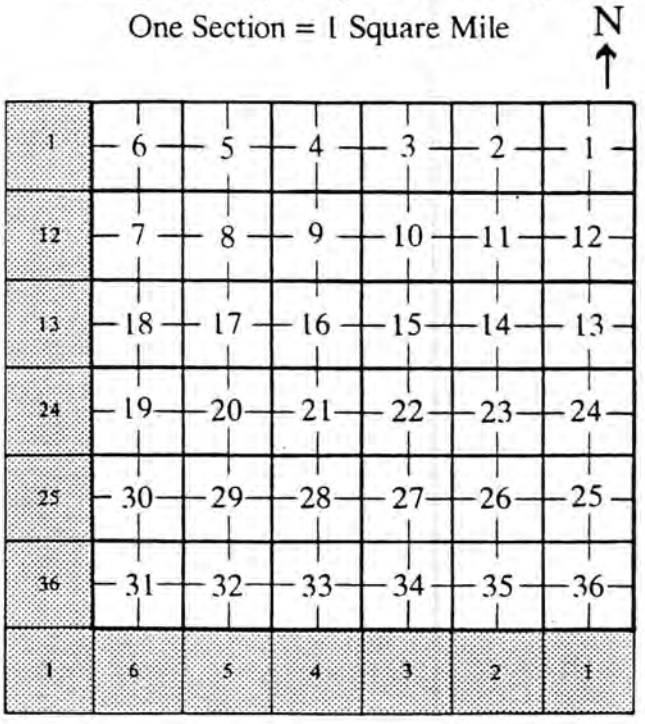


Figure 3.2.1.1. A Township is composed of 36 sections, each one square mile in size (adjoining township sections are stippled.)

In a few instances historical survey notes may have been a "dry lab" effort, the product of a creative surveyor who "surveyed" from his tent as it rained. For the most part, however, the early survey work was amazingly accurate, especially considering the terrain, the presumed weather, and the "briers."

A good deal of the survey work on the lower Coquille was done from about May through October. A small portion of the work was done during the winter/spring rainy season. Seasonal surveying appears to have been the typical style of most surveyors. However, the season that the survey work was done is an important factor to consider when historical survey notes are used as a source of information.

The document, "Instructions to Surveyor of Public Lands in Oregon, 1851," written by John M. Moore, was the manual of field operations for the surveyors who created the survey notes that were used in the Coquille study. This manual instructed the surveying party on standard guidelines for the "making of surveys." A copy of this manual can be found in a current publication, A Collection of Original Instructions to Surveyors of the Public Lands, 1815-1881.

Survey boundary corners were marked by a tree if one was in that precise spot. More commonly, a post was cut and planted in the ground at the corner. When trees were present, four were used as **"bearing trees"** (witness trees) as a method of marking the locations of these survey corners. The manual instructed the surveyors to position these bearing trees as follows:

> **"At all township corners, and at all section corners, on range and township lines, four bearing trees are to be marked [with a blaze]..., one in each of the adjoining sections."**
>
> **"From quarter section and meander corners two bearing trees are to be marked, one within each of the adjoining sections."**

The surveyors were required to mark in their field books "the kind and diameter of all 'bearing trees,' with the course and distance of the same from their respective corners." These data are therefore available for general information of the types of vegetation at that time.

The bearing trees listed in the original land surveys are not to be considered a random sampling of the timber species or size. Surveyors apparently selected trees based on several factors. The type of bark affected the degree of difficulty of scribing a tree, and so certain species were probably more attractive to the surveyors.

It also can't be assumed that bearing trees were necessarily representative of the largest or smallest in the area. Several contemporary surveyors have confirmed that a tree from 6 inches to 12 inches in diameter is preferable, because a smaller tree might not survive the bark damaging blazing, and that many trees larger than twelve inches in diameter have bark that was more difficult with which to work (Parsons, 1990, & Coos County Survey Office).

Distance from the post corner was another factor which determined the choice of tree. A tree which was reasonably close in proximity to the post was preferable, though probably bearing trees needed to be at least a short distance from the post so that the bearing angle would effectively direct a searcher to the post. When trees were not available, the surveyors were instructed to use earthen mounds and charred stakes.

The surveyors were required to provide, in addition to bearing tree data, landscape features including:

1. "the name, diameter, and distance on line to all trees which it [the line] intersects." [Note that in the two townships which were studied for this report, not all surveyors appeared to follow this instruction, and possibly only for the larger trees on the line.]

2. "Intersections of **land objects**. The distance at which the line first intersects and then leaves...prairie, river, creek, or other 'bottom,' or swamp, grove and wind fall,..."

3. "Intersections by line of **'water objects.'** All rivers, creeks...and their widths on line."

4. **"Timber** - the several kinds of timber and undergrowth."

5. **"Bottomlands** - to be described as wet or dry, and if subject to inundation, state to what depth."

This information, which is a subset of surveyors' instructions and techniques, was found to be the most valuable in the interpretation of the historical survey notes.

A contemporary surveyor cautioned that some of the surveyors did not always do as thorough a job when recording features along the east-west section lines, especially when noting streams or other variable features. Sometimes they might not even walk the second half of the line (Parsons, 1990). In another example, one of the Coquille area surveyors did not record the points at which tributaries entered the Coquille, including one of the more significant streams, the Beaver Slough. Therefore, the number of stream-miles and tributaries calculated in the report can be assumed to be a conservative estimate.

Historical Landscape
Map Reconstruction Methods

The Original Land Survey Notes, the documents that are products of the first Oregon land surveys, contain a wealth of descriptive information and data concerning the lower Coquille valley during the mid-1800s, prior to substantial development of the area. Microfiche copies of these hand-written survey notes for Northwest lands can be purchased from the Bureau of Land Management (BLM) in Portland, Oregon. Often, County offices have copies as well. These survey notes were used to produce historical maps for the valley along the tidal section of the river.

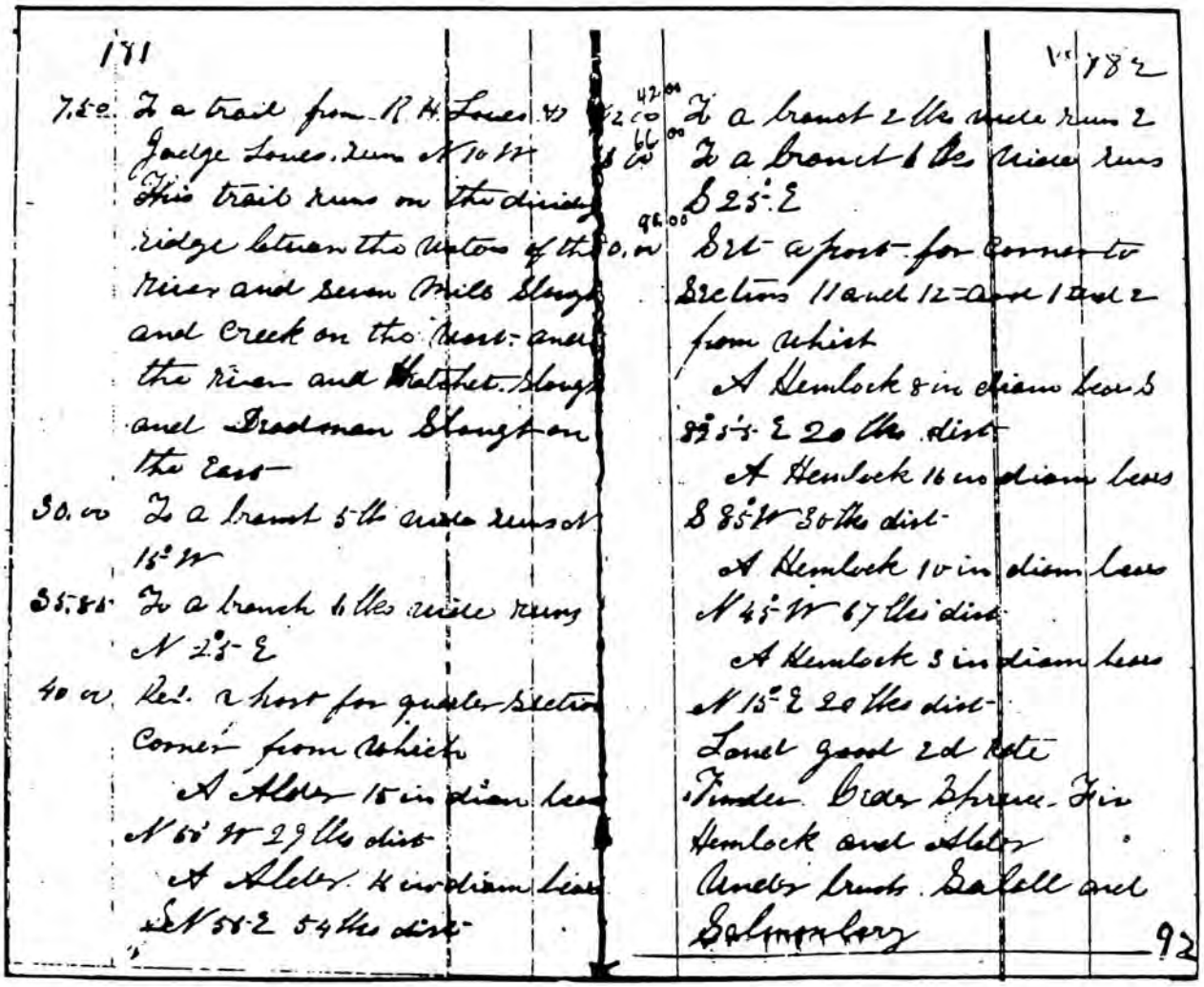
It is often difficult to read the Original Land Survey hand-written records produced by a number of different surveyors. Handwriting quality, which varied from fairly readable to poor, sometimes made notes difficult to follow until one became familiar with the surveying techniques and handwriting (Figure 3.2.1.2).

Since the research was to involve extensive and ongoing use of the survey notes, time was first spent transcribing the notes for three of the townships in a form which imitated the page and line layout of the original notes. It was later discovered that the Coos County Surveying office had transcribed notes as well, and although they included the survey post data, they lacked some of the other substance, and were not in the format of the original survey notes. The time taken to transcribe the notes of the key townships was well worth the effort considering the many different ways in which the notes were then used and repeatedly referred to for interpretation and information collection. Other township notes were also consulted for a small amount of data such as channel widths, and transcription was not necessary for that purpose.

The river bottomland and the gentle, rolling uplands were the first lands to be surveyed. The earlier surveys tended to be of the land that was viewed as the type fit for use by settlers. The mountainous hillsides and some of the wetter marshlands were often left for later surveys, and were originally passed by as "unfit for settlement." There were a few homesteads, cleared lands and trails in the Coquille Valley at the time that much of the surveying work was done, but for the most part the landscape retained the characteristics of the pre-Euro-American period.

Unfortunately not every surveyor was as dedicated to recording detailed information, and each surveyor varied somewhat in their dedication and focus. However, with few exceptions, the survey notes were accurate in their descriptions of the land.

For this work, current U.S.G.S. topographical maps were used to create a baseline map marking the Coquille River and the section line locations.



181

7.50 To a trail from R. H. Lowe to Judge Lowe. Runs N 10 W
This trail runs on the divide ridge between the waters of the River and Seven Mile Slough and Creek on the West and the River and Hatchet Slough and Deadman Slough on the East
30.00 To a branch 5 lks wide runs N 15° W
35.85 To a branch 6 lks wide runs N 2° E
40.00 Set a post for quarter Section Corner from which
A Alder 15 in diam bears N 65° W 29 lks dist
A Alder 4 in diam bears S 58° E 54 lks dist

182

42.00 To a branch 2 lks wide runs E
2.00 To a branch 6 lks wide runs
66.00 S 25° E
80.00 Set a post for Corner to Sections 11 and 12 and 1 and 2 from which
A Hemlock 8 in diam bears S 85° E 20 lks dist
A Hemlock 16 in diam bears S 85° W 30 lks dist
A Hemlock 10 in diam bears N 45° W 67 lks dist
A Hemlock 3 in diam bears N 15° E 20 lks dist
Land good 2d rate
Timber Cedar Spruce Fir Hemlock and Alder
Under brush Salal and Salmonberry

92

Figure 3.2.1.2. Example of a handwritten page from the Original Land Survey Notes for the Coquille River.

The historical vegetation maps showing forested and other wetland boundaries, and upland vegetational communities were created using extensive data collected from the Original Land Survey Notes. Since these data only described the landscape along section lines, the U.S.G.S. topographical maps were also used to establish boundary lines that connected one section line point to another.

The current day topographical maps also served as a "check method" to test the Survey Notes data to determine if the information was reasonable. The landscape descriptions in the Original Land Survey Field Notes generally conformed very well to the topographical changes recorded on current U.S.G.S. maps. These included the references to land form ascent or descent, ravines and ridges, and most importantly the historical descriptions of transition from "wet and miry" or "marshy bottom land" were confirmed as highly probable by the current topographical maps.

A contemporary surveyor commented that when section lines were surveyed, the general information concerning each section line, such as the point of the summit, or the edge of a forest, or stream intersection, were often committed to memory and not recorded in writing in the field notes until later in the day or evening (Parson, 1990). The survey measurements of such landscape features were usually given in round numbers such as 56.00 chains, rather than chains and links (56.89 ch.) as the bearing tree measurements were given.

Comments

At about river mile 28, the U.S.G.S. topographical maps began reporting slight rises of 1-10 feet in some areas of the bottomlands. The U.S.G.S. maps verified some of the historical survey reports of the upper tidal river where lowland was called **"bottomland"** but not referred to as marshy. Most of these areas were slightly higher in elevation and these slightly higher areas of ground began appearing on the topographical map at about river mile 28.

These areas apparently did not visually appear to the surveyors as being marsh-like at the time of the survey (but might have been flooded at times during the winter). It can be generally assumed that the surveyors only described lands as wetland (marshy, swamp, mucky, mire, surface water, etc.) when there were visible wetland characteristics during the season in which they surveyed. If a surveyor did not report a section of land as marshy, then it was not included as an area of wetted land in the reconstructed maps.

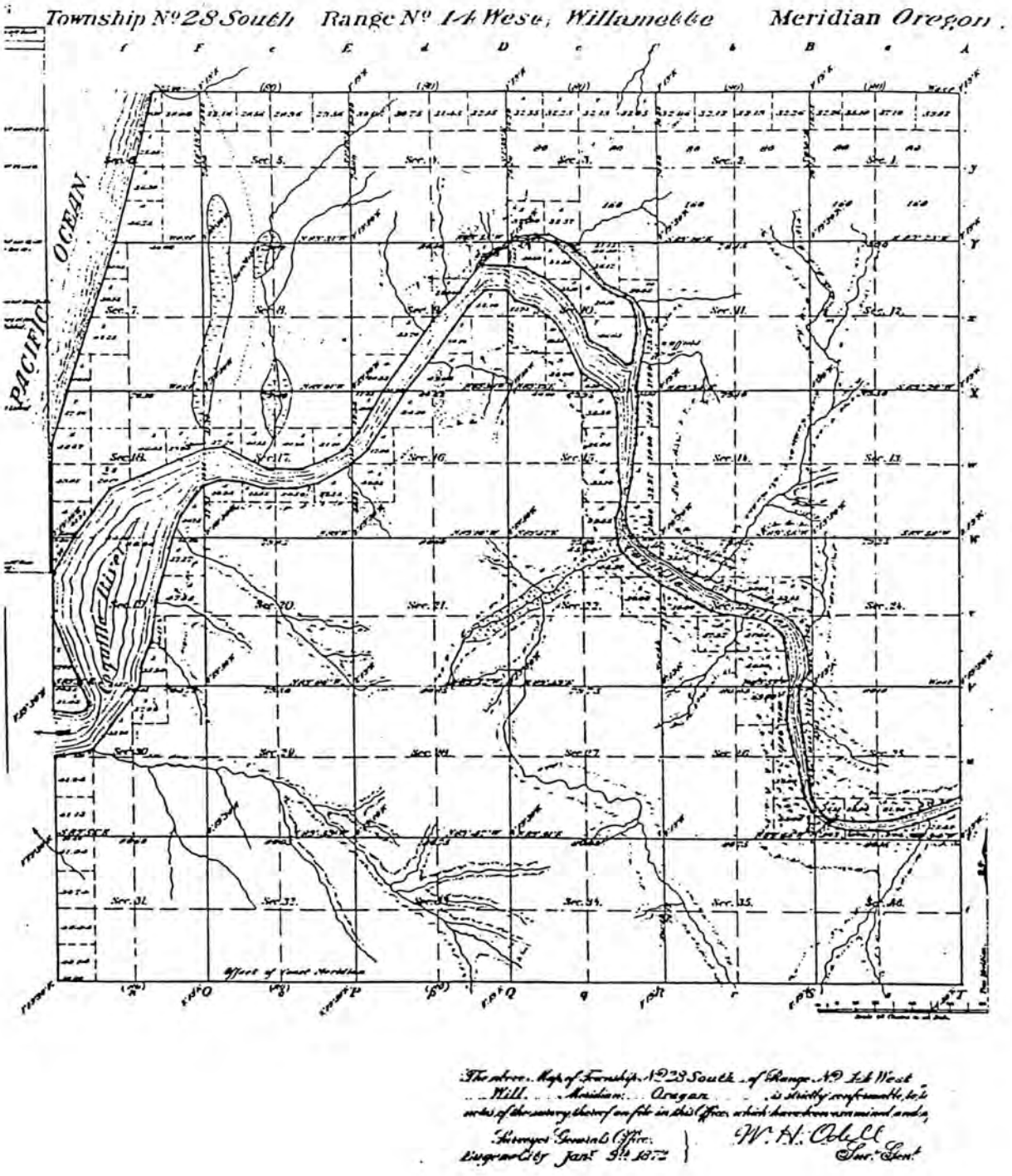
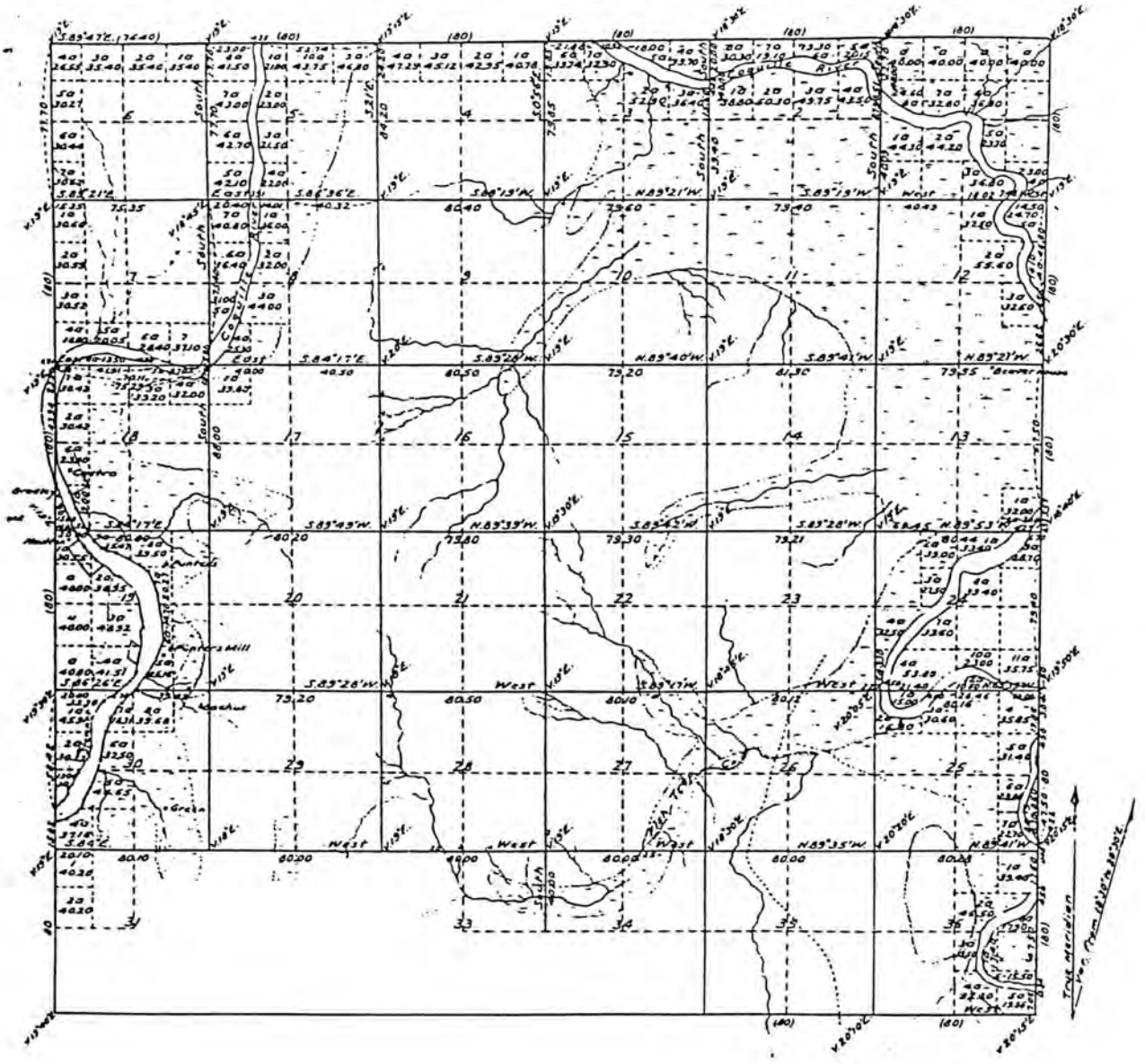


Figure 3.2.1.3. Original Land Survey Cadastral Map for Township 28 South, Range 14 West, drawn in 1872 after the township survey had been completed.

Township No. 28 South, Range No. 13 West. Willamette Meridian, Oregon.



The above Map of T28S, R13W, Will Mer. Oregon is strictly conformable to the original field notes of the survey thereof on file in this Office, which have been examined and approved
Surveyor General's Office.
Eugene City March 26th 1872
signed: Wm H Odell

Figure 3.2.1.4. Original Land Survey Cadastral Map for Township 28 South, Range 13 West, drawn in 1872 after the township survey had been completed.

The construction of historical maps such as the ones in this report should be expected to require a significant time commitment. Included in that time period is the assumption that one will produce a draft product, then set it aside for awhile and return to it to critically assess the interpretive work required to produce the map. The alternative, however, is accepting the cadastral maps that were produced at the time of the original survey. These maps, though generally interesting, are not always accurate, and do not provide landscape feature detail (Figures 3.2.1.3 and 3.2.1.4).

Additional Methods

The U.S. Army Corps of Engineers Annual Reports to Congress, published within the Congressional leather-bound Executive Documents, summarized the Army Corps' river operations. The reports were specific as to the amount of woody debris removed from the river channel, the amount of channel material dredged, and other activities associated with the use of allocated public funds. Periodic river survey results were also reported. After the U.S. Army Corps of Engineers retired from maintenance of the Coquille as a navigable waterway, the local Port of Coquille was formed. Luckly this agency kept thorough records, and these records had been saved and archived. River depth sounding data maps have also be located, and will be analyzed in the next phase of study.

The compilation of all of the annual dredging data and problem shoal (gravel bar) spots on the river as annually reported by the Corps, and listed in the weekly foreman's work reports to the Port, created a data set that from which a channel depth and possibly filling story was constructed.

Specific details regarding the sources and uses of archival materials for other report topics similar such as the splash dam material, upriver channel and bank clearing, and bottomland stream reconstruction, has been addressed within the text of those sections.

3.2.2 Historical Marshlands and Adjacent Upland Landscape

Introduction

Every winter extensive sections of the lower Coquille River valley are frequently flooded by rainfall, surface and subsurface runoff into the bottomlands from the uplands, or by higher river flows. As a child in the 1940s, Carol Wood visited her aunt, who lived in Arago. She recalled that during the winter, the community was sometimes virtually waterbound by the flooding river, and at those times the only practical way to leave or return to Arago was by boat. Apparently the road that hugged the south western hills was usually passable, but the route was a lengthy and impractical way to reach Coquille or Myrtle Point (Personal conversation, 1990).

Current aerial photographs taken of the valley show that today all but a few areas of this land to the south and east of Arago are part of the agricultural network of the valley. One hundred and fifty years ago the landscape was different. In September of 1858, when Surveyor Truax walked across these Coquille bottomlands just to the south of the current day Arago, he described what he had surveyed.

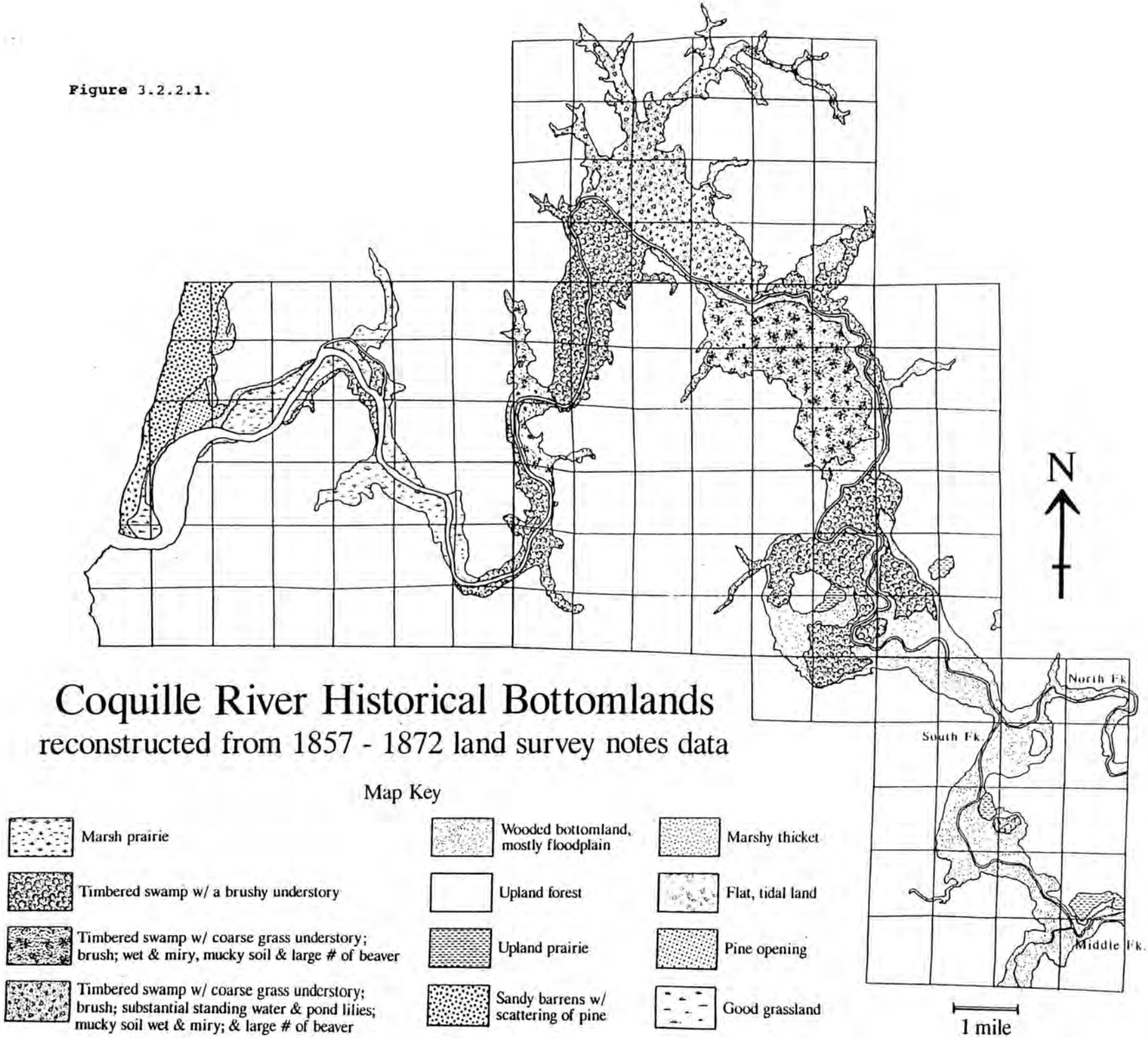
> **"Surface level, mostly swamp; water from 6 to 24 inches deep. Soil first rate. Timber [in swamp] Ash, Alder, Willow, Maple & Myrtle. Undergrowth Crab-Apple, Salmon[berry], Vine Maple and Willow."**

This section of the report is a compilation of archival material that reconstructs some of the historical features of the tidal Coquille River bottomlands in the mid-1800s, at the time of Euro-American settlement of the valley. These features include the historical locations and acreage of wet bottomlands, the associated types of vegetational communities, and other features of these lands as well as some of the bottomland tributaries at that time.

The Coquille River Bottomland Historical Landscape

At the time of Euro-American settlement in the mid-1800s, 70% or 14,440 acres of the Coquille bottomlands along the tidal portion of the channel were swampy or marshy in nature (Figure 3.2.2.1). The majority of the remaining bottomland was in floodplain.

Figure 3.2.2.1.



Coquille River Historical Bottomlands

reconstructed from 1857 - 1872 land survey notes data

Documentation of these features of mid-1800s Coquille River bottomlands along the tidal portion of the river was assembled for this report primarily from the 1800's Original Land Survey Notes. The first surveyors noted vegetation and other landscape characteristics along township section lines and at survey corners, and recorded landscape transition points between vegetational communities and other general landscape features. (See Methods section: 3.2.1: Historical Research.)

The 1800s tidal Coquille Valley bottomlands can be divided into five general descriptions based on soil appearance, vegetation and hydrological conditions, as characterized by the original surveyors. These were: the "marsh prairie;" a timbered swamp with a primarily brushy understory; a timbered marsh with some brush-sized tree species, a grass understory and especially "mucky" soils; a timber, brush and grass community with standing water confirmed by the presence of pond lilies; and the drier-appearing bottomlands, most of which were floodplain. These areas are mapped by township in Figures 3.2.2.2 through 6, and listed by acre in Tables 3.3.3.2a and 2b.

Table 3.2.2.1. Coquille Tidal Area Bottomland Composition Acreage by Township.

	T28S R14W	T28S R13W	T27SR13W
Marsh bottomland	2,507 acres	6,231 acres	4,766 acres
Non-marshy bottom	157 acres	1,314 acres	415 acres
Total bottomland	2,664 acres	7,545 acres	5,181 acres
River miles	10.8 miles	15.7 miles	4.5 miles
Percent Marshland	**94%**	**82%**	**92%**

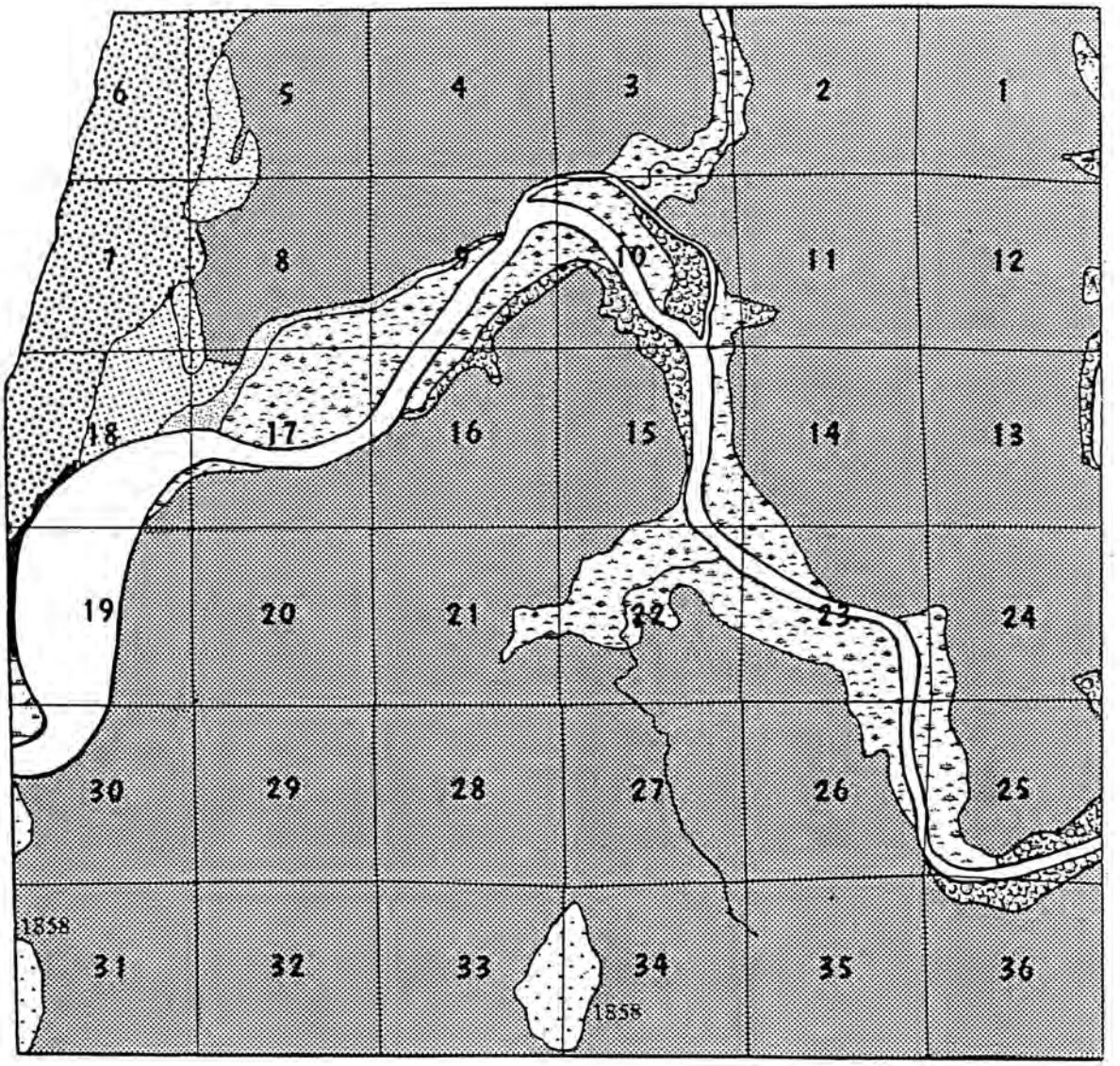
	T28S R12W	T29S R13W	T29S R12W
Marsh bottomland	655 acres	207 acres	75 acres
Non-marshy bottom	1,003 acres	136 acres	3,217 acres
Total bottomland	1,685 acres	343 acres	3,292 acres
River miles	3.5 miles	0 miles	12 miles
Percent Marshland	**40%**	**60%**	**3%**

1800's General Vegetation Map

Coquille River Bottomlands & Surrounding Uplands

Reconstructed using the 1857-1871 Original Land Survey Notes

Township 28 South Range 14 West



Map Key

1 section = 1 square mile

"Marsh prairie"

Timbered & brushy swamp

Marshy thicket

"Good grassland"

Upland forest land

Burnt opening

Sandy barrens scattering of Pines

"Timbered Swamp with coarse grass understory"

Wooded bottomland mostly floodplain

Pine Opening

Flat tidal lands

N

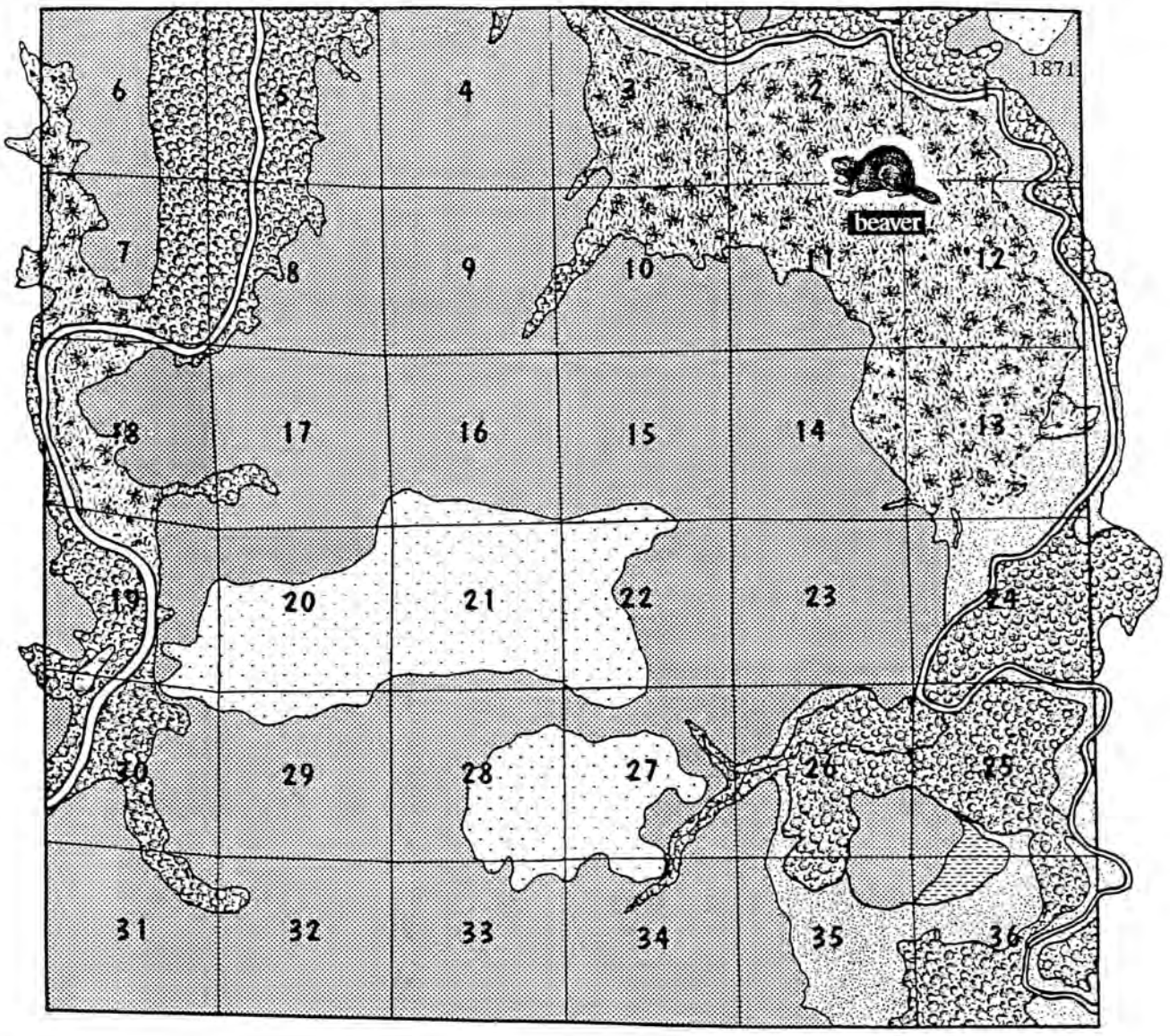
Figure 3.2.2.2.

1800's General Vegetation Map

Coquille River Bottomlands & Surrounding Uplands

Reconstructed using the 1857-1871 Original Land Survey Notes

Township 28 South Range 13 West



Map Key

1 section = 1 square mile

- "Grass marsh"
- Timbered & brushy swamp
- "Timbered swamp with coarse grass understory"
- Upland forest land
- Wooded bottomland mostly floodplain
- Burnt opening
- "Prairie"
- Timber, brush & grass swamp with surface water & pond lilies

N

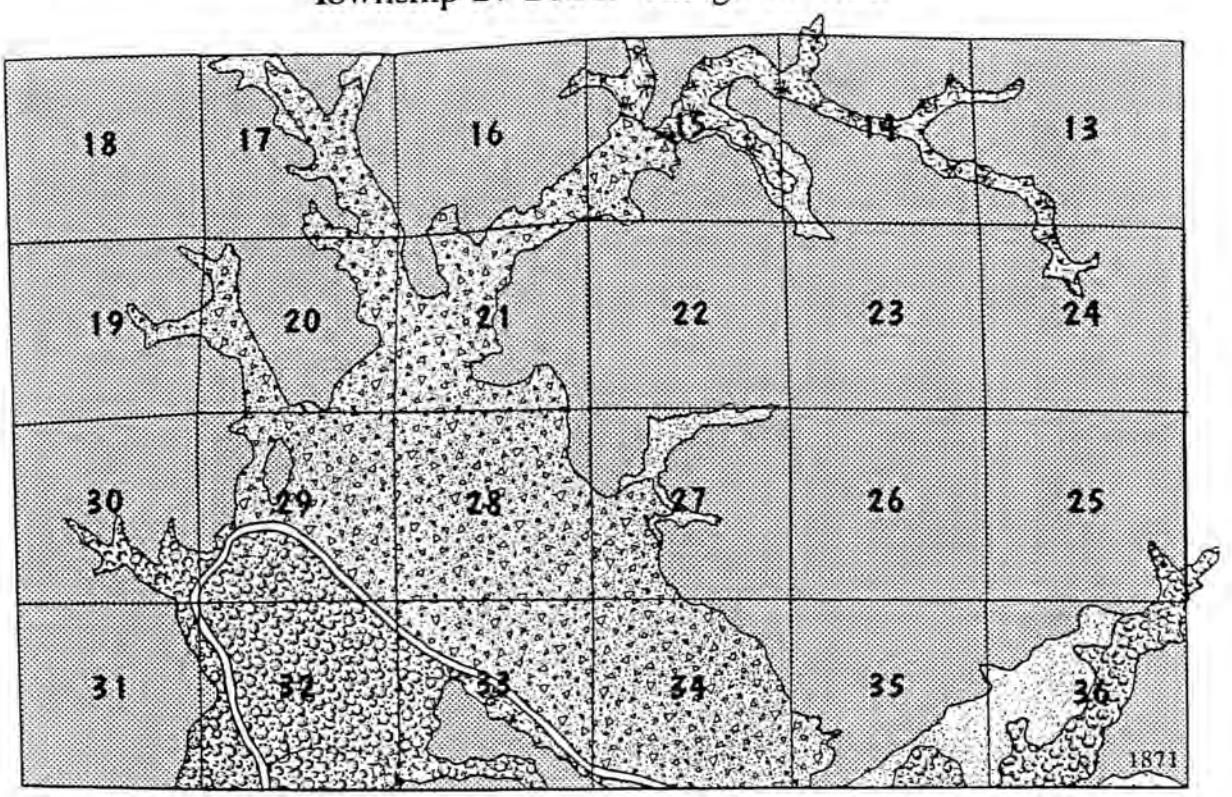
Figure 3.2.2.3.

1800's General Vegetation Map

Coquille River Bottomlands & Surrounding Landscape

Reconstructed using the 1858-1872 Original Land Survey Notes

Township 27 South Range 13 West



1 section = 1 square mile

Map Key

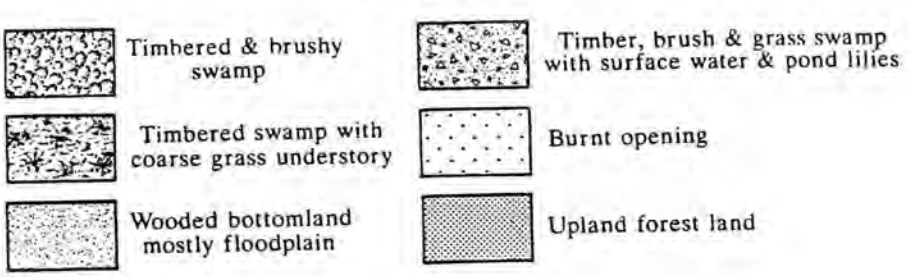


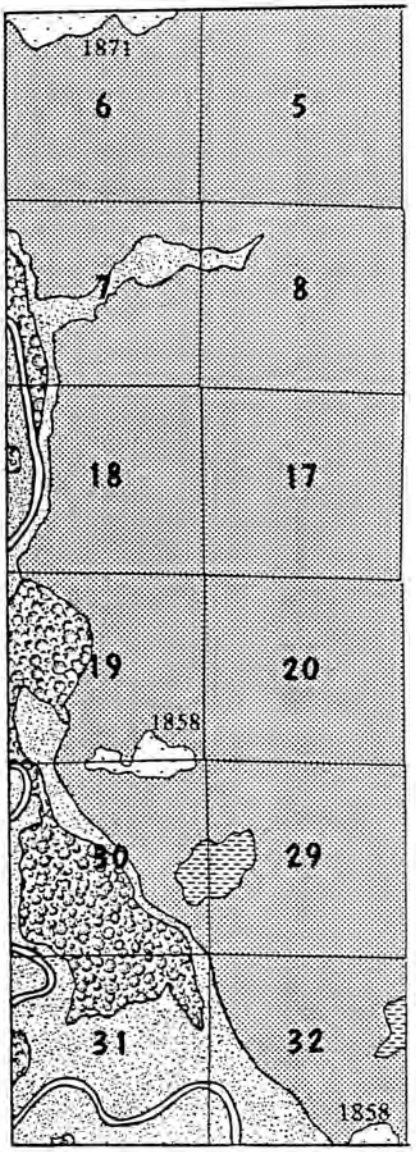
Figure 3.2.2.4.

1800's General Vegetation Map

Reconstructed using the 1857-1871 Original Land Survey Notes

Coquille River Bottomlands & Surrounding Landscape

Township 28 South Range 12 West



1 section = 1 square mile

Map Key

- Timbered & brushy swamp
- Wooded bottomland mostly floodplain
- Prairie
- Burnt opening
- Upland forest land

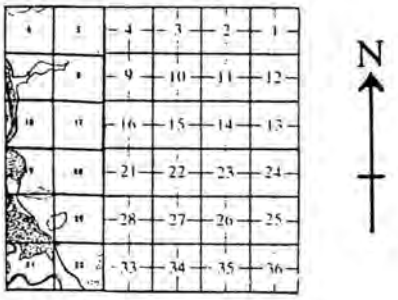


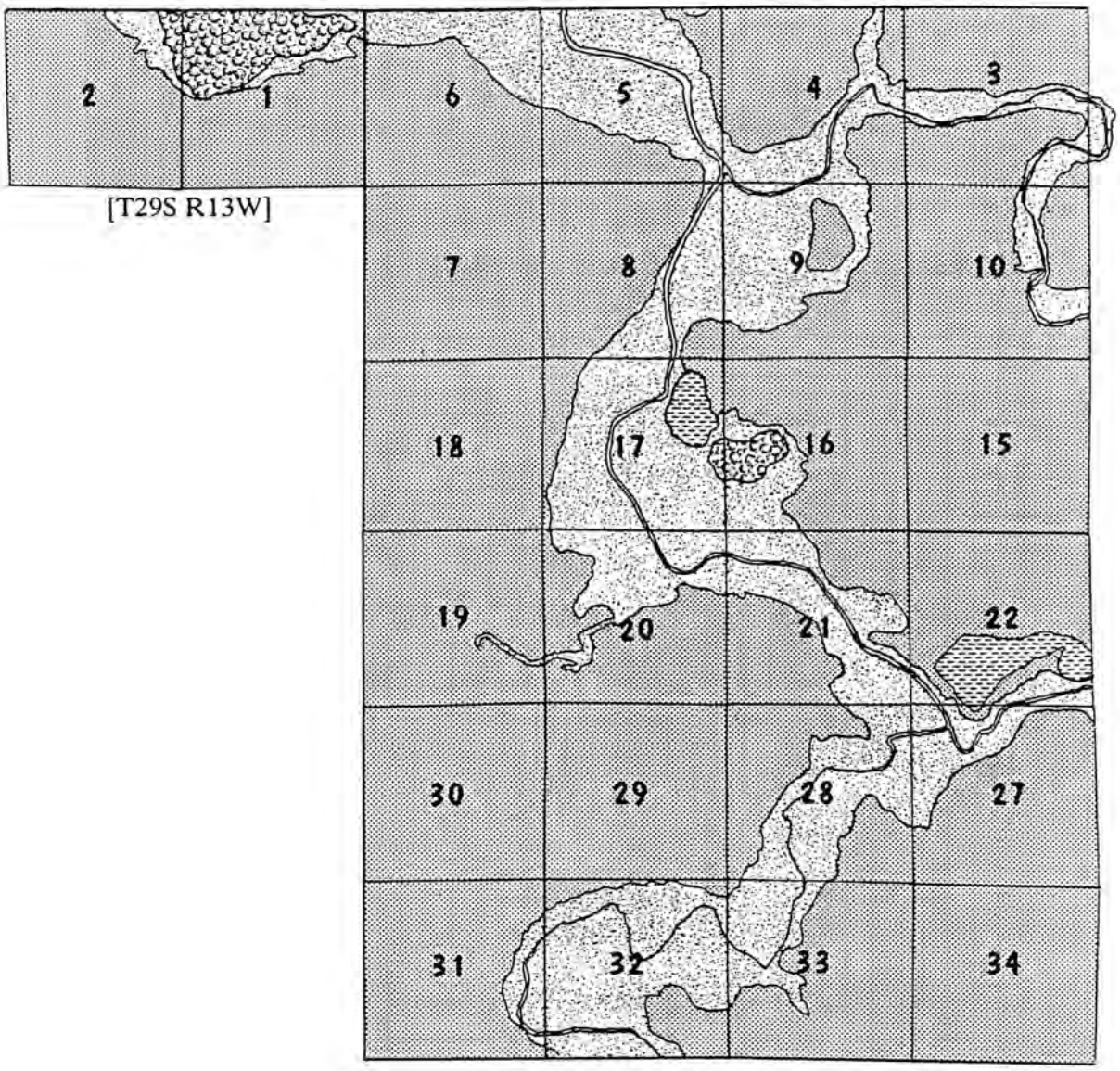
Figure 3.2.2.5.

1800's General Vegetation Map

Coquille River Bottomlands & Surrounding Landscape

Reconstructed using the 1858 -1872 Original Land Survey Notes

Township 29 South Range 12 West



1 section = 1 square mile

Map Key

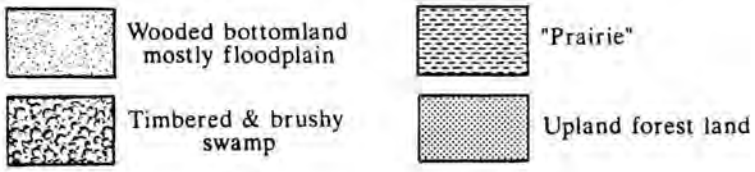


Figure 3.2.2.6.

Table 3.2.2.2(a).

1800's General Vegetation Map
Land Features Estimated Acreage
based on visual observations of 1800's surveyors. **
Reconstructed using the 1857-1872 Original Land Survey Notes

Feature	T28S R13W	T28S R14W	T27S R13W
Total marshland:	**6,231 acres**	**2,507 acres**	**4,766 acres**
Marshy grass prairie	19 acres	1,920 acres	--
Timbered swamp w/ brushy understory	3,287 acres	412 acres	1,267 acres
Timbered swamp w/ grass understory	2,925 acres	@ 12 acres	364 acres
Timber, brush & grass, pond lilies & water	--	--	3,135 acres
Marshy thicket	--	175 acres	--
Non-Marshy Bottomland:	**1,247 acres**	**124 acres**	**414 acres**
Other Areas:			
Flat, tidal lands	--	33 acres	--
Burnt uplands	1,919 acres	282 acres	27 acres
Scattering of pine	--	1,141 acres	--
Pine opening	--	225 acres	--
Prairie	77	--	--
Coquille River	450 acres	1,180 acres	118 acres

Approximate Acres in a Township: 23,040 acres

** These values were estimated based on maps reconstructed from Original Survey Notes descriptions and U.S.G.S. topographic maps to aid in the formation of bottomland boundaries between section lines, and soil survey information.

Table 3.2.2.2(b).

1800's General Vegetation Map
Land Features Estimated Acreage
based on visual observations of 1800's surveyors.
Reconstructed using the 1857-1872 Original Land Survey Notes

Feature	T28S R12W	T29S R13W	T29S R12W
Total marshland:	**655 acres**	**207 acres**	**75 acres**
Marshy grass prairie	--	--	--
Timbered swamp w/ brushy understory	655 acres	207 acres	75 acres
Timbered swamp w/ grass understory	--	--	--
Timber, brush & grass, pond lilies & water	--	--	--
Non-marshy Bottomland:	**1,003 acres**	**136 acres**	**3,217 acres**
Other Areas (within the sections of townships mapped):			
Flat, tidal lands	--	--	--
Burnt uplands	116 acres	--	--
Scattering of pine	--	--	--
Pine opening	--	--	--
Prairie	99 acres	--	199 acres
Coquille River (including the historic tidal portions of the North & South Forks.)	86 acres	--	222 acres

Approximate number of acres in a township: 23,040 acres

The estimates of the historical wet bottomland acreage in this report only included areas that were reported by the surveyors to be visibly "wet and miry," or "covered with water three-quarters of the year," and swampy at the time that they walked the section lines and noted the features of the land. Often the surveyors walked the land during the summer and early fall months; a portion of the survey work was done in the winter or spring. A number of times the surveyors commented that the lands were so marshy that it was impossible to survey them during most of the year. Even in September they had to offset the line around impassible marshy lands.

If the bottomlands were not described as "marshy" or otherwise wet, then the areas on the maps are referred to as only "bottomland." The majority of these lands were within the 100-year floodplain. (A "100-year floodplain" ranges from areas that can be flooded one or more times a year, to higher ground that has the probability of being inundated once every one-hundred years.)

The bottomlands in this inventory included lower bottomlands connected with major tributaries to the Coquille that were immediately adjacent to the main valley floor.

Examples of survey tree data that aided in the substantiation of the surveyors' comments are summarized in maps for Township 28 South Range 14 West located at the end of this section (Figures 3.2.2.10, 11 and 12). These data were helpful when examining the surveyors' reports of "wooded" marshlands to determine if the lands were truly forested with tree-sized vegetation.

Current-Day Bottomland Description

The 1979 Oregon Department of Fisheries and Wildlife Estuary Inventory Report titled Natural Resources of the Coquille Estuary (the "Racoon Report") summarized the Coquille River bottomlands as they exist today:

> **"The conversion of marsh to farmland in the Coquille valley covers the entire length of the riverine subsystem."**

Diking, the ditching of drainage channels, and the tiling of some of fields have all facilitated the creation of farmland from marshland in the valley. In some pasture areas, however, plant species persist and soil moisture retain the characteristics that are more typical of marshland. In some cases the dikes may actually trap water in the fields.

Influence and Role of Historical Marshlands

The influences that the features of these historical marshlands had on the landscape and its resources were broad in scope. The marshlands functioned as a source and regulator of nutrients, including nutrient augmentation to the tidal portion of the river. The trees would have been the source of organic leaf and wood input to the Coquille system. The trees and brush would have also created a hydrological framework for sediment trapment and deposition on the floodplain during higher winter flows.

Standing vegetation would have also trapped woody debris in the floodplain as it was transported downriver during floods. The complex habitat structure involving downed wood and tree cover in a forested marshland would have provided refuge for fish from the main channel flood waters during storm events, and would have enhanced bottomland tidal creek habitat with cover, wood, and leaf and insect inputs of food to the streams. It is quite likely that the historical conditions of the lower river's associated bottomlands provided optimal juvenile coho salmon habitat. The agricultural lands to some degree contribute these same functions, but to a lesser degree and because of the present drainage systems, during fewer months of the year (See Bottomland Stream Section 3.2.3).

Though some bank failure and erosion is inevitable along an interface of alluvial valley lands and a flowing channel, especially at river bends, tree and brush plant communities that began at the river bank and extended across the bottomland provided several lines of defense against bank erosion, including the dissipation of flood water energy. The broad bottomland floodplain upriver would have slowed and temporarily stored flood waters to reduce the impacts of flooding downriver. Meandering tidal creeks and overland movement of water through the marshlands provided opportunity for the marshland to filter biological processing of materials.

Marsh Prairie Discussion

The bottomlands that were described as grass wetlands were located almost exclusively along the lower portion of the Coquille River. All but a few acres of grass marshland were found downriver of River Mile 11 (three miles upriver of current day Parkersburg). Approximately 1,920 acres of "marsh prairie" were located in this lower river area. An isolated additional 19-acre patch of grass marsh was reported a little farther upriver.

The surveyors used phrases to describe these marsh areas such as **"Marsh Prairie," "grass marsh" or "low prairie subject to overflow."** The scarcity of trees available as survey markers documented the lack of woody vegetation. Often a surveyor had to measure over 300 feet to find a tree to use for a survey bearing tree, or resort to substituting a trench to mark a survey corner.

Examples of surveyors' bottomland descriptions in these marshy areas included notes by Surveyor James Aiken. In January of 1871 he described the boundary of sections 23 & 26 in T28S R14W as a **"marsh prairie."** He noted, **"bottom good, swampy & wet - when properly drained 1st rate."** The land along the section line was **"subject to overflow."**

In August the bottomlands between sections 9 and 10 in T28S R14W were also described as, **"low bottom mostly prairie subject to overflowing high tides and River freshets"** (Murphy, 1857).

The corner of sections 16, 17, 8 and 9 in T28S R14W was near the center of what was described by Surveyor Murphy in August, 1857 as **"Land is low Prairie subject to overflow." "A charred stake and raised mound with a trench"** was used to mark this section corner and the right bank meander post, indicating that this area of prairie was devoid of trees. The bottomlands adjacent to this corner were described as a **"low, marshy prairie."**

A river meander post along the section line between sections 9 and 16 in T28S R14W, was in another area described as **"prairie"** in a **"marshy bottom,"** and was marked with one bearing tree and a charred post. Trees were apparently limited in availability. The single bearing tree, an ash 9 inches in diameter, was 65 feet from the post.

The corner post 23-24-25-26 in T28S R14W was in a **"tide Marsh"** which apparently contained very few trees, as the surveyors selected three bearing trees that were 109 feet, 157 feet and 255 feet away from the corner post. A fourth tree was not available in the northeast quarter. In addition, land just to the east was described in December as **"marsh prairie"** (Aiken, 1870).

The **"Marsh Prairie"** bottomlands between sections 14 & 15 and 10 & 15 in T28S R14W were described by Aiken as having potential for homesteading. **"Bottom good rich soil Marshy, wet, when drained 1st rate"** (Aiken, 1871).

In his "General Description" of the western half of Township 28 South, Range 14 West in August, Surveyor Murphy described these lands.

> **"The prairie bottoms on the Coquille River are covered with a heavy coat of fine grass but they are low and Marshy and subject to overflow by the River freshets as well as the high tides..."** (Murphy, 1857).

The historical descriptions document what could have been hypothesized, that the tidally influenced bottomlands near the ocean river mouth would have characteristics of an open marsh. The transition lands along the marsh edges abutting higher ground grew timber such as spruce and ash, but in the marshes trees were scarce.

Timbered Swamp with Brushy Understory Discussion

Timbered marshland was the most common form of wet bottomland in the Coquille River townships. Of the 14,440 acres of marshy bottomland, 5,832 acres were timbered with trees and an associated understory predominantly composed of a variety of brush and briers. Tree species that either preferred or would tolerate wet or seasonally flooded bottomland soils grew on these bottomlands. The surveyors used such phrases as **"land swampy, the swamp is timbered,"** to describe these bottomlands. The reasonable proximity of trees available for surveying purposes documented significantly-sized woody vegetation distributed throughout these swampy areas that ranged in typical size from 3 to 12 inches in diameter.

Matthew Murphy and his crew were the first surveyors to document these expanses of timbered and brushy marsh areas of the tidal Coquille Valley. In May of 1857 he described a typical section of bottomland along the boundary between Townships 28 South, Ranges 13 and 14 West which he described as a **"Marsh."**

> **"Land mostly river bottom low and marshy...Timber Myrtle, Alder & Maple [with an] undergrowth of salmon berry, Willow & Crab Apple."**

And,

> **"Timber in Marsh Maple, Alder, and Ash"** (Murphy, 1857).

A typical corner post, between sections 7 & 18, to the south of the river by 155 feet, and about 660 feet from the edge of the marsh to the north. The bearing trees for this corner post in this marshy bottomland area and the meander posts for the Coquille River were as follows:

Trees	Diameters (inches)	Distance to trees from survey post
Alder	8, 5, 5	20, 5 and 16 feet
Willow	7, 6	21 and 23 feet
Ash	12, 10	53 and 33 feet
Maple	9	11 feet

The sizes and the distances of these bearing trees from the surveying posts suggest a timbered landscape in this bottomland. Bearing tree data for typical upland forested areas documented similar distances to hemlock, fir, cedar or other forest trees.

Though the section on Historical Survey Techniques describes this in more detail, it is worth noting that the surveyors in the 1800's preferred bearing trees of the size between 6 to 12 inches in diameter, if available within a reasonable distance from a survey post. It can't be assumed that these bearing trees were

necessarily representative of the largest or the smallest of their species in a marsh area.

Some areas of forested swamp were quite wet and covered with water, even in September. Sections of forested land along the north boundary of T28S R13W described by Murphy, in September were **"covered with water and impassible."** The west two-thirds of the south boundary of section 36 in T28S R13W, south of the current day location of Arago, was described as a **"swamp."** As mentioned in the introduction, in September, 1858 Truax described the land along this section line as **"Surface level, mostly swamp water from 6 inches to 24 inches deep"** (Truax, 1858).

The northern boundary of section 3 in T28S R13W, just west of the current day Coquille City, described by Murphy on September 7, 1857, also appeared to be covered with large amounts of surface water. **"Land except west 7.00 chains low Marshy bottom subject to overflow. It is covered with water for 3/4 of the year. Timber Ash, and Maple and immediately in the bank of the River Some Myrtle. A dense undergrowth [the section line] of Willow, Crab Apple & Salmonberry"** (Murphy, 1857).

The bearing trees in this marshy bottom at the north-eastern corner of section 3 in T28S R13W were as follows:

Ash	9	inches in diameter
Ash	14	inches in diameter
Alder	4	inches in diameter
Willow	10	inches in diameter

The segment of **"marsh"** along the east boundary of section 36 across the river from Arago in T28S R13W, was vegetated by, **"Timber Maple, Myrtle, Ash, Alder, Willow, and Crab apple. Und. Gwth. Salmon[berry], Crab apple, Gooseberry, Willow & briers"** (Truax, 1858).

Most of the section line on the east boundary of section 24 to the east of the Coquille River (near the current day log holding pond near the Johnson Mill) in T28S R13W was wet during July - **"enter swamp east & west."** The quarter section corner trees located in this swamp were two willows, 12 and 8 inches in diameter, one willow 11 feet and the second 8 feet from the post. The vegetation description at the end of the section was, **"Timber Maple, Myrtle, Alder, Crab Apple & Willow. Under. Grth. Crab apple & Salmon[berry]** (Truax, 1858).

Between sections 10 & 15 south of Randolph Island, the surveyors traveled through a **"Spruce Swamp"** in January. The two quarter section post bearing trees at the edge of this swamp measured 10 inches and 3 feet in diameter (Aiken, 1871).

Timbered Marshes with Grass Understory Discussion

Timbered marshlands with tall coarse grass as the primary understory vegetation made up approximately 6,494 acres of Coquille bottomlands. These marshy areas were described as either having very **"mucky soil"** but with **"no [standing] water on surface except in beaver ditches,"** or as containing significant areas of standing water and associated **"pond lilies."** The former marshlands were primarily located in Township 28 South, Range 13 West across the river from Coquille City, the latter in the general area of Beaver Slough in Township 27 South Range 13 West. Both were heavily populated by beaver.

In general these lands on both sides of the river appeared to have been **"...all Swamp, level, High grass, Willow & Crabapple. Mucky, Wet & Miry..."** (Flint & Williams, 1871). The surveyors, as they passed through these areas in October, used descriptive phrases such as **"wet and miry [soil] with a thick growth of coarse grass,"** or **"understory grass marsh,"** along with documentation of timber and brush. The proximity of trees available for surveying purposes documented that there was tree-sized woody vegetation distributed throughout these swampy areas in various degrees of density. In some locations, especially ones with beaver activity, larger trees were scattered more sparsely throughout the swamp and were mixed with "small growth" or "thick brush" of "willow & crabapple."

Surveyor Murphy, in May of 1857, also noted a **"grass marsh"** in a large pocket of bottomland along the west boundary of section 7 in T28S R13W, but included a list of timber in his summary description of **"Timber in marsh, Maple, Alder and Ash."** Just north, along the west boundary of section 6 in T28S R13W, Surveyor Murphy traveled from the **"foot of hill"** and walked for about 660 feet through an **"understory grass marsh."** Two alders in the marsh were used as quarter section post bearing trees. These alders were 10 and 12 inches in diameter, fairly substantial in size. They were also only 3 and 13 feet away from the post.

The twenty-seven trees used as survey markers in the marsh south of Coquille City were almost exclusively willow trees, from 3 inches to 10 inches in diameter. Three were 3, 4 and 6 inches in diameter crab apples. The survey tree diameters in the Beaver Slough area marsh typically ranged in size from 4 to 10 inch willow, alder, crab apple and ash.

In October Surveyor Flint noted,

> **"Land level, all swamp, soft and mucky...with Willow and Crab Apple & now and then an Ash of stunted growth. Cut up with Beaver ditches. In many places water and mud.. Soil lose and shaky mud...high coarse grass & pond lilies.."**

Beaver & Grass Understory Discussion

The mention of beaver presence in the wide bottomlands across the river from the present day Coquille (Figure 7), included by Surveyors Flint and Williams, in October of 1871. **"Alder 8 inches in diameter growing up through the center of a large beaver dam."**

Most of the sections that were surveyed in this bottomland had one or more beaver descriptions. One willow bearing tree between sections 13 & 14 was **"gnawed by beaver."** Just south of the line between sections 12 & 13 was a **"Beaver house."** Along the mile of line between sections 12 & 13 in T28S R13W, **"Land all swamp - level - Willow, Crabapple timber. with a scattering Alder...Soil black muck - Would be valuable if drained or reclaimed. High coarse grass - Beaver houses are frequent through the swamp"** (Flint, 1871).

The land along the line between sections 11 & 12 in T28S R13W was described as **"land level - All Swamp - Willow - Crabapple and Swamp [?]. Heavy Coarse grass. Muck - no water on surface except in Beaver ditches"** (Flint, 1871).

The southern half of the line between sections 1 & 2 in T28S R13W was described in October as **"Land all swamp. Crabapple, Willow - Coarse grass & Mucky - Beaver & Elk."** (Flint, 1871)

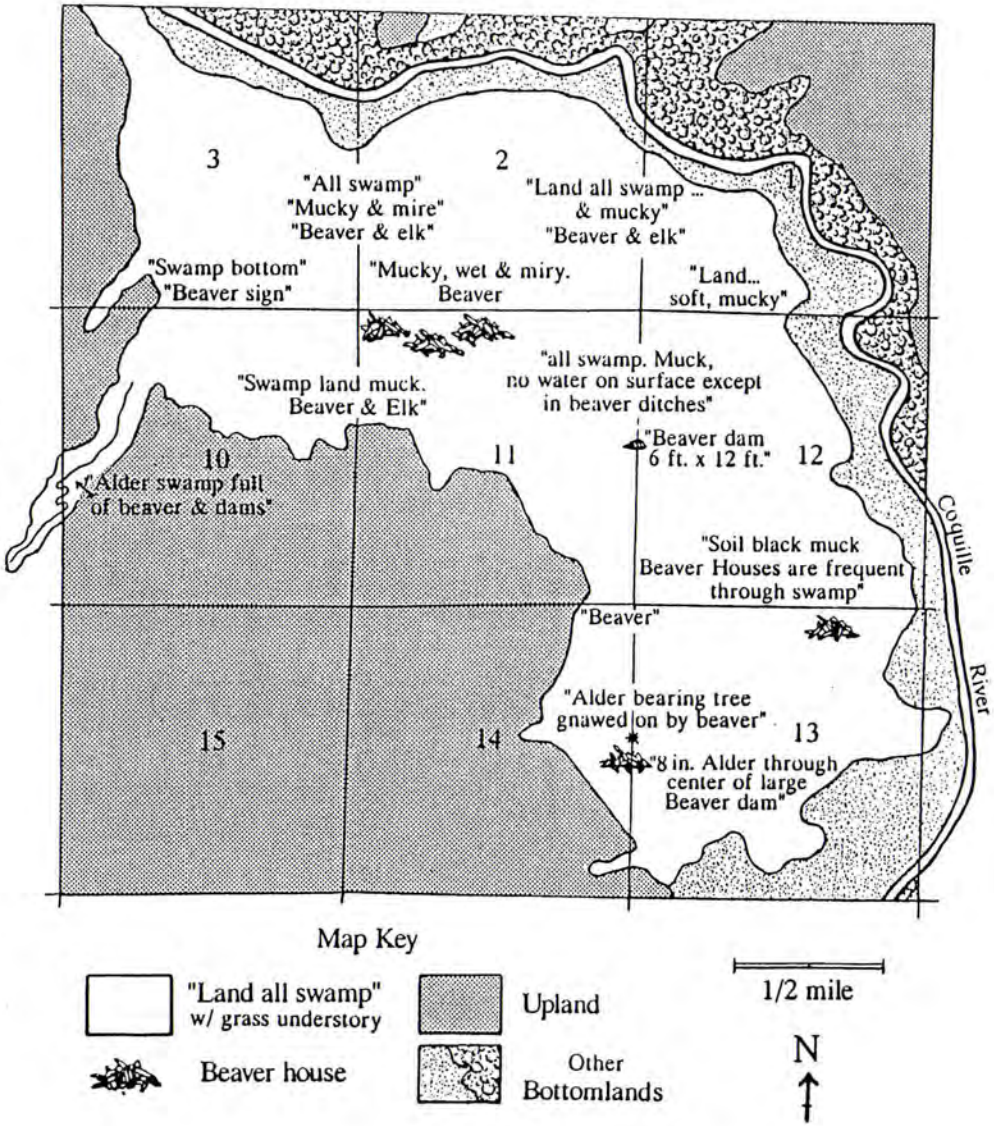
From these historical descriptions it appears that the beaver were attracted to this wide section of river bottomland, and they influenced the vegetation and hydrology of this area. Today this land has been developed into farmland (Figure 3.2.2.8).

Beaver were also extremely numerous in the extensive area of timber, grass and brush marsh north of the river in the general area of the Beaver Slough. Surveyor Flint repeatedly made comments in October of 1871 such as, **"a vast number of beaver dams and ponds,"** and **"much beaver & elk,"** or **"swamp and beaver."** The beaver population extended up into the marshy tributary lands as well: **"a swamp creek bottom made swampy by beaver dams"** (Flint, 1871).

Coquille River Bottomland Timbered Swamp

with Willow, Crab Apple & Alder Trees & Coarse Grass
October, 1871

Reconstructed using the Original Land Survey Notes
Township 28 South Range 13 West



"The Swamp is thickly timbered

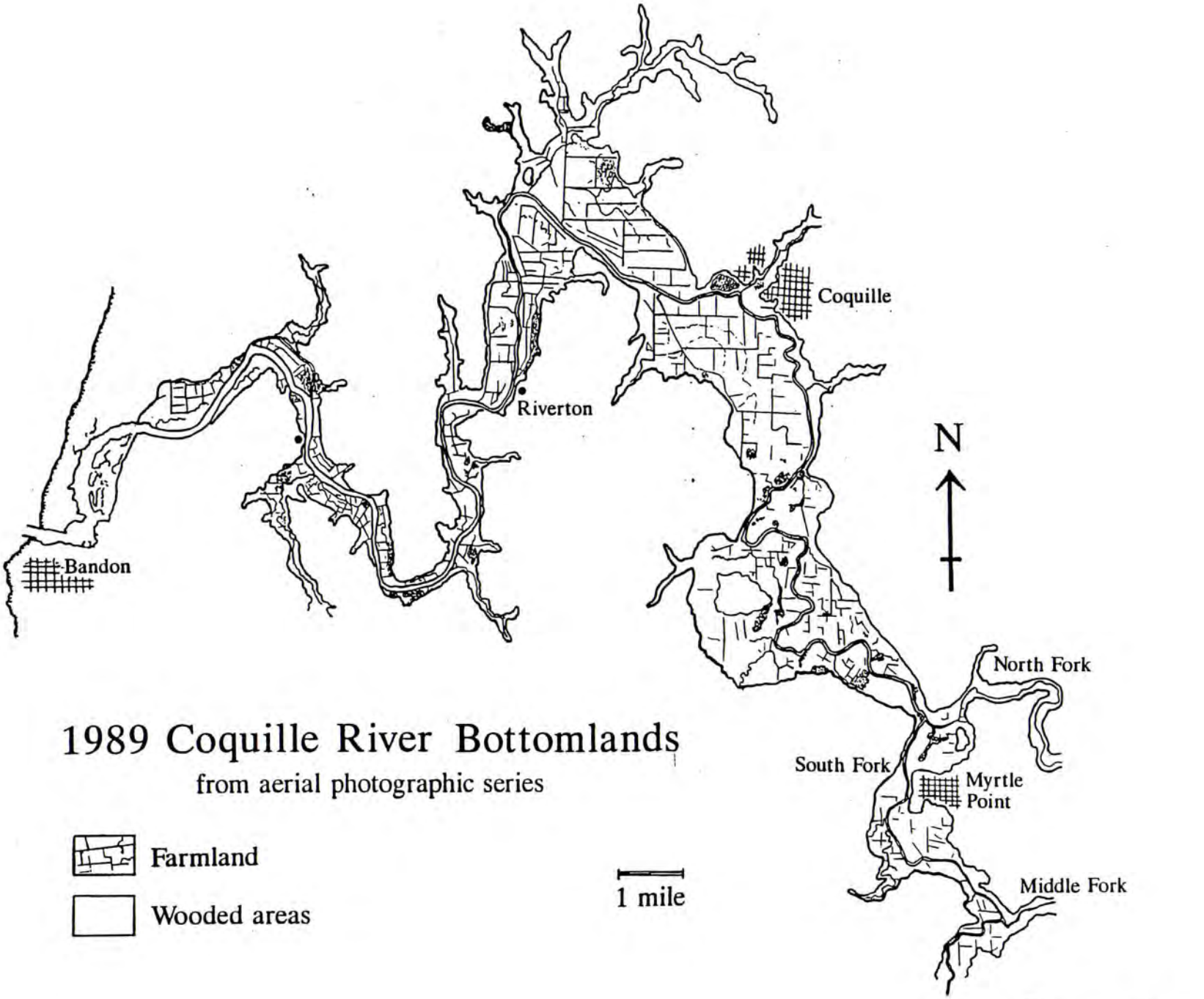
with Willow, Crabapple and a Mixture of Alder and Ash, and has a dense growth of Coarse grass - Beaver are abundant, and a few other animals are occasionally seen, such as Muskrats, Wildcats, coon, Mink & c..

Late in the summer & during the fall months it is a favorite resort for Bear & Elk."

At any Considerable raise in the Coquille River the water runs through this swamp with great force."

Surveyors Flint & Williams,
October, 1871

Figure 3.2.2.7.



1989 Coquille River Bottomlands
from aerial photographic series

Benne, 1992

Coquille River Bottom Farmland

November, 1989

Drawn from aerial photographs
Township 28 South Range 13 West

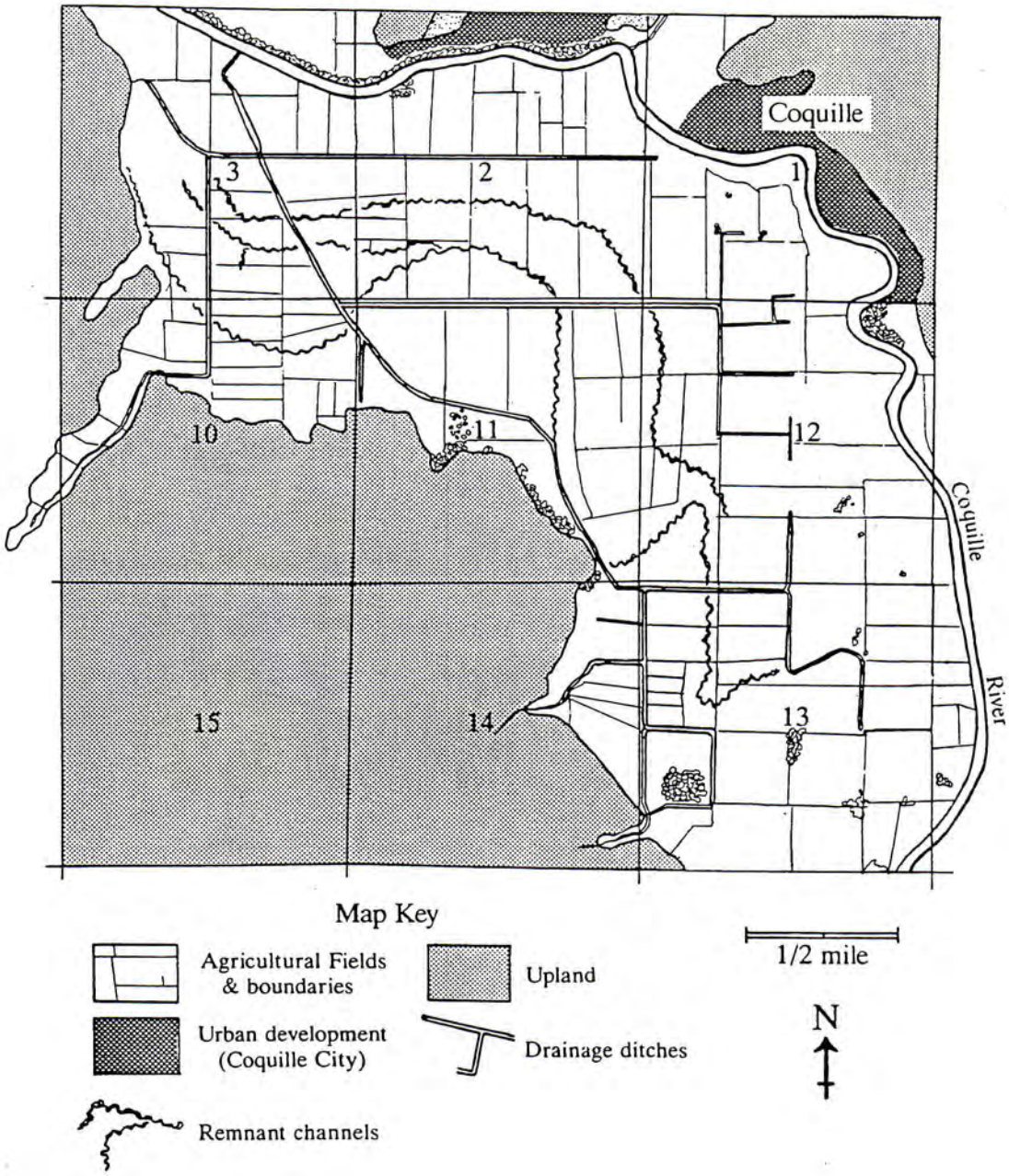


Figure 3.2.2.8. Farmland acreage in the same area as shown in the Figure 3.2.2.7 map of the 1871 landscape.

Timbered, Dry Bottomland Discussion

Approximately 1,371 acres of the bottomlands in the two townships were not described as "marshy," "wet," or other words implying standing water or high water table influenced landscape. Some of these areas may have been seasonally influenced by water, but at the time of the survey, these lands did not appear to have marshy characteristics to the surveyors.

One type of area of drier bottomland was the slightly higher land immediately adjacent to some sections of river bank. One instance in which a surveyor referred to a natural berm or dike, was between River Mile 14-15, a little downriver from Riverton. The left bank was described as being an approximately 10 yards wide strip of higher ground.

> **"Land swampy with a narrow sand ridge along the immediate River bank. Land ridge is brushy & with Maple & Myrtle timber. The swamp is timbered with Willow, Crabapple, Ash, Alder & c."** (Flint, 1871)

Just downriver, along the right bank at about River Mile 13, and the adjacent bottomland were described as, **"Land all swamp with a dry & narrow sand ridge next River. Where it has been cleared [bottomland] produces good crops of vegetables."** (Flint, 1871).

The reconstructed historical maps may not have included all of the narrow river bank natural berms if they had existed at that time. Only in a few instances did the survey notes make a mention of drier ground near the Coquille River.

Individual Areas

Randolph Island

Randolph Island was specifically mapped and described by the historical surveyors.

> **"This Island is principally a marsh or tide land low and wet. A narrow piece next to the river on the upper end and on the East and north shore is from 1 to 3 ft. higher than the main body of the Island with a verry thick growth of underbrush. Crabb Apple, vine maple and various kinds of brier vines...When properly dyked and drained first rate. Timber on the upper end of the Island Spruce, Alder, Ash"** (Aiken, 1871).

Bandon Marsh

Most of what is considered to be the Bandon Marsh today was surveyed to be a part of the active river channel in 1857. Today that area has aggraded to become vegetated marsh and tide flat. The northern-most portion of the current Bandon Marsh area was described as a **"Tide Prairie,"** and was about 183 feet wide, north to south. Considering the distance of the fir and willow bearing trees (267 and 360 feet respectively), it is very likely that there were no trees in the immediate area of the "tide prairie."

The left river bank meander post in the Bandon Marsh area was marked by two 6 inch spruces. One spruce was 179 feet, south, 62 degrees east from the post. The other was 217 feet away, at a bearing of north, 78 degrees east from the post. The meander post on the left bank in Bandon Marsh between sections 19 and 30 was also marked with 9 and 12 inch spruce bearing trees that were 40 and 565 feet away.

The lands [T28S R14W] immediately west of the Bandon Marsh area were **"low, flat Tidal land."** The surveyors used a charred stake and a spruce, 8 inches in diameter, to mark the right bank meander post on the far side of the river. They had to measure 874 feet, north-east thirteen degrees, to reach this spruce.

Creek Bottomlands

The larger creek bottomlands adjacent to and directly connected to the Coquille River bottomlands were also described by the surveyors. Most of these areas were timbered, some were dry bottomlands, and most were wet marshlands.

The tributary, Seven Mile Slough, was described to be 100 feet wide at its confluence, and 13 feet wide at the township line, traveled through a bottomland that was described as a **"grass marsh."** (T28S R14W) (Murphy, May, 1857.) Surveyor James Aiken, in April, 1871, also described the land associated with Seven Mile Slough as, **"a wet Marsh Prairie."**

The stream bottoms in T28S R14W were often described as marshy, and were often wooded with trees such as maple, myrtle, alder, ash and spruce.

> **"Some of these [creek] bottoms need much draining. They are mostly covered with a heavy thick growth of vinebrush such as brier buches and vines. Crabb Apple and vine maple.** And, **"The Timber on them is mostly Alder, Myrtle, and Maple and some Spruce"** (Aiken, 1871).

The bottomland of Lampa Creek in T28S R13W was described in October as,

> **"The swamps are timbered with Alder, Willow, Vine Maple, salmonbrier & c. The dry bottoms are timbered with Maple, Myrtle, & c. The Bottoms & swamp could be easily drained & made into valuable farming land. A portion of them are claimed"** (Flint, 1871).

The Alder Creek bottomlands were described by Flint & Williams, November 8, 1871, also as wooded swamp. **"The swamp is timbered with Alder, and salmonbrier bush."**

The timber in the upland creek bottoms between sections 33 & 34 in T28S R13W: **"Timber in creek bottoms Maple & Myrtle"** (Flint, 1871).

The Fat Elk Creek bottomland, about 700 feet wide at the section line crossing was described as **"...a Willow & Alder Swamp full of Beaver & Dams. Would be good farming land if cleared & drained."** Surveyors Flint & Williams noted that the 7 feet wide Fat Elk Creek crossed back and forth over the section line five times in 200 yards. Beaver had dammed the stream, probably creating the swamp, and forcing the stream to meander within the creek bottomland. The current U.S.G.S. map does not indicate such a meandering, but maps the stream as a straight channel at the edge of the south boundary of the creek bottom. It was common that small valley streams were relocated along the edge of the valley floor to make farming more efficient (Figure 3.2.2.9).

Fat Elk Creek was not the only creek with beaver activity. Surveyors Flint & Williams, commented in their "General Description" in November, 1871,

> **"The swamp land along the streams in the Interior [T28S R13W] are generally made so by Beaver Dams. Can be easily reclaimed & will make excellent farming land."**

They in part confirmed their observation by describing the Lampa Creek bottom as they walked the line between sections 30 & 31.

44.00 chains. "Enter swamp."
48.00 chains. "Stream, 10 lks. N. (Beavers)"
51.00 chains. "Big Beaver pond of several acres about 2.00 chains [133 feet] S. of line."
"From 44 to 56 chs. line passes through swamp & beaver dams."

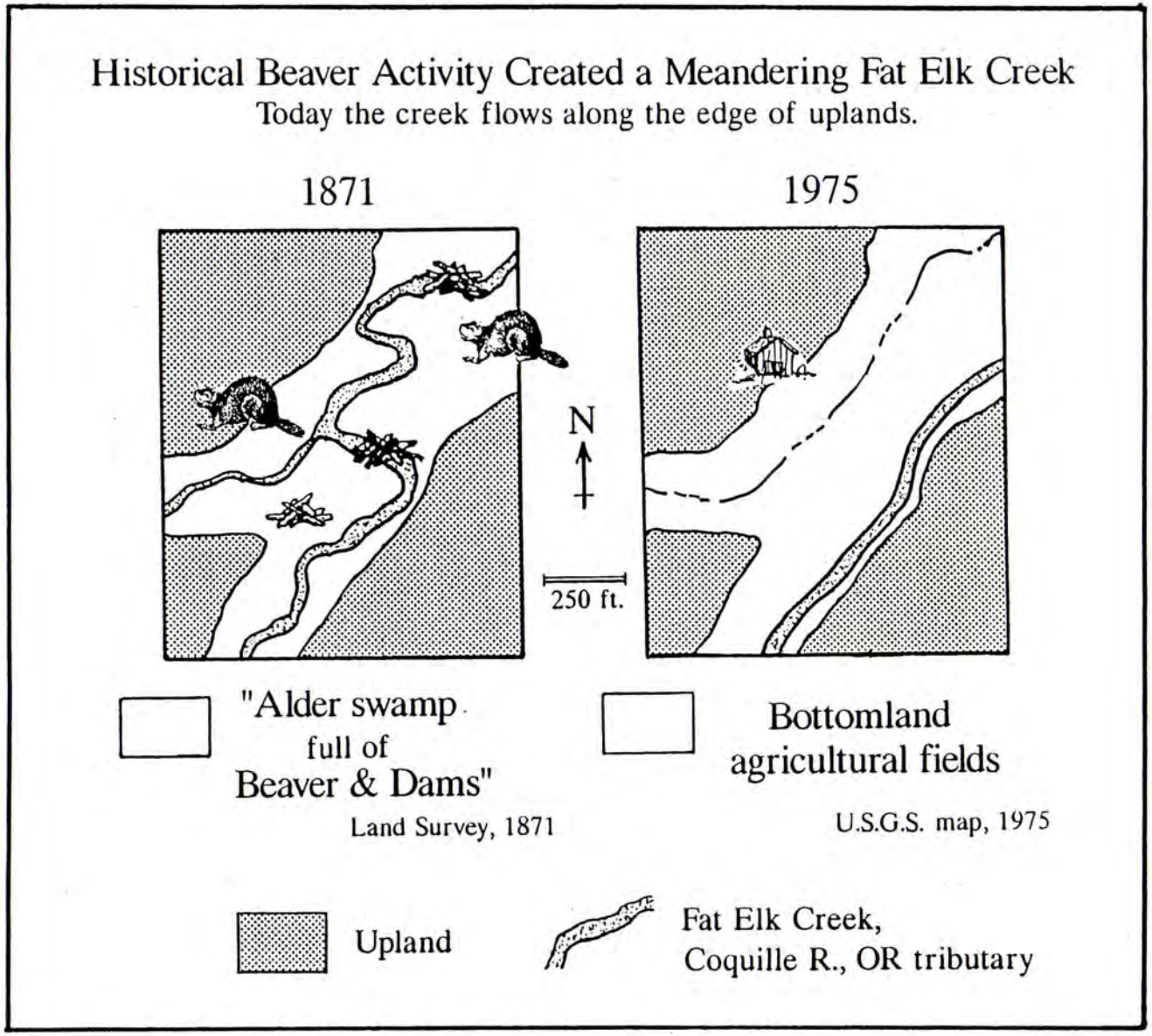


Figure 3.2.2.9. Fat Elk Creek, a Coquille watershed tributary that entered the Coquille from the south at about river mile 24.

Surveyors' Perspectives on Land Use

A primary reason for the original valley survey work was as a preparation for settlement. Land which was very mountainous or swampy was at first intentionally left unsurveyed, if it did not appear to the surveyor to have promise as developed land. Truax (September, 1858) chose to not survey some of the grass understory, timbered "miry marsh" areas of the north-eastern portion of Township 28S R13W across the river from current day Coquille City, commenting, **"This marsh extends West to the foot of the mountains and is unfit for settlement or cultivation, and is impracticable to survey."**

Along the northern boundary of section 5 in T28S R13W the Surveyor Murphy in September noted that the Coquille River bottom was, **"The River bottom is marshy and covered with water and impassible."** and, **"swampy bottom...land wet & swampy, unfit for cultivation. Undergrowth Willow & Crab apple."**

What is interesting is that Aiken did his survey work 14 years after the former surveyors, after a substantial amount of the valley land had been claimed by homesteaders (though only a portion of these lands had been cleared or otherwise altered.) Aiken tended to make note of marshlands, not only by its features, but also to comment on its potential as developed land after diking and drainage than Surveyor Murphy. In January he noted **"Marsh prairie river bottom...Land good mostly bottom, Marsh prairie. 1st rate when properly dyked and drained"** (Aiken, 1871).

Surveyors Flint and Williams, in November, 1871, also discussed the marshland's potential as farmland. The bottomlands adjacent to the left bank in section 30 at about River Mile 12 were described as **"Land swampy, & thick brushy bottom, wet. Would be valuable agricultural land if reclaimed."**

Just a little upriver, their description of the bottomlands adjacent to the left bank between River Mile 13 & 14 supported their assessment of the marshland: **"Swampy...The land which has been cleared is dry and first rate farming land. The uncleared land is very brushy & swampy."**

Across the river and southwest from the current day Coquille City, the land along the line between sections 3 & 10 in T28S R13W was described by Flint & Williams as, **"All Willow & Crabapple swamp. High grass & Beaver sign & c.... The swamp would be valuable for timber if could be reclaimed"** (Flint, 1871).

Aiken, Flint and Williams may have been more dedicated advocates for "selling" the frontier lands to potential settlers, or more informed as to the agricultural possibilities of drained lands

than Surveyor Murphy. Or, equally likely, the marshy bottomland was what tended to remain unclaimed in the lower valley by homesteaders by 1871.

Upland Forest Description

The upland landscape was surveyed with descriptions of **"mountainous," "land broken,"** or **"land gently rolling"** or **"hilly,"** and were generally found to be **"timbered."** The forests were composed of stands of hemlock-spruce-fir, hemlock-spruce-cedar or fir-cedar-hemlock mixes as the predominant species. The surveyors would list the predominant tree species in the forest mix (Table 3.2.2.3). The understory was described to be a mix of huckleberry, salmonberry, gooseberry, salal, vine maple, and/or often fern.

Land between sections 30 & 31 in T28S R13W: **"The mountain land is heavily timbered with valuable fir, cedar, hemlock & c. with the usual amount of Maple, Alder & c"** (Flint, 1871).

In the township (T28S R14W) "General Description" Surveyor Aiken wrote of the eastern half in 1871: **"I find large portions of this township covered with a heavy growth of green timber of various and valuable qualities and nearly all acceptable."**

In the hilly area in the south portion of the Township 28 South Range 14 West, between sections 34 & 35, Surveyor Aiken (January, 1871) wrote, **"Timber on the upland Cedar, Spruce, Fir, Hemlock, on the bottoms Myrtle, Maple, Crab Apple, Salmonberry brush."**

Along an adjoining section line in T28S R14W, the landscape was also described as **"hilly."** Aiken noted, **"Timber on upland Cedar, Fir, Hemlock, on bottom Maple, Myrtle, Alder, Spruce, underbrush Vine Maple, Crab Apple."**

The area which was being described was the Bear Creek valley area, a tributary to the Coquille, and a portion of the surrounding mountainous hillsides. Between sections 22 & 27 in T28S R14W, Aiken continued to describe the Bear Creek area timber as **"[Upland] Cedar, Fir, Hemlock, on bottom Maple, Myrtle, Alder, Spruce."** The Bear Creek bottomlands are from about one-fifth to one-half mile wide.

The upland vegetation in the western portion of Township 28 South, Range 14 West was described by the surveyor Matthew Murphy in the "General Description," in August, 1857.

> **"The land in this township that has been Surveyed is generally level Table land and heavily timbered with Fir, Hemlock, and Cedar, large portion of which is killed by fire..."** (Murphy, 1857)

At the corner of sections 25-26-35-36 in December, 1870, Surveyor James Aiken reported bearing trees varying from 1 to 3.5 feet in diameter. **

Tree	Diameter	Distance from Post
Spruce	3 feet	11 feet
Maple	2 feet	38 feet
Maple	1 feet	66 feet
Spruce	3.5 feet	54 feet

Three township maps for Range 14 West (Figures 3.2.2.10, 11 and 12) mentioned earlier in this section, also summarize upland tree data.

Maps of Historical Vegetation Data
Figures 3.2.2.10, 11 and 12.

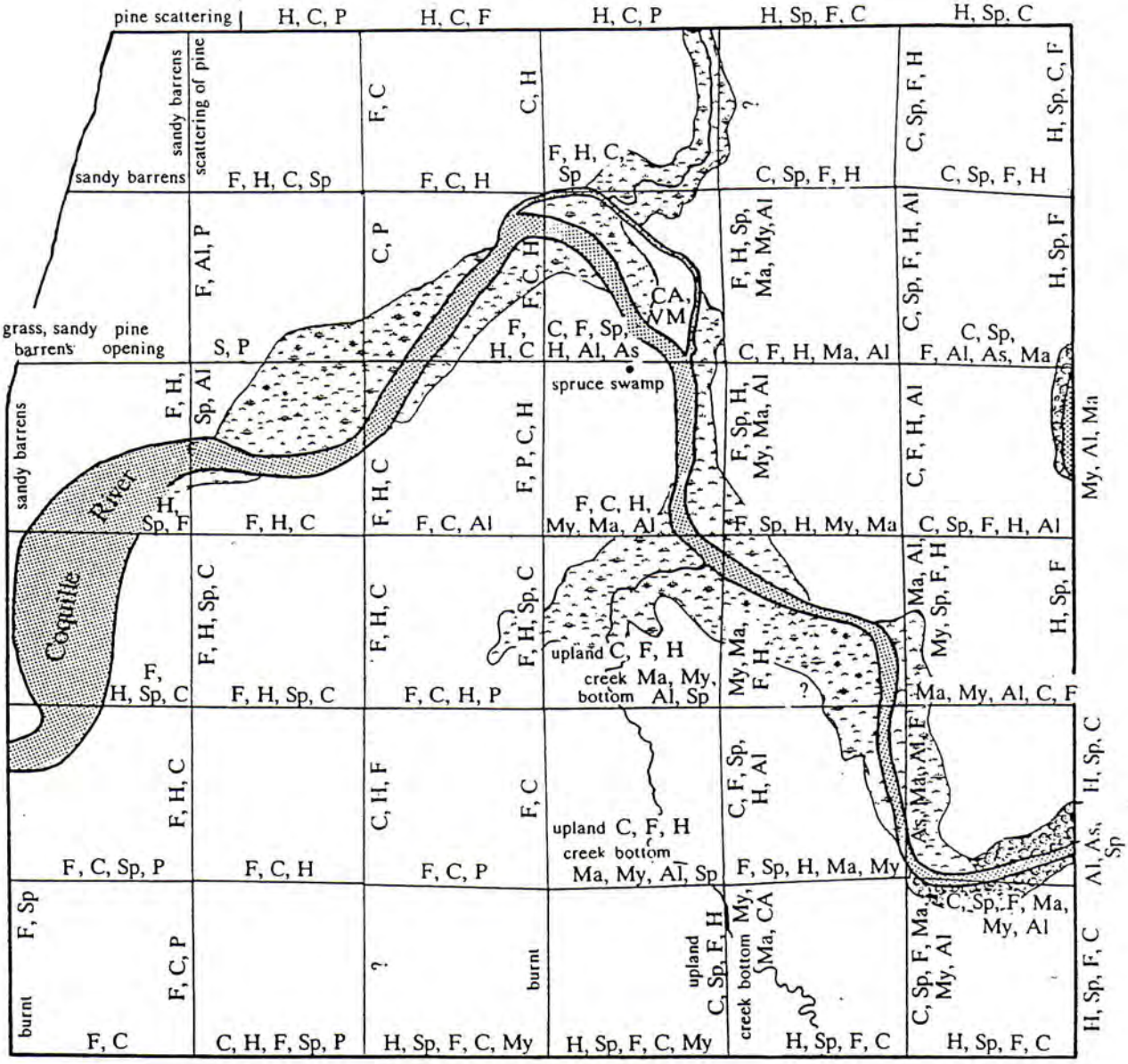
The three township maps on the following three pages (Figures 3.2.2.10, 11 and 12) for Township 28 South, Range 14 West, present vegetation data reported in the Original Land Survey notes. The first map "1800s Timber General Survey" (Figure 10), presents a summary description of the predominant tree species composition along a section line.

The second map, "Tree Type, Diameter and Location," is a summary of the survey bearing tree data from the Coquille River meander surveys that established the river bank location.

The third map, "Tree Diameter" reviews all of the survey bearing trees that marked section corners and quarter section posts.

1800's Timber General Summary

along Section Lines, Coquille River Landscape
as Reported in the 1857-1871 Original Land Survey Notes
Township 28 South Range 14 West



Tree Symbols

Al = Alder	H = Hemlock	P = Pine
As = Ash	L = Laurel	Sp = Spruce
C = Cedar	Ma = Maple	VM = Vine Maple
CA = Crab Apple	My = Myrtle	W = Willow
F = Fir		

1 section = 1 square mile

Marsh prairie

Timbered & brushy swamp

N

Tree types listed in order of predominance

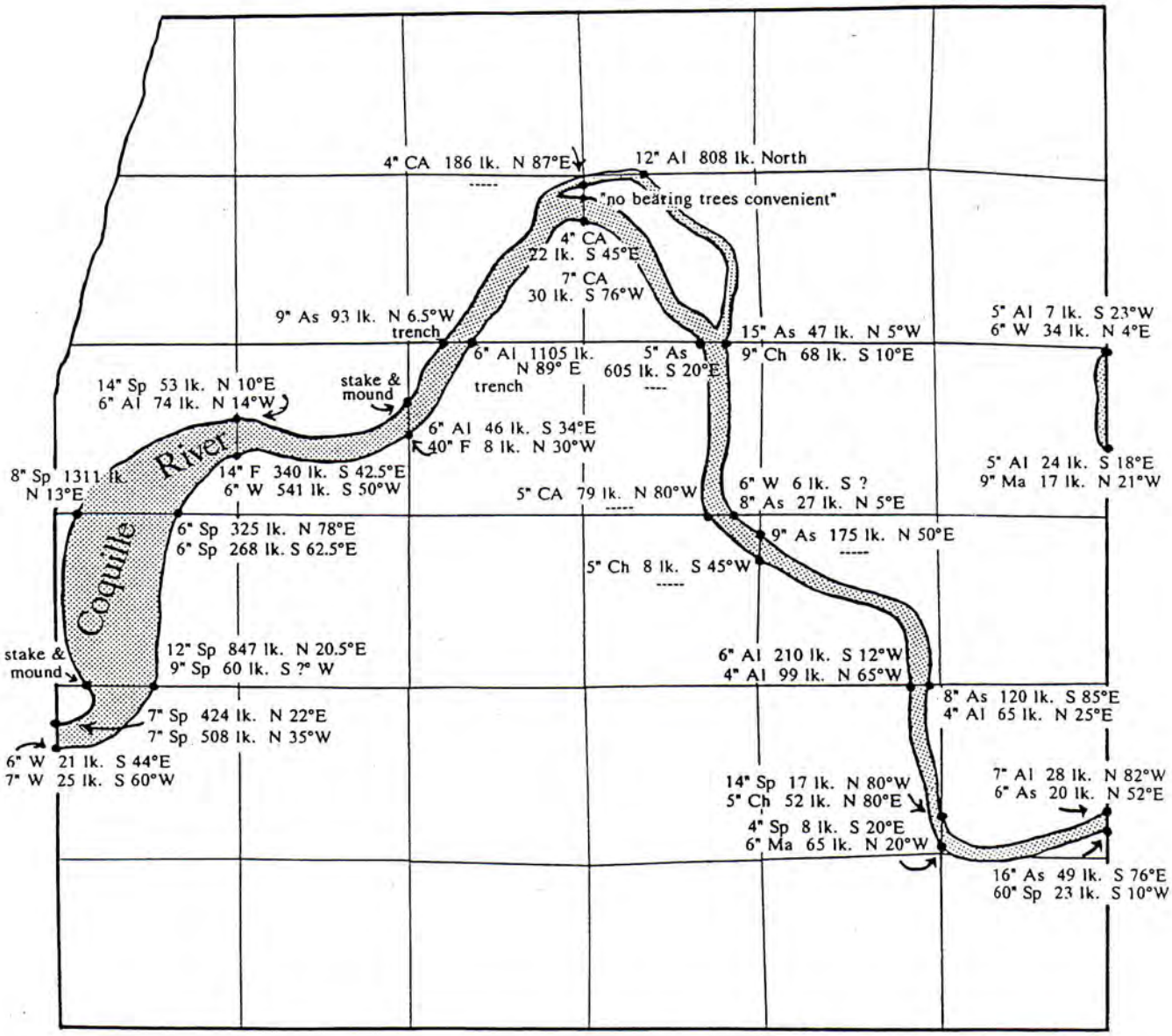
Figure 3.2.2.10.

Tree Type, Diameter and Location

at Survey Post Corners Near the Coquille River Bank

as Reported in the 1857-1871 Original Land Survey Notes

Township 28 South Range 14 West



Distances of trees from posts are measured in links.

1 link = 8 inches

one section = 1 square mile

survey post corner	diameter	tree	distance from post	direction
•	9"	Sp	47 lk.	N 28°W

N

Tree Symbols

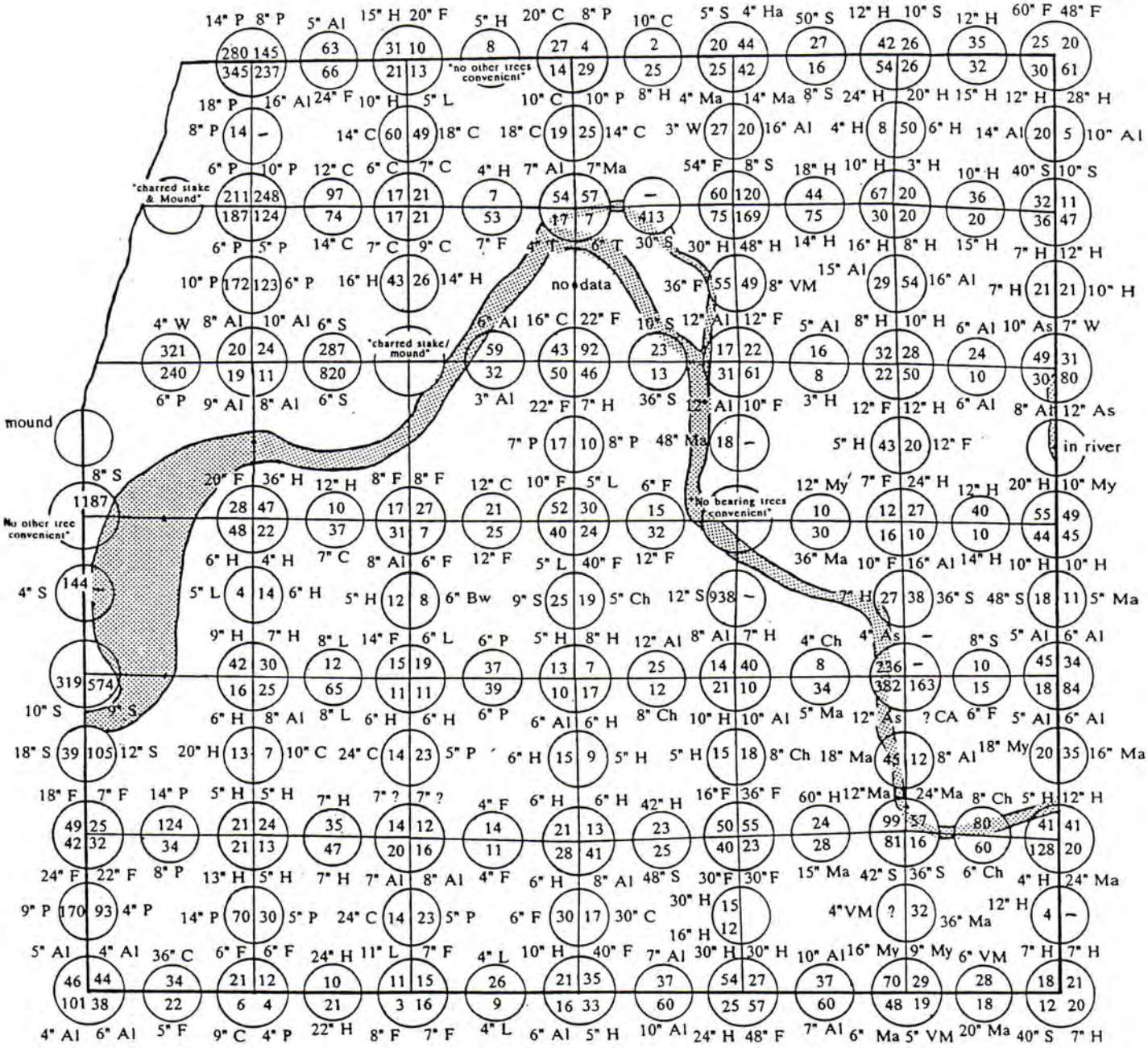
Al = Alder	Ma = Maple
As = Ash	My = Myrtle
CA = Crab Apple	Sp = Spruce
Ch = Chittam	VM = Vine Maple
F = Fir	W = Willow

Figure 3.2.2.11.

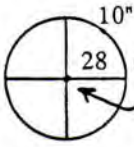
Tree Type, Location and Size

as Reported in the 1857-1871 Original Land Survey Notes

Coquille River Township 28 South Range 14 West



Distances of trees from posts are measured in links.
1 Link = 8 inches



tree diameter & type
distance from corner post in links.
section corner

1 section = 1 square mile

Tree Symbols

Al = Alder	F = Fir	P = Pine
CA = Crab Apple	H = Hemlock	S = Spruce
As = Ash	Ha = Hazel	T = Thorn
BW = Blue Wood	L = Laurel	VM = Vine Maple
C = Cedar	Ma = Maple	W = Willow
Ch = Chittam	My = Myrtle	

Figure 3.2.2.11.

"General Descriptions"

Some of the surveyors included a "General Description" of the lands which they had surveyed. It is worth including these summaries in their entirety to maintain the context of the descriptions.

General Description
Township 28 South Range 14 West
James Aiken, Surveyor
June, 1871

"The bottomlands bordering on the river is generally of a different character from those on the creeks. These on the creeks being a rich, sandy light loam, and those on the river of a heavy clay loam. Except right on the bank of the river here the soil is more sandy, and in many places it is more than half sand, and is from one to four feet higher than the land between this and the foot hills."

"On this narrow strip of land next to the river grows nearly all the timber and underbrush that is on those bottoms.. The timber consists of Spruce, Myrtle, Maple, Ash, Alder & Shittim. The underbrush consists of Crab Apple, Vine Maple, Willow, and kinds of brier bushes and vines, Wild Gooseberries, rosebushes, Salmonberry bushes and blackberry vines."

"All of the low parts of these bottoms is productive of various kinds of wild grasses. Two kinds of those grasses is good for grazing in the latter part of the spring and summer season. Known here as Marsh grass and Wild[?] red top, they both make an inferior quality of hay but answers for the purpose of wintering stock. In some places a certain kind of wild clover grows."

"In many places on this bottom a large coarse bunch grass known here as saw grass grows to the height of two and three feet, and two or three different kinds of rushes, where these grow nothing will for they monopolize the ground entirely. When they are destroyed and the land is properly drained all kinds of [?] vegetables and grasses are produced in abundance. These bottoms are all the wet and marshy and more [?] next to the foothills owing to the fact that nearly all the creek and spring branches from the hills run over the top of the ground some distance before they find a channel to convey the water to the river. There are many small channels making out from the river through the bottoms called here Sloughs. That afford the only natural drainage there is for them."

"And through these Sloughs and over low places on the bank of the river the tides overflow these bottoms from the month of October to June from 1 inch to 2.5 feet in depth."

"Most of this land in this part of this Township is now settled upon and Claimed by bonafied settlers."

General Description
Township 28 South Range 13 West
Flint & Williams, October, 1871

"The northeast part of the Township [T28S R13W] bordering upon the Coquille River is swampy...The Swamp is thickly timbered with Willow, Crabapple, and a Mixture of Alder and Ash, and has a dense growth of Coarse grass. Beaver are abundant, and a few other animals are occasionally seen, such as Muskrats, Wildcats, coon, Mink & c. Late in the summer & during the fall months it is a favorite resort for Bear & Elk."

"It would be valuable if reclaimed, but like the Beaver Slough it is but a few feet above the ordinary tide water of the Coquille River. At any considerable raise in the Coquille River the water runs through this swamp with great force from a point near the line between sections 2 & 3. It is valued for Cattle Range, but the floods of winter drowns large numbers unless they are driven out before winter sets in."

"The swamp bordering the River in the West part of the Township [T28S R13W] are wet & subject to overflow in the winter. They are nearly all claimed by settlers. Are perhaps a little lower than the Swamp further up the [Coquille] River. About a 6 feet raise above extreme high tides overflow them, but where they have been cleared off they appear to become pretty dry & produce vegetables & good grass."

"The swamp land bordering the [Coquille] River is wet and much overflowed during the winter Season, and does not become dry enough for stock to range through it until about August or September."

"The swamp land along the streams in the Interior [T28S R13W] are generally made so by Beaver Dams. Can be easily reclaimed & will make excellent farming lands."

General Description
Township 27 South Range 13 West
Surveyor Murphy, September, 1857

"...portion of it situated on the Coquille River is composed of low swampy bottoms extending generally a mile on each side and inundated with water, and impassible until late in the atum Months In the South Western portion of the Township."

"Two streams flow in a Southerly course to the Coquille River. They are Known as Beaver and Dead Man's Sloughs; all that portion of the Township is marshy and swampy."

General Description
Township 27 South Range 13 West
Flint & Williams, September - October, 1871

"The Bottom lands noted upon the small streams in the mountains are generally timbered with Maple, Alder, Spruce, Myrtle, Vine Maple & salmonbrier brush with wild grass & skunk cabbage. They are generally wet & swampy, caused so in great measure by Beaver dams, which might be easily removed,and the brush and timber cleared off thus making these narrow bottoms valuable for farming purposes. The soil is soft mucky and of a first rate quality, but these lands are not sufficiently extensive to accomodate any considerable number of settlers."

"The more extensive tracts of swamp land upon the Beaver Slough is level, of a mucky & shaky character and not over from four to six feet above the ordinary high tides of the Coquille River which flow about one and one-half miles up the slough - This extensive swamp is filled with a thick growth of Willow & Crab apple brush of from fine bushes to trees of 8 to 10 in. diam. with a mixture of swamp arrow wood, and occasionally a few scattering alder & Ash trees of a stunted growth. A thick & rank growth of coarse marsh grass grows everywhere and occasionally a few pond lillies & skunk cabbage is to be seen. Wet & dry places alternate all through the swamp and Beaver ditches & houses are often to be met[?] with. This swamp region is overflowed much of the time during the winter season by the freshets of the Coquille River and does not become dry enough for stock to range through it until about August or Sept. and in fact could not well be surveyed before that time."

"Nearly all the small streams emptying into the swamp from the mountain loose their channels near the margins, rendering it at this season of the year much more wet and miry along & near the mountains than farther out in the interior of the Swamp."

"Wet mire holes of the character of a quagmire were often encountered over which it was difficult to extend our lines, and frequently brush was cut & a species of brush bridge was built a head of us to prevent the surveying party from miring down."

"If this swamp region could be reclaimed by ditching and a Levy protecting it from the off repeated inundations of the Coquille River, it would soon become a valuable tract of ground. It is valued by the present settlers as stock Range yet it can only be used for that purpose a few months in the year - The Inhabitants interested appear to think it will soon be reclaimed. but no one has any definite idea how it is to be done. It contains a vast amount of Beaver and some few Muskrats, Minks, Wildcats, Coon & c. [etc] and at present is a favorite resort for Bear & Elk. Is an interesting piece of ground for the hunter & trapper."

"During the winter season the [Beaver] slough contains water sufficient for its easy navigation with Canoes, row Boats And even small scows, but during the summer season the water is low & nearly level and is only rendered navigable by the aid of Beaver dams which are built across at short intervals and thus a sort of slack water navigation was found to exist in 1853 by the water flowing back from one down to another, and the same Beaver dams are used and the same system of navigation exists at this day."

"Persons passing up the slough in a Boat or Canoe will encounter the first Dam at or near the head of tide water by which the water is raised & flows back a few hundred yards to the next one - The men at once get out into the water & remove a portion of the middle part of the Dam so that the Boat can be dragged over. The dam is then closed in order to keep the water from running away. So as to enable the Boat to reach the next dam above where the same process is repeated and even for about three miles or four miles by its sinuosities[?] from its mouth."

Table 3. Examples of Upland Tree Species noted along Section Lines of Township 28 South Range 14 West.

Uplands Timber	Understory
Hemlock, Spruce, Fir	Salmon & huckleberry, salal
Hemlock, Spruce, Cedar, Fir	Salmon & huckleberry, salal, Vine maple
Hemlock, Spruce, Fir	Huckle & salmonberry, salal, gooseberry, briers
Hemlock, Spruce, Cedar	Huckle & salmonberry, briers
Hemlock, Spruce, Fir, Cedar	Huckle & salmonberry, Vine maple, fern
Hemlock, Spruce, Fir, Cedar	Salmon & huckleberry, salal, Vine maple, fern
Hemlock, Spruce, Fir, Cedar	Salmon & huckleberry, salal, Vine maple, fern
Hemlock, Spruce, Fir, Cedar Myrtle	Salmon & huckleberry, Vine maple, laurel
Hemlock, Spruce, Fir, Cedar Myrtle	Salmon & huckleberry, Vine maple, laurel
Cedar, Hemlock, Fir, Spruce, Pine	Salmon & huckleberry, Laurel
Fir, Cedar	Manzanita, laurel
Hemlock, Spruce, Fir, Cedar	Salmon & Huckleberry, Vine maple, salal
Hemlock, Spruce, Cedar	Huckle & salmonberry, salal
Hemlock, Cedar, Pine	dense - Huckleberry, salal, laurel
Hemlock, Cedar, Fir	Huckleberry, salal, laurel
Fir, Spruce (burned)	Huckleberry, salal, fern
Fir, Spruce, Pine	Salal, huckle & salmonberry fern
(burned)	(dead undergrowth) Salal, huckleberry
Fir & Cedar	Salmon & huckleberry, Alder, salal
Fir, Hemlock, Spruce, Cedar	Salal, huckle & salmonberry, Vine maple
Fir, Pine, Cedar, Hemlock	Salal, huckleberry, laurel
Fir, Pine, Cedar, Hemlock	Salal, huckleberry, laurel
Fir, Cedar, Hemlock	---
Cedar, Hemlock	Dense: Salal, huckleberry, laurel
Fir, Cedar, Pine	Huckleberry, salal, fern
Cedar, hemlock, Fir	Huckleberry, salal, fern
Fir, Cedar, Hemlock, Pine	Salal, huckleberry, laurel
Fir, Hemlock, Cedar	Salal, huckle & salmonberry
Fir, Cedar, Alder	Salal, huckleberry, laurel

Table 3 (cont'd.)

Fir, Hemlock, Cedar (rolling)	Salal, huckleberry, laurel
Fir, Hemlock, Cedar (broken)	Salal, huckle & salmonberry
Cedar, Pine (level)	Dense: Huckleberry, salal, laurel
Fir, Cedar, Hemlock (rolling)	Salal, huckleberry, laurel
Fir, Cedar (gently rolling)	Dense: Salal, huckleberry, salal
Fir, Cedar, Pine (level, sandy)	Dense: Salal, huckleberry, laurel, fern
Fir, Cedar, Hemlock (lev./roll.)	Dense: Salal, huckleberry, laurel
Fir, Hemlock, Cedar (rolling)	Salal, huckleberry, fern
Fir, Hemlock, Spruce, Cedar (gently rolling)	Dense: Salal, huckleberry, laurel, fern
Fir, Hemlock, Spruce, Cedar	Salal, fern
Fir, Hemlock, Cedar (rolling)	Salal, huckle & salmonberry
Hemlock, Spruce, Fir (rolling)	Salal, huckle & salmonberry
Fir, Hemlock, Spruce, Alder (rolling)	----

3.2.3 Historical Bottomland Streams and Flooded Marshlands Associated with the Tidal Section of the Coquille

The historical accounts of large numbers of salmon on the Coquille and its tributaries in the 1860s suggest that, like the other coastal rivers in the Northwest, the Coquille provided quality and abundant habitat for juvenile anadromous fish and spawning areas for adults. The comment by John Flanagan, quoted in A Century of Coos and Curry by Peterson and Powers, summed up the 1860 historical scene on the lower Coquille:

> **"When we got to the river the salmon were jumping by the thousands...Old Jim...said, 'Begorra, sir, it's a pity to see all those fish go to waste. Somebody ought to catch them.'"**

The abundance of quality fish habitat was reflected in a large and successful early fisheries industry on the Coquille River. The U.S. Army Corps of Engineers 1879 Annual Report to Congress commented,

> **"the salmon fishery business is growing rapidly on the river, three firms being now engaged in it."**

Cannery records reported that between 1892 and 1922 the number of coho that were packed ranged from 30,000 to 50,000 or more per year, and generally 1,000 - 8,000 chinook (Nicholas, 1988).

In 1882 the Corps of Engineers noted exports from the Coquille area across the river-mouth bar in its annual report to Congress, and included cased, barreled, and fresh salmon in the export list. The number of fish that were exported in the early 1880s via the Coquille River mouth was reported to be exceeded in weight only by lumber exports (U.S. Army Corps of Engineers Annual Report to Congress, 51st Congress, 1st Session). The recorded exports shipped over the Coquille bar represented only a portion of the fish caught in the river, but reflected the significance of the fisheries industry to the local economy at that time. River fishing pressures played an early role in significantly reducing the runs of these historical populations of anadromous fish until 1956 when the river fishery was closed (Nicholas, 1988).

A fundamental determinant for the presence and size of the Coquille fish populations was habitat, both its availability and quality. The role and extent of the lower river, the associated bottomland tributaries, and marsh areas as habitat is not fully understood, in part because the limited amount currently present of such habitat. Many of the characteristics associated with these historical habitats have been lost since settlement.

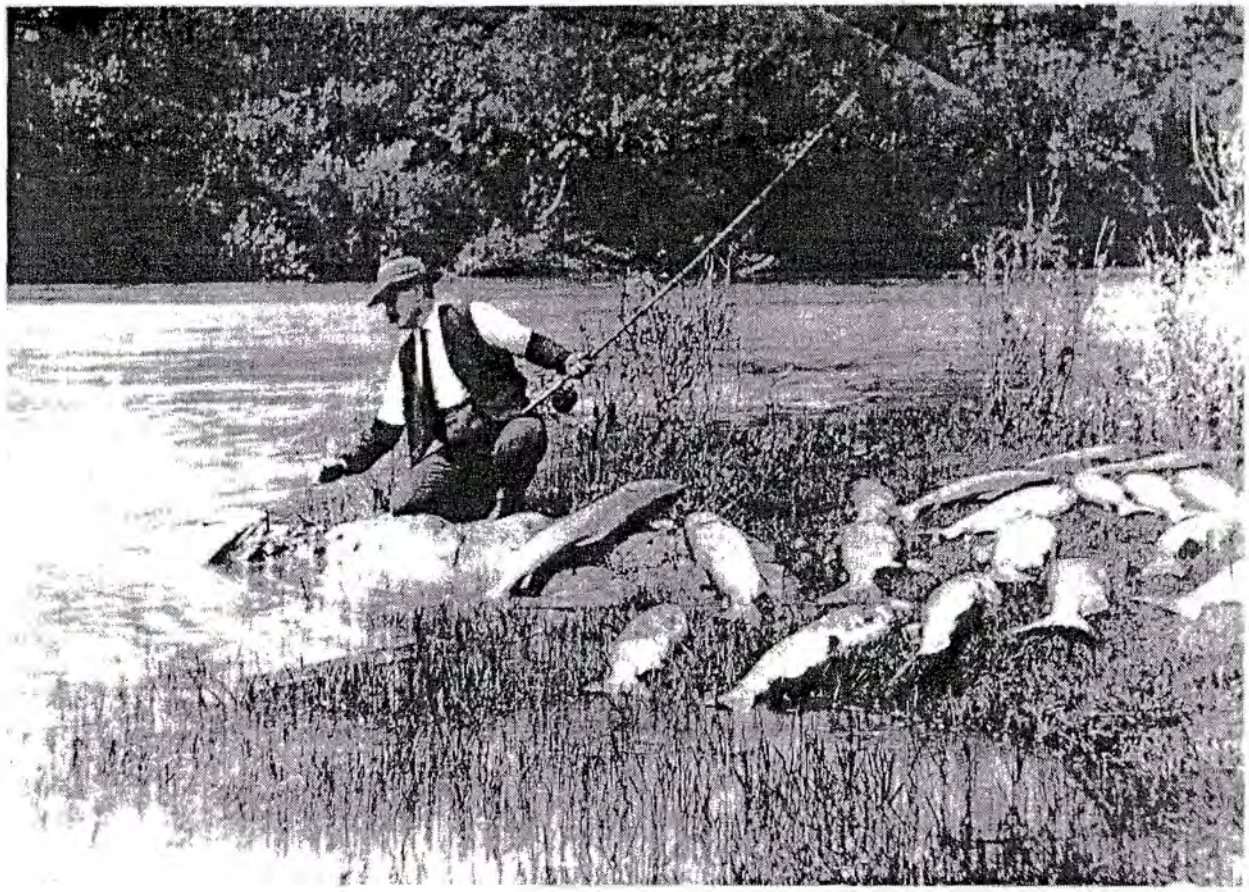


Figure 3.2.3.1. Early Salmon Fishing in the South Coast Basin (Courtesy of Douglas County Museum, J.R. Wharton, File # 1438).

Studies in the Northwest, however, have determined that juvenile salmon utilize tidal areas. In South Coast rivers such as the Elk River, coho appears to have been the major salmonid species in the early 1900s when the habitat features in the lower Elk River valley included multiple channels or sloughs, slow backwater pools, and numerous log jams, creating optimal habitat for coho juveniles (Reeves, 1991). The life history of juvenile Coquille coho obligates them to spend approximately 18 months in fresh water in the Coquille system prior to entering the ocean, and so could spend a significant amount of time utilizing whatever habitat is present in the lower river.

Northwest field research which monitored fish growth has suggested that juvenile coho grow at a faster rate in the estuary than the juveniles that remain upriver prior to smolt migration. In a study of coho salmon on Vancouver Island in the Northwest, it was found that a number of the juvenile coho inhabited the lower river of a small coastal system on the island. These salmon on the average grew from 1.8 to 2.3 times faster than the juveniles that remained upriver. The coho juveniles preferred areas that contained cover in the form of undercut banks, overhanging vegetation, and large woody debris (Tschaplinski, 1982). Studies done later in this creek documented the extensive use by coho of the more protected side channels off of the main river channel during the winter months (McMahon, 1989).

Field studies have also found juvenile chinook in the tidal Coquille in mid-March (Nicholas, 1988). Chinook can enter the ocean as late as October or November in the Coquille system, and so could be residents in the tidal portion of the Coquille for up to six or eight months. The abundance of quality habitat in the lower river could have furthered the presence of chinook and coho populations in the Coquille system.

Cutthroat is another species that is found to use Coquille bottomland streams and backwater areas (Messerle, 1991; Heikkla, 1991). The community of organisms that co-exist with, or are prey for, the fish benefit from aquatic bottomland areas as well.

The tidal section of the Coquille River at the time of settlement was linked with over 20,500 acres of bottomlands, 70% of which were marshy in character. Of these 14,400 acres of marshland, 87% were densely covered with trees and shrubs. The balance was grassy marsh (Section 3.2.2). Because there is substantial evidence that anadromous fish and other organisms use tidal reaches in coastal rivers, and seem to benefit from certain habitat features, it is worth describing in more detail the characteristics of the historical characteristics and conditions of these habitats.

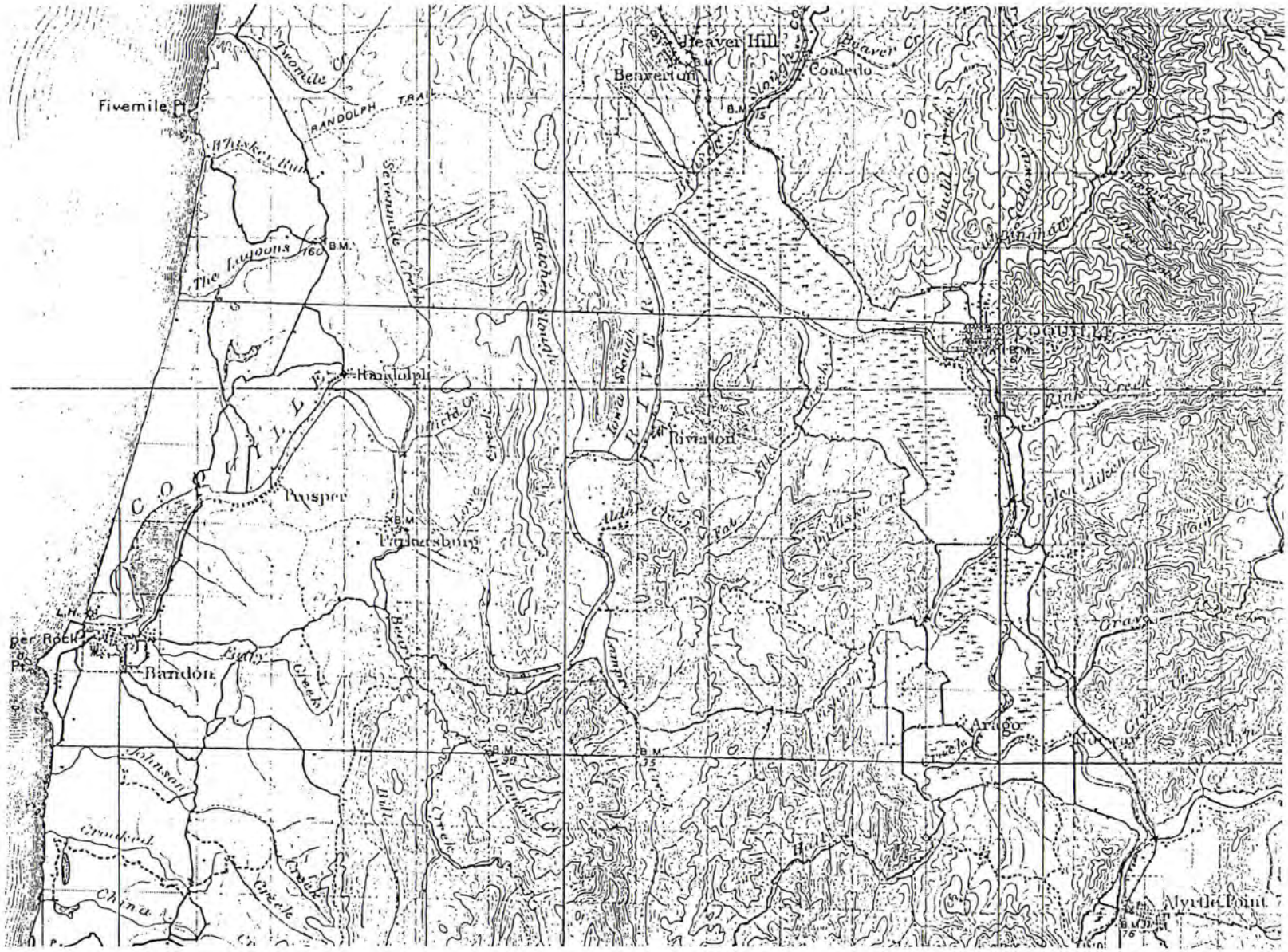


Figure 3.2.3.2. A U.S. Geological Survey topographic map of the Coquille tidal area in 1901. Note the larger tributaries in the bottomlands, and the loss of a defined channel for some of the smaller upland creeks when they entered the valley.

Historical Aquatic Habitats in the Bottomlands: Tributary Bottomland Streams

The three townships with 93% of the marsh tidal section of the river bottomland, Townships 28 South, Ranges 13 and 14 West, and Township 27 South, Range 13 West, were studied for a general estimate of the number and area of bottomland streams that were tributary to the tidal river in the mid-1800s. The Original Land Survey notes were the primary source of data.

Through the bottomlands traveled a number of creeks that were tributary to the tidal portion of the Coquille River. A conservative estimate of the total historical bottomland stream length and acreage was calculated in these townships, using the Survey Note data of stream intersections along one-mile survey section lines. About 30 miles of the Coquille run through these three townships. There were an estimated 57 miles of creek channel meandering through the Coquille bottomlands in these three townships. Based on the stream widths recorded in the survey notes, this distance of stream was estimated to create at a minimum 99 acres of stream channel habitat in these bottomlands (Table 3.2.3.1). This estimate does not include increased acreage from stream meandering or beaver-ponded areas.

Table 3.2.3.1. Historical Coquille Tidal Bottomland Streams. Conservative estimate based on 1858-71 Land Survey Data.

Township	Creek Distance	Creek Acreage	Acres of Bottomland
T28S R14W	12 miles	41 acres	2,664 acres
T28S R13W	38 miles	46 acres	7,545 acres
T27S R13W	7 miles	12 acres	5,181 acres
TOTAL:	57 miles	99 acres	10,009 acres

The channels ranged in size from as small as 8 inches in width (as reported by the surveyors) to 150 or more feet across. Some of the small creeks formed within the bottomlands from surface and subsurface flows draining the swamplands. The larger streams in the bottomlands generally originated in the uplands, and continued on, meandering over the bottomlands until they reached the Coquille River. These larger streams were commonly referred to as sloughs. Maps were reconstructed showing the section line

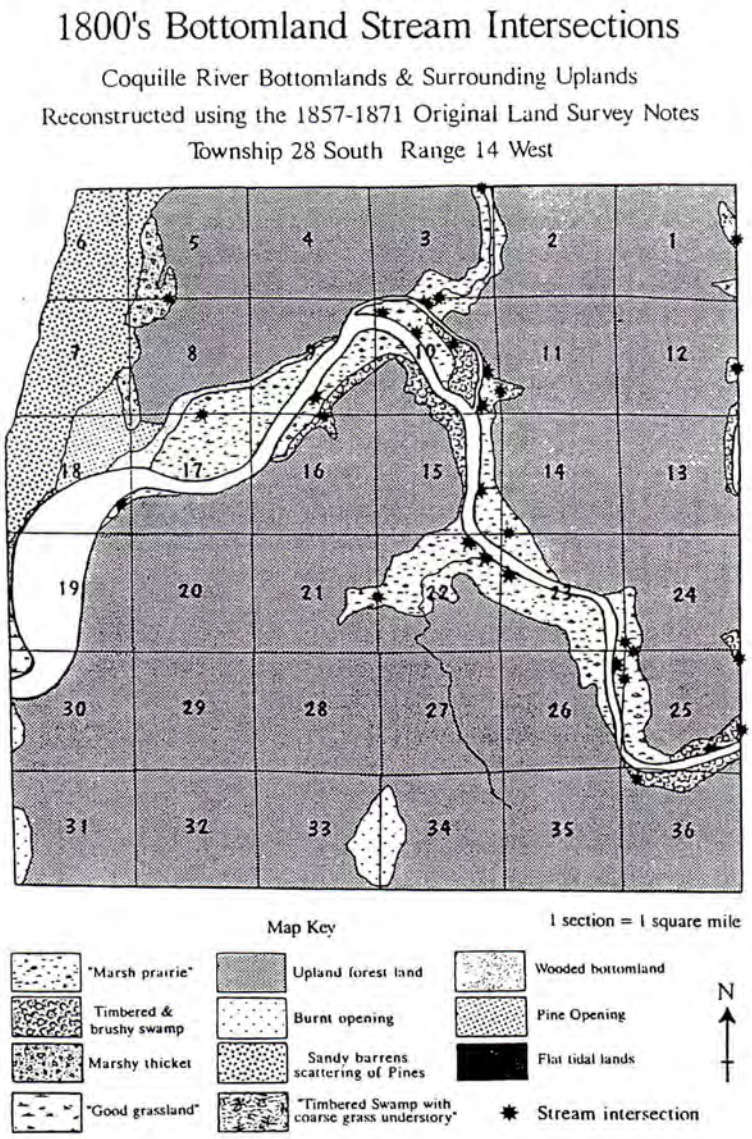
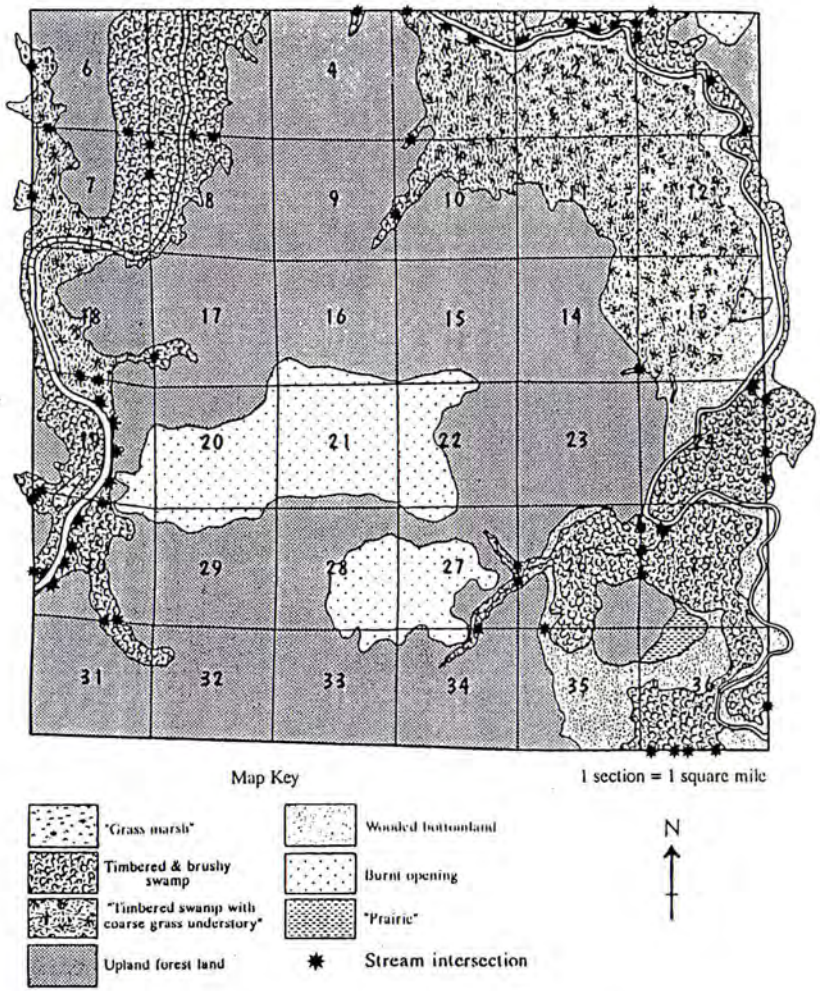


Figure 3.2.3.3. Bottomland stream intersections superimposed on two historical landscape maps for Township 28 South, Range 14 West, Coquille River bottomlands.

1800's Bottomland Stream Intersections

Coquille River Bottomlands & Surrounding Uplands
Reconstructed using the 1857-1871 Original Land Survey Notes
Township 28 South Range 13 West



Coquille River Bottomlands & Surrounding Landscape
Reconstructed using the 1858-1872 Original Land Survey Notes
Township 27 South Range 13 West

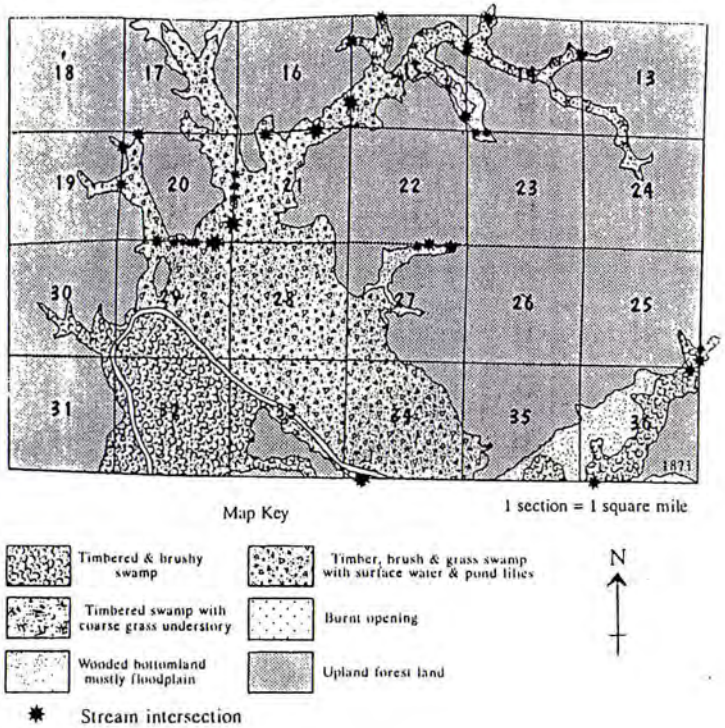


Figure 3.2.3.4. Bottomland stream intersections superimposed on two historical landscape maps for Townships 27 & 28 South, Range 13 West, Coquille River bottomlands.

intersection points for bottomland streams (Figures 3.2.3.3 and 3.2.3.4.).

The surveyors also reported tributary confluences of the Coquille River when they conducted the meander survey along the banks of the Coquille. They reported a total of 40 tributary confluences within the three townships, or an average of a tributary confluence every seven-tenths of a mile. This estimate excludes about 7.5 miles of river where one of the surveyors, Surveyor Meldrum (1867), failed to note any confluences, including tributaries such as Beaver, Hatchet and Iowa Sloughs that were indisputably present at the time of the survey.

Flooded Marshlands

In addition to bottomland stream channel habitat, extensive areas within marshlands of timber, brush and grass were covered with surface water for approximately three-quarters of the year, according to surveyors' descriptions. These areas considerably expanded, and may have been among the most significant portion of, an extensive seasonal historical aquatic habitat in the lower river. These submerged bottomland areas were covered with water beginning in October or November, and remained inundated until at least June, and in many areas into the latter portions of July and August.

According to Surveyor Murphy, who surveyed a good deal of the land in Township 27 South Range 13 West in 1857, he was required to abandon several survey section lines through marshy lands in mid-September, and walk an offset line because,

> **"...the river bottom is marshy and covered with water and impassible to continue the line... [this] Land low and marshy bottom...covered with water 3/4 of the year."**

He summarized his description of the bottomlands as,

> **"...that portion of it [Township] situated on the Coquille River is composed of low, swampy bottoms...and inundated with water, and impassible until late in the autumn months."**

From October through June the grass marshland downriver of about Parkersburg was also described by Surveyor Aiken in 1871 to be inundated with water:

> **"...over low places on the bank of the river the tides overflow these bottoms from the month of October to June from 1 inch to 2.5 feet in depth."**

There were several sources of this surface water. Portions of the marshy bottomlands were continuously submerged during the winter months by water originating from the Coquille River. Plentiful supplies of water were delivered as well to the marshlands during much of the year by smaller upland stream channels that disappeared upon reaching the bottomlands. Surveyor Flint noted of the land north of the Coquille River and west of Coquille City in late September of 1871:

> **"Nearly all the small streams emptying into the swamp from the mountain lose their channels near the margins, rendering it at this season of the year much more wet and miry along and near the mountains than farther out in the interior of the swamp."**

Surveyor James Aiken, in June of 1871, commented on the marshy nature of the bottomlands in Township 28S R14W:

> **"These bottoms are all the wet and marshy and more [?] next to the foothills owing to the fact that nearly all the creek and spring branches from the hills run over the top of the ground some distance before they find a channel to convey the water to the river. There are many small channels making out from the river through the bottoms called here Sloughs."**

The moderate to large-sized tributary streams that originated in the uplands maintained their channel through the Coquille bottomlands, but were ponded by beaver so that portions of these bottomlands were continuously flooded by these creeks:

> **"Wet an dry places alternate all through the swamp and Beaver ditches & houses are often to be met."**

So were the creek valleys immediately off of the Coquille bottomland flooded by beaver activity. Surveyor Flint remarked that,

> **"The bottomlands along the small streams in the mountains are generally timbered,...wild grass...[and] are generally wet and swampy, caused in great measure by Beaver dams."**

Beaver dams and slides ponded and retained water, maintaining aquatic habitat within marshlands well into the summer season. In 1871 Surveyor Flint described summer boat travel on the Beaver Slough aided by beaver:

> **"During the winter season the [Beaver] slough contains water sufficient for its easy navigation with canoes, row boats, and even small scows. But during the summer**

season the water is low and nearly level and is only rendered navigable by the aid of Beaver Dams which are built across at short intervals, and thus a sort of slack water navigation was found to exist in 1853..., the same Beaver Dams are used and the same system of navigation exists at this day."

"Persons passing up the slough in a boat or canoe will encounter the first Dam at or near the head of tide water by which the water is raised & flows back a few hundred yards to the next one - The men get out into the water and remove a portion of the middle part of the Dam so that the Boat can be dragged over. The Dam is then closed in order to keep the water from running away, so as to enable the boat to reach the next dam above where the same process is repeated..."

The historical Coquille bottomlands appeared to have drained slowly each year. The beaver furthered the retention of water on the land. It wasn't until a system of drainage ditches was developed in conjunction with a program of actively pumping the water from the bottomlands in the spring, that the land was made practical for agricultural uses.

"If this swamp region could be reclaimed by ditching and a levy protecting it from the oft repeated inundations of the Coquille River, it would soon become a valuable tract of ground...The inhabitants interested appear to think it will soon be reclaimed, but no one has any definite idea how it is to be done" [Flint, 1871].

Discussion Regarding Historical Habitat in the Marsh Bottomlands

The historical bottomland creeks and water-inundated bottomlands in the lower Coquille were an important component of the Coquille production system for fish and other organisms.

The bottomland creeks provided habitat, including extensive reaches of complex bank edges (bank areas with associated roots and overhanging vegetation) that are heavily used by juvenile fish. Marshlands that were inundated with surface water from late fall, through the spring season and into the summer, were a principal contribution to the availability of productive fish-rearing areas.

Beaver activity which ponded and stored additional water on large portions of these swampy bottomlands created and maintained

deeper-water areas and expanded available habitat area, retained nutrients, and extended the annual period of available off-river rearing areas for juvenile fish.

Preferred winter rearing habitat for juvenile coho include areas usually associated with abundant cover, beaver ponds, backwater pools and side channels. Preferred summer rearing habitat for juvenile coho are pools and beaver ponds (Reeves, Everest & Nickelson, 1989). Both the commonly inundated bottomlands, and the areas enhanced by beaver activity in the historical lower river landscape significantly expanded quality habitat.

As described in Section 3.2.2, substantially-sized trees grew on 85% of the marshy bottomland associated with a brushy or grass and brush understory. This vegetation canopy shaded creek waters, moderated water temperatures, created refuge spots during flood flows, and provided protective cover for juvenile salmon and other stream organisms. Leaf litter that fell from this vegetation provided a foundation for the food web in the creeks that included fish. A portion of the insects and other small organisms that lived, fed, and reproduced in the canopy fell into the creek as well to supplement food supplies.

Downed wood that either originated from the trees resident to the bottomlands, or was transported downriver and deposited on both the grass and wooded bottomlands, added structure and complexity to the aquatic habitats, including hiding and feeding areas for fish.

The vegetational community of the historical bottomlands have been for the most part replaced by agricultural fields. Most of these fields are now in pasture and hay fields. Juvenile salmonids are currently residents of remnant side channels, a drainage ditch network that has replaced the original bottomland streams, and the flooded winter fields (Messerle, 1991).

However, the winter standing water on the bottomland agricultural lands are promptly actively drained from the fields in the spring by a system of pumps and the drainage ditches. These ditches are periodically dredged to remove accumulated sediment, and are managed for the purpose of draining and diverting water from the agricultural lands. Some stretches of the drainage ditch banks are vegetated by trees and shrubs, but most banks are vegetated with grass.

Although these contemporary bottomland aquatic habitats are utilized by populations of juvenile fish, the lower river system currently lacks the extensive area and habitat complexity, and the prolonged periods of flooded marshlands common to the historical bottomlands, which were capable of supporting a sizable population of fish.

It is unreasonable to conclude that the entire lower Coquille acreage must return to the form of the landscape as it appeared in the mid-1800s. However, the knowledge and perspective of the appearance of the historical riverine system provides an important set of information to aid in landscape resource management. With this information, more effective management techniques can be developed for integrating the varied resource production uses of the lower river.

The numerous resources of the Coquille basin are within what might be described as a resource web and landscape network, yet traditional production methods have often targeted a single resource to the exclusion of other utilized resource components of the landscape. Even aspects of the landscape which complement and sustain the production of a target resource have at times been disregarded.

A recognition and better understanding of the role of the lower river historical landscape characteristics as an integral part of the functioning of a riverine production system, can aid in more effectively overseeing contemporary landscape resources of the Coquille and other coastal river systems while maintaining a a diverse use of the land.

3.3.1 Historical Presence and Removal of Large Wood from the Coquille River

Introduction

Prior to Euro-American settlement in the Northwest, large downed wood (recently coined "large woody debris") was found extensively in the streams, rivers and riparian corridors of the Northwest. Downed woody debris appears to have been so commonplace that trappers, journeyers and settlers didn't usually bother to comment on its presence unless the wood either threatened or saved their lives, or impeded their travel and generally was a nuisance. Travelers found that downed trees interfered with land travel on foot or by cart in the Oregon Cascades and the Coast Range. So did river travelers. Alexander McLeod, a Hudson Bay Company scout, described in his journal in 1826 that,

> **"Jeaudoin and his companion went in course of the afternoon some distance up the North branch of this River [Siuslaw] but finding the Navigation much impeded by fallen trees they returned at dusk conceiving the Obstacles insurmountable."**

The historical wood story was much the same for tidal sections of coastal rivers from the Columbia down to the Coquille and the Rogue, and the accounts were numerous. The Lewis and Clark expedition, as they traveled down the Columbia in 1805, found,

> **"...trees and Drift which was...very thick on the shore..on which we camped, and tossed them in such a manner as to endanger the canoes from being crushed by those monstrous trees many of them nearly 200 feet long and from 4 to 7 feet through."**

When Lieutenant Theodore Talbot traveled along the Oregon coast in 1849, he described,

> **"at the outlet of the Celeetz[sic] bay...We soon constructed a small raft for ourselves and baggage, the shore being strewn with thousands of drift logs.**

Probably one of the more spectacular reports of large drift along the coast was the account by William Brewer in his journal as he traveled in 1863 along the northern-most California coast by Crescent City.

> **"The floods of two years ago brought down an immense amount of driftwood from all rivers along the coast, and it was cast up along this part of the coast in quantities that stagger belief. It looked to me as if I saw enough in ten miles along the shore to make a**

million cords of wood. It is thrown up in great piles, often half a mile long, and the size of some of these logs is tremendous. I had the curiosity to measure over twenty. They were worn by the water and their bark gone, but it is not uncommon to see logs 150 feet long and four feet in diameter at the little end where the top is broken off."

These floods were a part of the same large storm event that rushed through and severely flooded the Coquille Valley in November of 1861. It did much damage to homesteaders' properties and in some cases convinced them to resettle on higher ground.

Figure 3.3.1.1. An example of an Oregon beach scene circa 1890s with large amounts of natural drift wood and also some cut wood that was transported from estuary banks and upriver watershed areas (Oregon Historical Society, photo. #943-A, Orhi26616).

After a confrontation with Native Americans in the Port Orford area in 1851, Captain William Kirpatrick and a number of other men escaped to the north, traveling through Coquille country. According to Orvil Dodge, Kirpatrick's journal log described their crossing of the Coquille at about river mile 6.5 at Randolph Island:

"We found a lot of dry drift wood and we soon made a raft large enough to carry the three men who could not swim and our guns...The river at this point was about 200 yards wide...When we reached the opposite bank and landed we supposed that we had crossed the river but we had only landed on an island and did not know until it

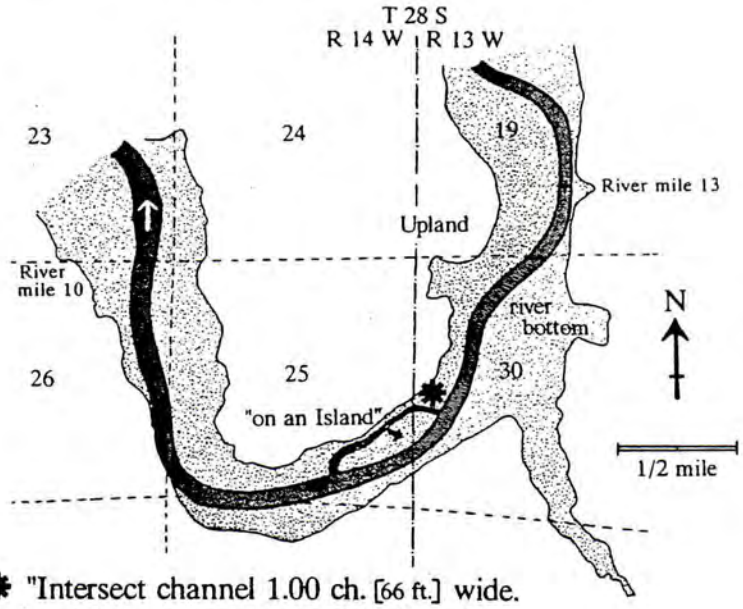
until we had taken all our ropes off the raft and let the logs go. We had not gone more than three hundred yards when, to our consternation, we discovered that we had another branch of the river to cross nearly as wide as the one we had crossed. There was not a stick of [downed] timber on the island to make a raft out of..."

According to Dodge, in another confrontation between settlers and Native Americans in 1853, a "rude fort" was apparently hastily constructed from,

"...logs on a sand ridge about 150 yards from the [Pistol] River and 100 yards from the ocean..."

When A. R. Flint, a surveyor who was more apt to describe landscape features, walked the meander line upriver along the north bank of the Coquille River in November of 1871, he noted a 66-foot-wide channel which branched off of the main river and created a half-mile-long island on the right bank about three miles upriver of current day Parkersburg. This channel and island no longer exist. Flint noted that the side channel was filled with wood (Figure 3.3.1.2):

"Intersect channel 1.00 [chain] **wide. Chained across on Drift wood with the aid of Boat."**



✱ "Intersect channel 1.00 ch. [66 ft.] wide. Chained across on Drift Wood with the aid of a boat."

Figure 3.3.1.2. Map constructed from 1871 Land Survey note data. These notes by Surveyor Flint documented a Coquille River tidal side channel entrance choked with large drift wood.

Possibly large woody debris, if sunken and out of sight in the deeper main channel, was less apparent and tended to be flushed out and then replaced during floods. The side channel trapped and accumulated wood.

The existance of this side channel was substantiated by the 1901 U.S. Geological Survey Geologic Atlas topographic map. On the map was drawn a small side channel and island at the same location where the surveyors crossed a side channel filled with wood. A stream entered this slough from the upland.

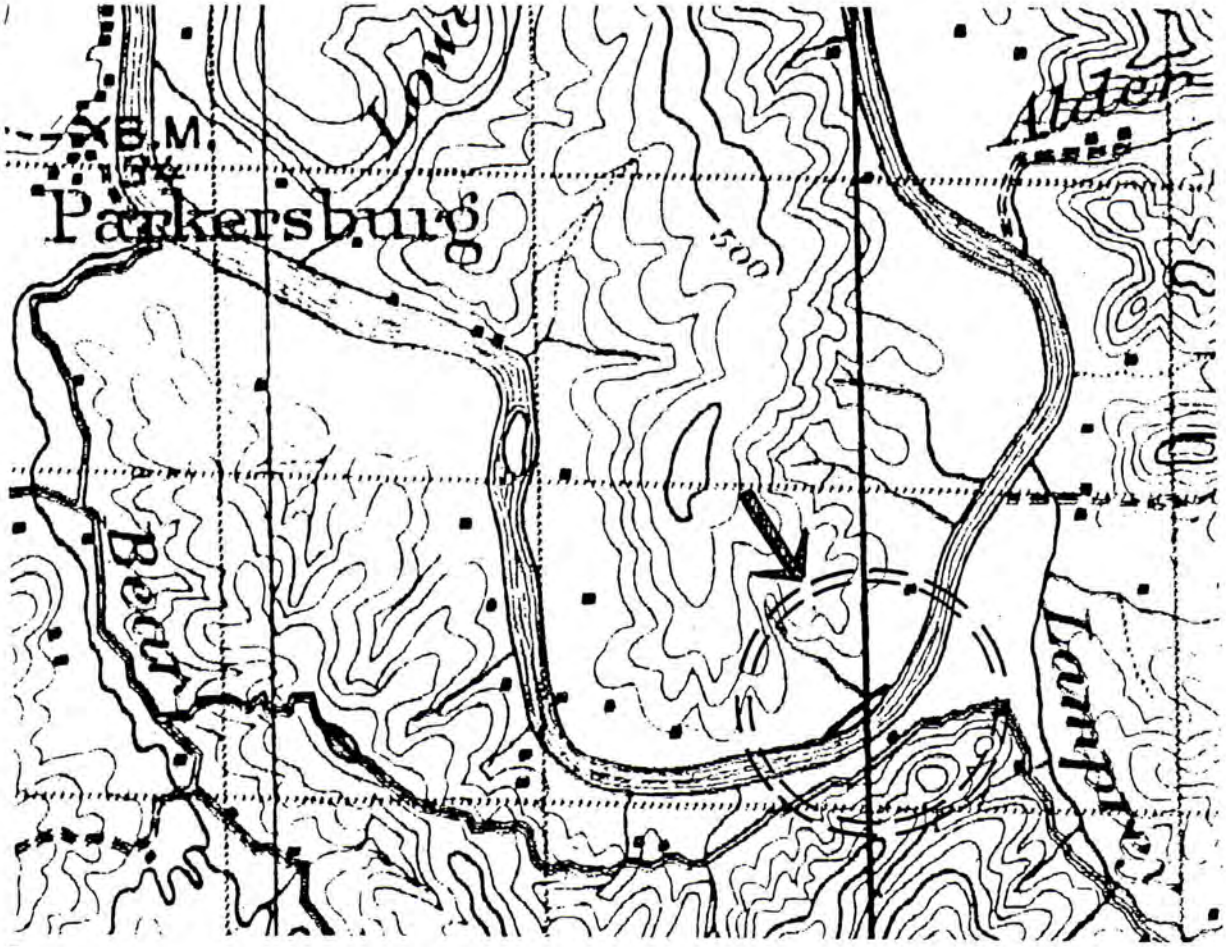
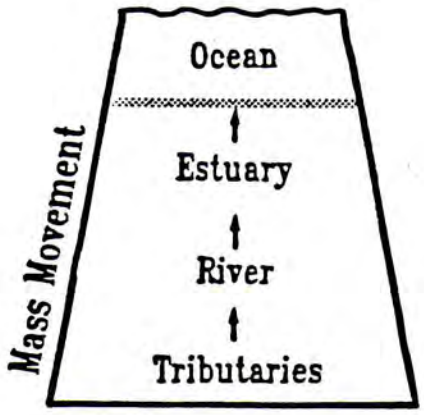


Figure 3.3.1.3. U.S. Geological Survey 1901 topographical map marking the presence of the small side channel noted by surveyors in 1871. This channel no longer exists.

Source Material for Tidal Large Woody Debris

The historical records from the early to the mid-1800s documented extensive "heavy drift" and freshet-transported old growth trees in tidal reaches of Northwest rivers. The sources of this wood included landscape-wide creek-to-estuary inputs. Because of this interaction between the land and the rivers, the forest lands played a major role in the structural characteristics of the lower Coquille and the other coastal rivers:



SOURCE: A River Basin Story

Figure 3.3.1.4. Historically, rivers and streams supplied lower sections of rivers with large quantities of wood (Benner, 1988).

The Original Land Survey notes documented a network of watershed streams surrounded by forests in the Coquille watershed (Section 3.2.2). Floods annually transported woody debris from the watershed. However, large pieces and volumes of wood were brought downriver in pulses during periodic large flood events.

In its 1895 Annual Report, the U.S. Army Corps of Engineers reported that,

> **"It has...been difficult to keep this portion [above Coquille] open. The drainage area is densely wooded, and every freshet brings down many stumps, logs, and trees..."**

The Original Land Survey also reported that the valley bottomlands were primarily wooded as well. The Daniel Giles manuscript, printed in the book Pioneers and Incidents of the Upper Coquille Valley by Alice Wooldridge, substantiates the survey report. In his manuscript, Giles described the bottomlands along the tidal section of the Coquille in 1854 as he canoed upriver:

> **"The river bottom was covered with maple, myrtle, ash and many other kinds of timber..."**

Probably the best account of trees as a lower river source of woody debris was Orvil Dodge's description of the trees lining the river banks of the tidal Coquille:

> **"...and, when white man arrived on the scene [tidal Coquille], in places their tops met and interlaced above the stream. Travel upon the Coquille is through scenes of enchantment, and the sluggish river seems like dim aisles in ancient cathedrals."**

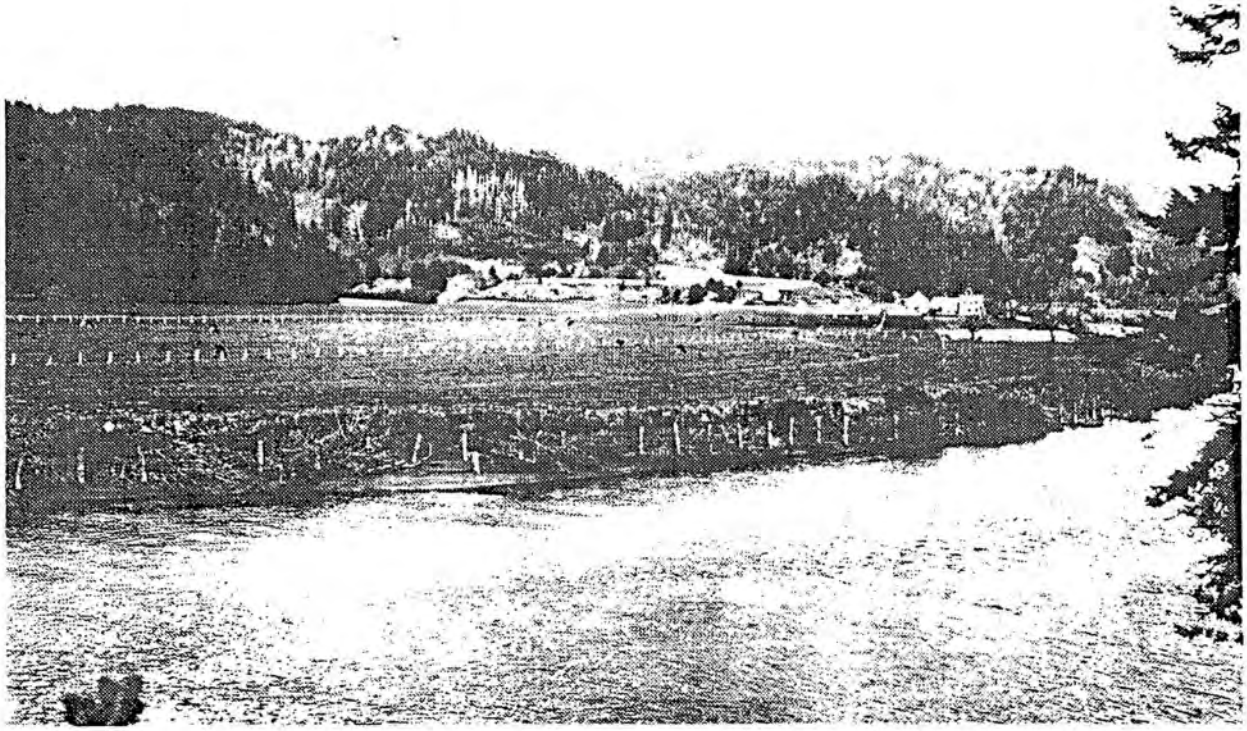


Figure 3.3.1.5. A more recent view of a section of bank along the tidal section of the Coquille River. Though this area was historically "marsh prairie" rather than tree-lined, just upriver the hardwoods created a canopy, ca. 1930s (Courtesy of Oregon State Univ. Archives, p.20:1341).

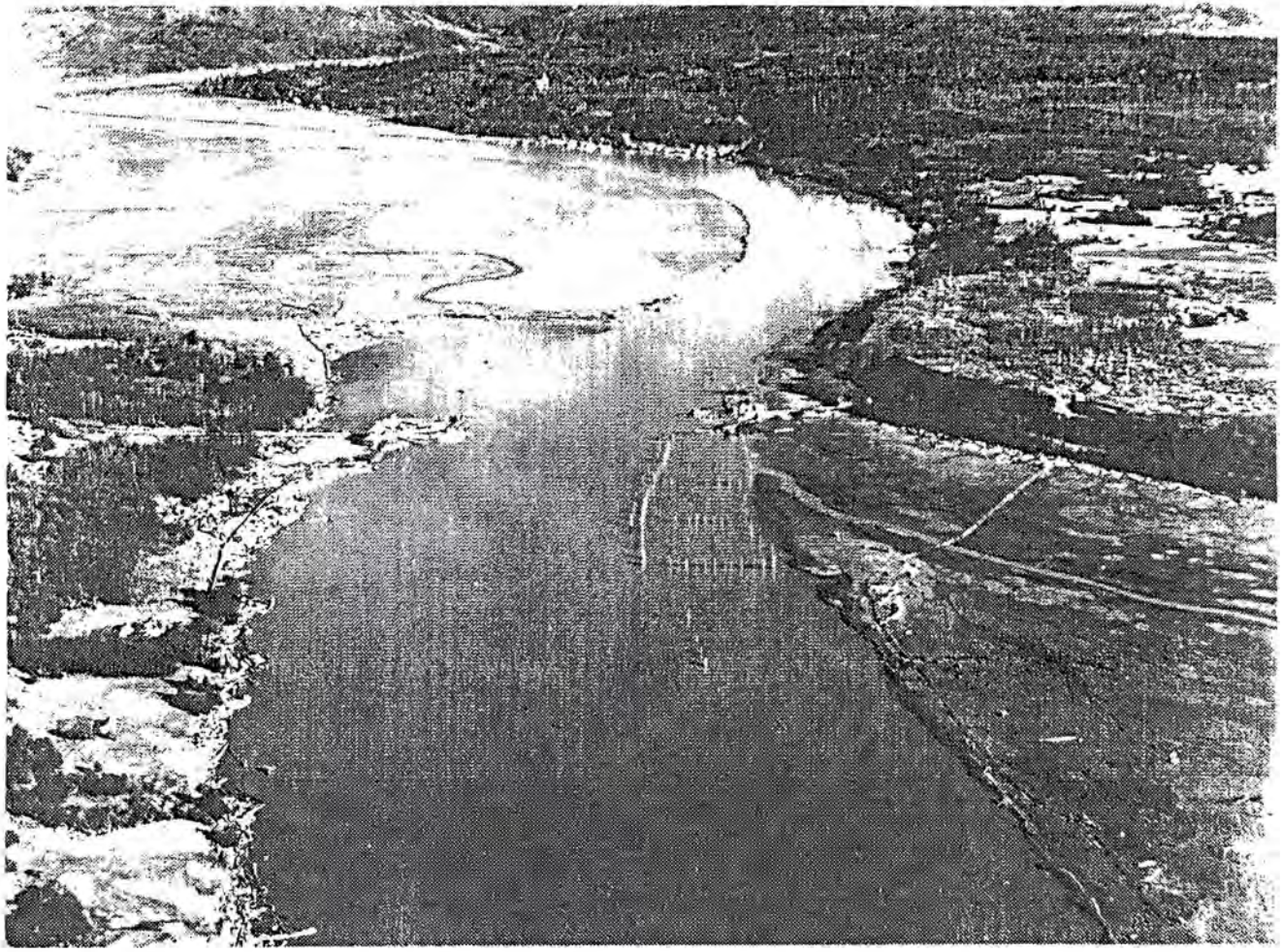


Figure 3.3.1.6. Large drift wood in abundance lined the estuary shoreline prior to the construction of the Rt. 101 bridge in 1956.

Historical Removal of Channel Wood and Source Material from the Coquille River and Connected Landscape

Removal of large wood, known as snags, from the tidal and upriver sections of the Coquille River began soon after settlement to clear the channel of obstructions. Alhough there are no records of private efforts to remove snags, channel wood created problems for not only commercial boat traffic, but also for the gill net fishermen that operated on the river until river gill netting was outlawed by the State Legislature in 1925.

The U.S. Army Corps of Engineers became involved in tidal section Coquille River channel maintenance in the late-1880s. A large motivation for their commitment to channel work, however, was the need to dredge to restore the channel to navigable depth in places where the river had begun to shoal (Section 3.3.3).

During the period of time between 1889 and 1902, the Corps periodically pulled snags from the 37 miles from Myrtle Point to Bandon. Between 1902 and 1924 the Corps maintained the river the 25 miles below the city of Coquille. A total of 6,407 snags were removed during this period until the Corps abandoned its channel maintenance projects on the river above Bandon (Table 3.3.1.1).

Table 3.3.1.1. U.S. Army Corps of Engineers Snag Removal on the Coquille River between Myrtle Point and Bandon, 1889 - 1918: From the Annual Reports to Congress.

Fiscal Year	Spent	Snags large	Snags small	Stumps	Scow loads of Drift
1889-1890	$4,000	1,066			
1890-1891	$3,000	327		12	69
1892-1893		979			12
1894-1895		194	181		8
1895-1896	$632.75	168			
1896-1897	$925.00	246			
1879-1898	---	260			
1899-1900		250			
1900-1901		237	378		
1910-1911		1,505			
1911-1912		606			
1914-1915					
1915-1916	$3,700	280		+100 snags & sunken logs	
1916-1917		15		20 sunken logs	

Total: 6,748 snags over a 14 year period
88 scow loads of drift & about 60 sunken logs

The Port of Coquille was formed in 1911 to assume the responsibilities of maintaining the Coquille River on the section of river that was no longer regularly maintained for navigational purposes by the federal government. Their downriver jurisdiction boundary was established on the main river at Fishtrap Landing above the city of Coquille. (The agency also improved channel navigability, chiefly for log drives, on the North, East and Middle Forks, and Middle Creek.)

The Port intensively worked to maintain a navigable channel up to Myrtle Point for at least 8 years. Over that period the Port reported to have removed 1,890 snags. Between both the Port and Corps snagging efforts, an average of roughly 8 snags per mile per year were removed from the channel below Myrtle Point. The number per year dropped only slightly during this period.

Although more snag work may have been done at a later date, the Port of Coquille archives do not have any record of snag and dredge work on the river below Myrtle Point after 1923. The Port of Bandon, the lower river port agency, was formed at about the same time as the Port of Coquille, and they have periodically dredged and snagged the channel over the years.

Table 3.3.1.2. Port of Coquille Snag Removal on the Coquille River, 1916 - 1923. Data compiled from the Port of Coquille Foreman's Reports.

Fiscal Year	Channel Distance (in feet)	Snags Removed Large	Snags Removed Small
1915 - 1916	4,058	212	733
1916 - 1917	16,936	318	353
1917 - 1918	1,575	56	0
1918 - 1919	3,110	9	0
1919 - 1929	4,995	15	49
1920 - 1921	6,274	5	9
1921 - 1922	8,014	16	27
1922 - 1923	7,380	6	15

Total Snagged: 1,890 snags over a 9 year period. (704 large snags & 1,186 small snags)

Total Channel Distance: 52,342 feet = 9.91 miles

As mentioned earlier, most of the Coquille River and its tributary riparian lands were forested. Some of the earliest trees to be cut for lumber and land-use clearing were on the lands immediately adjacent to the river and the major tributaries. For many years the only type of transportation of logs down to the valley mills was by river, and so the stands of trees most convenient to harvest for timber were along these streams.

The U.S. Department of Agriculture 1911 Soil Survey of the Marshfield Area, Oregon commented that in the Coos County area,

> **"...along the larger streams much of the virgin timber has been removed, and has been replaced by a thick and almost impenetrable growth of fir, spruce, alder, and other small trees."**

In the Corps' 1909 Annual Report to the 62nd Congress, a comment was made describing watershed logging:

> **"Logging is carried on extensively on the headwaters for distances of 30, 26, and 18 miles above Myrtle Point on the north, south and middle forks, respectively."**

The source community of large riparian stands that provided large wood transported down tot eh estuary during major flood events were the firsat to be cut.

Lumber exports comprised the majority by weight of exported goods. Figure 3.3.1.7 summarizes lumber exports across the Coquille Bar, though after 1894 the railroads to Coos Bay offered another export route and so these data do not represent all the wood that left the area. These data also did not include wood products.

Not only was lumber exported, but shingles, vessels, match wood, cord wood, laths and broom handles were manufactured in the area and made their way to San Francisco.

Land clearing for homesteading purposes also diminished natural inputs of wood into the fluvial system. Channel clearing of wood from the Forks and tributaries above Myrtle Point for small boats and log drives also diminished natural channel wood inputs to the lower river.

As natural sources of wood inputs declined, anthropogenic sources increased. Logging slash, escaped logs and land clearing waste entered or was placed in the channel. It was illegal, however,

to dump refuse in the river, and individuals who did so were often warned or fined and asked to remove the material before high water. Gradual bank erosion problems associated with riparian vegetation clearing in some cases may have initially deposited more wood into the river, though if the thin strip of trees left after land clearing fell in, no new sources of potential wood inputs replaced the losses because the land was cleared of woody vegetation behind them.

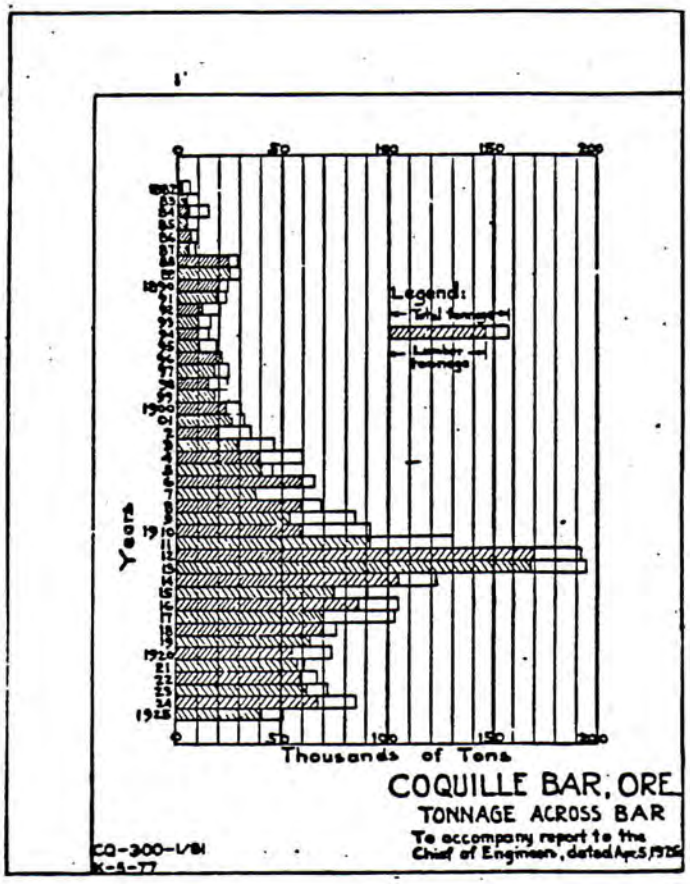


Figure 3.3.1.7. Lumber exports across the Coquille Bar, 1881-1925. After 1894 the railroads to Coos Bay offered another export route and so these data don't represent total exports.

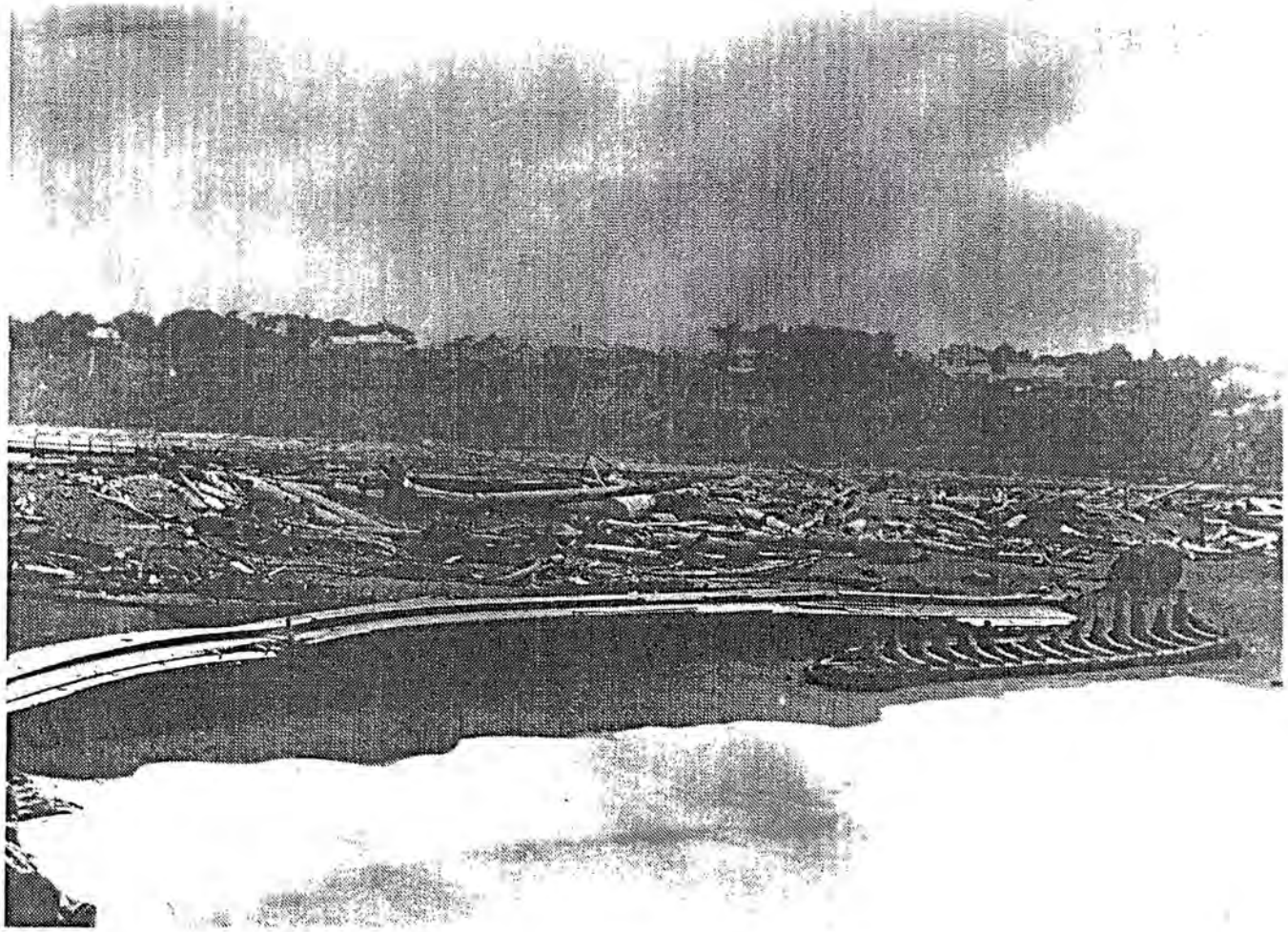


Figure 3.3.1.8. The Coquille beach strewn with drift wood and remnants of a boat in 1909 (Courtesy of the Bandon Historical Society).

Coquille River Mouth Recent Woody Debris
1939 - 1985

One indicator of the amount of source material from inputs of wood and its residence time in the tidal section of the Coquille is an inventory of amounts and sizes of river mouth woody debris. The 1800s U.S. Army Corps of Engineers maps noted extensive amounts of drift wood at the Coquille Mouth (Figure 3.3.1.9).

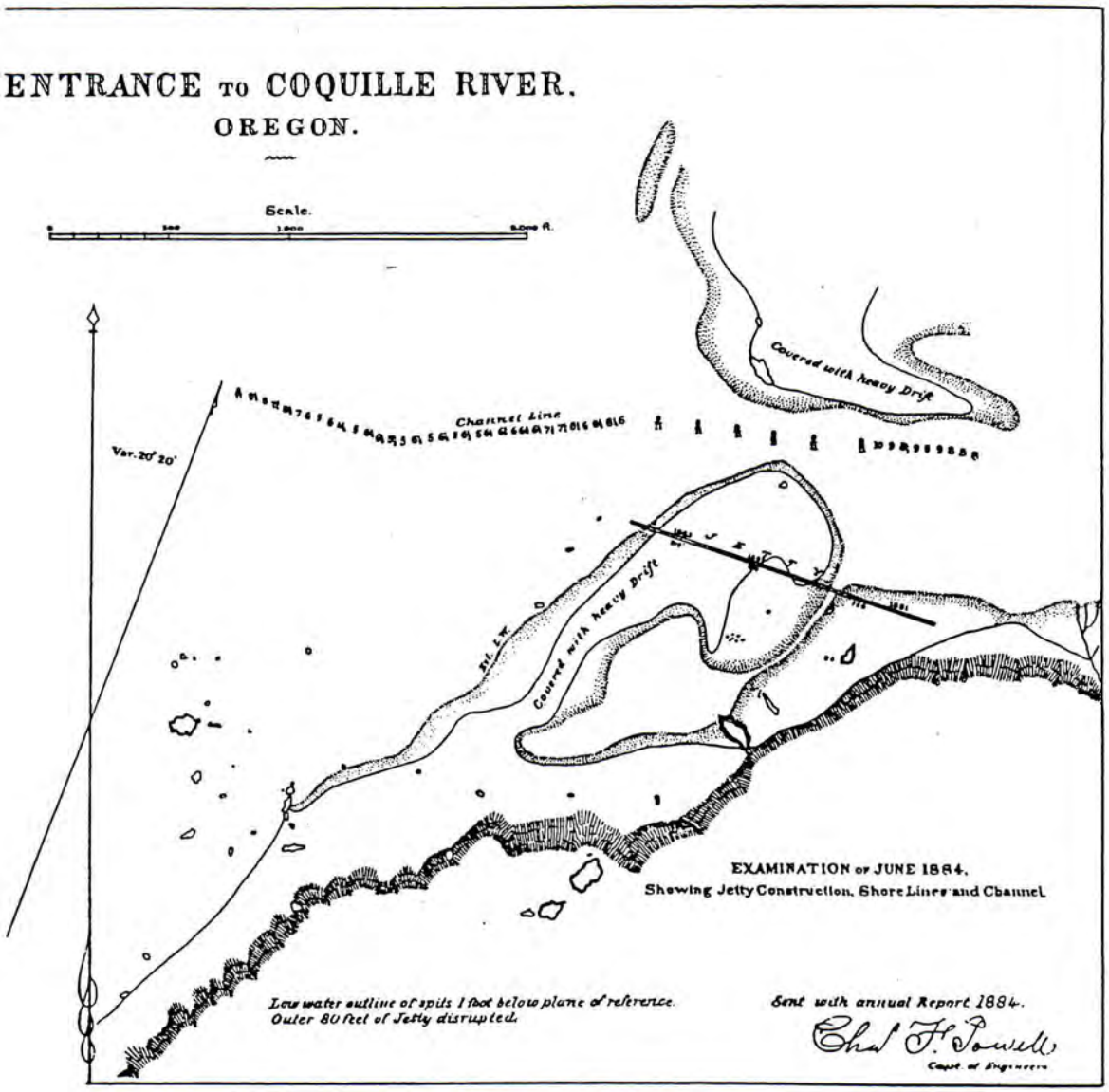


Figure 3.3.1.9. Driftwood at the mouth of the Coquille River, adapted from U.S. Army Corps of Engineers historical map, 1884 (Report of the Secretary of War, Annual Report to Congress).

An aerial photographic study by Benner and Sedell in 1987 documented that the average volume of wood at river mouths along the Oregon coast declined by 76 percent over the fifteen-year period between 1970 and 1985. The volume of wood at the mouth of the Coquille declined by 60 percent.

The Coquille River mouth wood has changed both in the volume and size of individual pieces since 1939. Although the 1939 photographs were not of a scale that a quantitative comparison could be made between that date and more recent years, the volume of wood on the beach was substantially greater than in 1970. The lengths of the commonly occurring larger pieces of wood at the river mouth in 1939 were substantially longer than the longest pieces in both 1970 and in 1983 shortly after a one-hundred year flood event on the South Fork.

After this 1981 flood, the only wood pieces that were present were stumps or other short chunks and pieces of wood, and even though their cumulative volume was greater than the 1970 volume of wood, in two years most of the wood had washed away so that only 43 percent of the volume remained.

In 1939 there were 13 pieces of wood 10 meters or longer within the sample sites, and the longest was 18 feet. After the 1981 flood, the longest piece of wood was 9 meters (there was only one that size), the second largest piece was 7 meters, and the majority of pieces were fewer than 4 meters long. Size of the wood influences the length of residence time in the area, as it may require higher water velocities, flows or waves to move big pieces. As mentioned in 3.3.2, the wood plays structural roles in the landscape.

Table 3.3.1.3. **Coquille River Mouth Wood: 1970 - 1985.**
(Unpublished data, Benner and Sedell, 1990.)

Year	Cubic Meters Volume of Wood		Wood Number of Pieces *	
	Site 1	Site 2	Site 1	Site 2
1970	112	222	252	690
1975	69	170	153	686
1977	45	-	144	-
1981	38	98	109	259
1983	195	111	393	454
1985	66	68	147	190

***Pieces of wood 0.5 meters of greater were measured, and many of these pieces were less than a meter in length.**

The present day decline of wood in the lower river may be attributed to a number of reasons, including: Forest Practice regulations enacted in the 1970s that mandated that wood be removed from tributaries at logging sites; increased use of wood for home wood stoves; fewer lost logs from river log drives and boom storage that substantially contributed to wood inputs; and natural attrition over time after the 1964 approximately one-hundred year flood event.

The number of wood permits that were issued by the Forest Service after wood stoves came into vogue in the 1970s increased more than seven-fold (Gonor, et. al., 1988). Quality wood that is reasonably accessible along the estuary is generally salvaged for wood by individuals.

It is evident that human influence on inputs of wood to the lower portion of the Coquille and other coastal rivers have been significant since settlement. Whether the wood was brushy debris disposed of by farmers (though early federal and Port of Coquille regulations prohibited the introduction of debris into navigable waterways), or escaped logs from river-transport activity, there were regular inputs of wood into the river system. However, the historical amounts of wood that were documented to be on beaches and in coastal rivers prior to settlement were similarly abundant as well as large in size. Presently there is neither the source of wood available, nor the anthropogenic input that there was in historical times. When the wood does enter the system it is often removed because it threatens property or conflicts with other river uses.

3.3.2 The Roles and Impacts of Large Wood in the Coquille River and its Tributaries

In many respects, the value of wood to humans has long been recognized. The historical rise and decline of some societies has been attributed in part to the supply of wood. The historical uses of wood have included material for the construction of dwellings and ships, to a source of energy to heat homes or for the creation of plaster and iron tools (Perlin, 1989). With respect to these uses it has been easy to recognize the role of wood within human societies and its significance to people.

The significance to humans of wood in river and stream channels has not been appreciated in the same manner that we have acknowledged the function of wood within the context of our immediate domain. The beneficial relationship between large wood in channels and humans is often an indirect one, connected through benefits stemming from a healthy stream landscape. In addition, the ability of large wood to physically obstruct or alter a stream or river has at times been in conflict with a number of societal uses of these channels or the adjacent land.

To fully appreciate our traditional attitudes toward large wood in river and stream channels, we must consider wood management within an historical context. Rivers and streams were once used extensively for the commercial transportation of goods and people at a time when transportation options were limited. Rivers and their larger tributaries also played a key role in the movement of large numbers of logs to downriver mills. Management of channel wood and bank vegetation for river transportation was a critical step in the molding of these channels for these specific roles. More recently, as society turned to fish management to fortify ailing fish populations and restore the original numbers of fish, it was at first thought that even moderate amounts of erosion sediment in streams was detrimental to fish, and that wood jams blocked their passage.

Over the last ten to twenty years, biologists have gradually recognized positive impacts of large wood associated with stream and river ecosystems. Investigations have documented the merits of woody debris within the aquatic system, both in the channel and along the banks in the riparian zone. Wood has been found to play important roles in the formation and control of channel morphology and shaping of energy flow, for the trapping and storage of eroding sediment in the watershed as well as leaf litter and other aquatic foods, and for its contribution to habitat for aquatic organisms. These observations have expanded

the original perspective that bank and channel wood destructively caused erosion, sediment deposition and obstructed boat and fish passage.

In reality, many of the former and recent observations regarding the physical influences of wood in stream channels are similar. Wood can cause bank erosion and multiple channeling. It can also be an effective sediment trap forming shoals or islands. What varies is the context of the human assessment of the consequences of these influences of wood on these systems.

Streams and rivers, like any part of the landscape, are always in creation, always changing. They are never static (after Maser, 1989). It has been difficult for humans to accept change as a constant feature/process of the landscape and to adapt to it, and the behaviors of streams and rivers have been no exception.

Physical and Biological Functions of Wood

A recent publication by Peter Bisson and others (1987) offers a synopsis of much of what have been found to be the roles of large wood in Pacific Northwest streams and rivers. The authors place these roles in two fundamental categories. The first category involves the physical influences of wood in streams and rivers. The second focuses on the biological functions of wood in streams and rivers. These biological functions can involve either the direct use of the wood by organisms, or the benefits to organisms of the physical influences that the wood has on a channel's structure, the water, sediment and gravel, and other components of the stream or river.

The physical function of wood associated with channels involves the wood's contribution to what is referred to as stream structure and complexity. Substantially sized objects such as large woody debris and boulders in a stream or river (known as structural roughness elements) add form and complexity to a channel. The antithesis of a complex channel would be the concreted San Gabriel River in Southern California which has been altered to function solely as an open pipe (Figure 3.3.2.1).

Wood is responsible for the formation of several types of pools in streams and rivers. A large piece of wood that spans a stream, or is significantly sized in proportion to the channel dimensions, can create a small waterfall or drop. A plunge pool forms immediately below the drop where the falling water scours the channel bed. In addition, gravel and sediment is trapped upriver of the wood. A single piece or clumps of wood can simultaneously cause both scouring and sediment deposition.

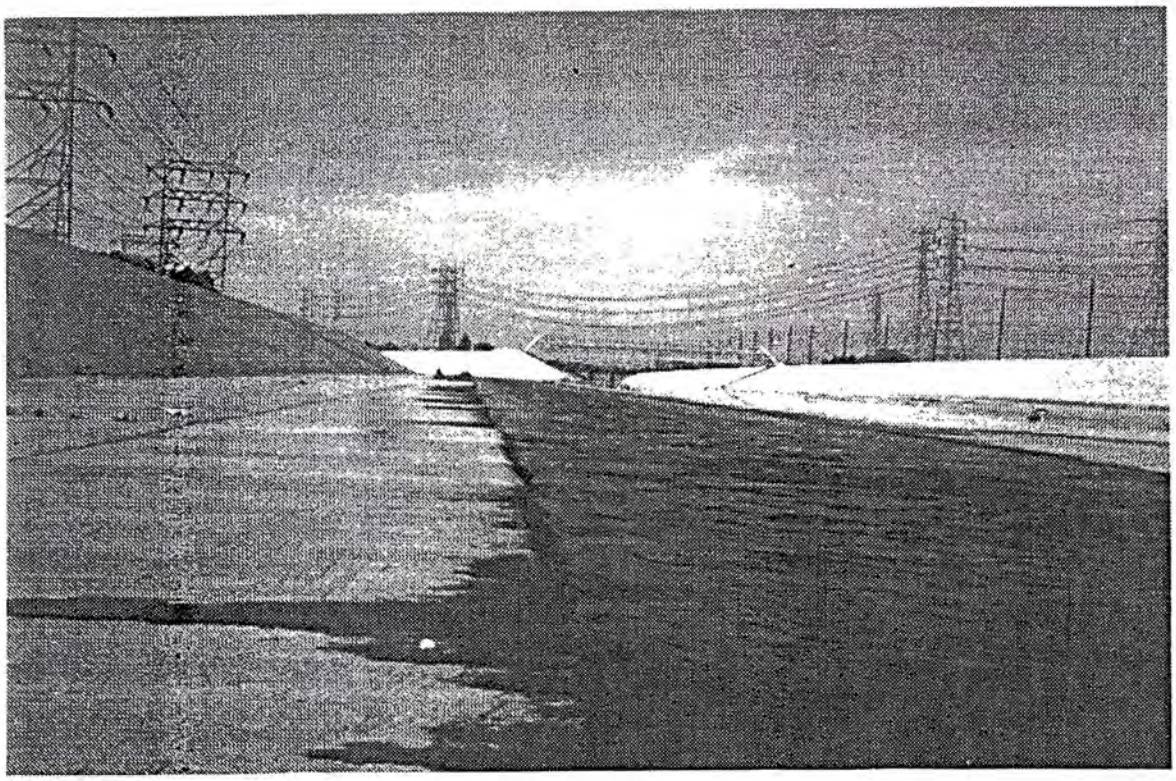


Figure 3.3.2.**1.** The San Gabriel River in California has been straightened and fully concreted. During this process, all forms of structure creating channel habitat complexity have been lost, 1985 (Courtesy of Kelly Moore.)

As water flows around large wood, it also forms scour pools. Scouring action caused by wood can extend to bank erosion as well, and can contribute to additional inputs of wood as bank trees fall into the river. Those trees are usually intact with branches and root wads, and are more likely to remain near their point of entry, especially the ones that swing and rest parallel to the flow along the river bank. In moderate to large sized channels, unless the wood is anchored by some means such as their root wad, it is likely to move on down river during a high water event. It has been documented that after the removal of wood from a number of northwest streams, the number of pools per mile in the stream substantially dropped **(Sedell 1984)**.

Piles of wood can dam a stretch of channel to form a pool upriver of the jam. Jams can also widen the channel and create islands and side channels by diverting the water from the main flow. Side channels increase the amount of available stream edge which increases the connections and interactions between the land and water as well as provide additional preferred habitat for young fish.

Another influence of channel wood is the trapping of sediment and detritus in watershed tributary streams. Sediment that enters these stream channels is captured and stored by stable woody debris and detained from washing down to the lower river. Where wood has been removed from tributary channels, stored channel sediment has been unloaded into the downstream reaches. In addition, many of these sites serve as nutrient regeneration zones for nitrate and phosphate compounds that are in the form usable by aquatic organisms (Sedell and Dahm 1984, Dahm et. al., in press).

The wood itself, and the pools and other physical stream characteristics that are the products of the wood's presence in the channel, provide cover and feeding habitat for fish and other aquatic organisms. Bisson and the other authors (1987) summarized wood's ability to maintain a diversity of physical habitat by, (1) providing the basis for pool structure along the channel, (2) creating backwater areas along the stream and river margins, (3) causing the formation of secondary (side) channel systems in valley floors, and (4) increasing the range of depth of the channel.

Fishermen have consistently searched for the fishing spots in streams with "sweeper" trees, bank brush and other wood, recognizing that fish were closely associated with these structures (Rosenbauer, 1988). In his fishing guide book, Rosenbauer describes a fish's basic needs for food, shelter, oxygen and a proper spawning habitat. Shelter refers not only to protection from predators, but also to refuge spots from flood water currents. Fish favor sites where food is plentiful and the energy expenditure to catch the food is minimal. Shelter includes feeding spots that are within striking distance of food carrying current, but out of the swiftest currents.

Pools offer deeper water, and bank vegetation provides cover, locations where fish are less prone to be seen by predators. Rosenbauer (1988) describes alders and other streamside brush that sprawl along the bank and hanging over the water as providing valuable protection where a fish can live near the bank, where the current is slower, with little fear of predation. Wood lying parallel to the bank creates slower water pockets for fish, including along channel margins of larger rivers where it often forms the most productive fish habitat (Bisson and others, 1987). Rosenbauer (1989) also describes an intact tree with branches, after having toppled over, still often attached to the bank and lying in the water, as a preferred fish feeding site.

Bank situated wood that lies on the land out of the water during periods of moderate and low flows provides calm water refuge spots for fish during periods of flooding while the main channel water is swift and turbulent and water overflows the bank to reach this wood. Interactions such as this between small streams

and rivers and their floodplains are very similar. The habitat becomes more diverse in terms of structure, depths, water velocities, and inputs of nutrients. Wood and the resulting stream morphology act as traps of aquatic foods such as leaf material and detains it from traveling downstream. Aquatic insects and other invertebrates feed on the leaf litter as a step in the food web, and utilize wood-related areas as habitat. The turbulent pattern of water flowing over the debris aerates the water, adding oxygen which is essential to aquatic organisms, and critical for the breakdown of organic waste by microorganisms.

Wood in Tidal Rivers

Few studies have been done to examine the physical and biological functions of wood in tidal sections of rivers and tidal flats. Wood in tidal channels appears to fulfill similar physical and biological requirements including structural cover and feeding habitat for fish (Tom McMahon 1990). While conducting fish research in a northwest river estuary he found juvenile anadromous fish to be clustered around submerged wood. Channel complexity and cover becomes especially important during low tides when river organisms are forced into a much smaller channel area as they temporarily lose the use of some of the tidal marsh channels and other bottomland areas. Even docks and old remnant pilings are used as cover by fish.

Wood that is deposited in marshlands, tidal flats and other periodically flooded areas enhances structural complexity of these areas as well. Wood that rests in tidal marshes for a period of time creates a local sediment deposition site around the wood, and if the wood is later shifted from its position, a depression pocket remains.

Tidal channels through grass marshes benefit from wood structure. Unlike a bouldered and shrub-lined stream, grass marsh channels often have less cover than brushy and tree-canopied areas.

Larger wood probably influences the shaping of tidal channel morphology in ways somewhat similar to upriver areas. Sediment deposition and scouring in tidal areas resulting from the presence of large wood and structures such as pilings occur primarily during flood events. In addition, woody vegetation growing on the river bottomlands slow floodwater velocities and deposit suspended sediment on the land.

Stream and river management on the Coquille historically was targeted to accomplish a few objectives that included transportation, agricultural use of the bottomlands, and later flooding and erosion control. Human influence on the landscape in some cases made this management more difficult because of such consequences as abnormal sedimentation and habitat loss. The

consequences as abnormal sedimentation and habitat loss. The most significant difficulties, however, were experienced in striving to modify typical river behavior and features. Some of the consequences included damage to other river resources. From a broader perspective evaluation, it is expensive, both in dollars spent and negative impacts on associated economic resources, to attempt to engineer and constrain rivers to function in a manner not typical of aboriginal fluvial systems.

3.3.3 Channel Depth and Dredging History of the Tidal Section of the Coquille River

The abundance of historical descriptive information and numerical data lends strong credibility to the hypothesis that the Coquille River tidal channel water depth has decreased since the time of Euro-American settlement of the Coquille area. There probably has been no single cause of this change in the tidal Coquille, although human intervention in the landscape has likely played a major role in the process. Channel water depth can be influenced by a variety of factors, including the volume of the flow, channel width, channel filling, and the ability of the flood waters to scour and transport material. As water velocity slows as a river enters a tidal area, its ability to transport suspended materials is significantly reduced.

Information Sources

This historical channel depth summary on the Coquille River has been reconstructed using archival dredging records from the U.S. Army Corps of Engineers and the Ports of Coquille and Bandon, in combination with boat traffic accounts and descriptive records from sources including original land survey notes. There are also a number of historical channel depth data maps produced by the Corps of Engineers, the Port of Coquille, the Port of Bandon (Appendix 7), and applicants for boom permits or other river related uses. These channel depth data were collected by varying methods, including cross-channel, thalweg and diagonal measurements, so that comparisons of depth over time become more complex. The dredging activity has further complicated a comparison of depths over time, so these data were only used to verify reports of chronic and increasingly greater channel depth loss. What is apparent from the historical record is that channel depth restoration through dredging often disappeared after a few years. Some sections of river were chronically prone to shoaling.

Early Surveyors' Comments

A number of statements describing the Coquille channel were made by the original land surveyors. The early reports of the appearance of the channel upriver of Coquille City did not match the late 1800s descriptions of the river.

From August through October of 1858, Sewell Truax surveyed the river bottomlands from the Coquille City area upriver to Norway at river mile 35. He described the channel as,

"...a deep still stream navigable at all seasons."

In August of 1858 Truax also surveyed the river bottomlands from Arago upriver to Norway. He noted that,

> **"the Coquille River is navigable at low water. The banks are from ten to twenty feet high..."**

And in a similar account a little later in the report he noted that,

> **"the Coquille River is navigable at all seasons of the year..."**

Sewell Truax also surveyed the upriver valley bottomland which included the section of river from Norway up to Myrtle Point and to the Middle Fork. He completed the work by the end of October, 1858. Although he unfortunately did not go into much detail when he described the land, especially concerning seasonal navigability of the river, he did have the opportunity to observe the river at the end of the dry season. In his "General Description" he wrote the following:

> **"The Coquille River runs through the township [T29S R12W] in a northernly direction. The principal fork [North Fork] enters the same in section nine. This fork is navigable for small steam boats. Tide water extends above the surveys several miles. The Coquille River is also navigable for small steam boats. The Middle fork [is] rapid and not navigable."**

These accounts from the Original Land Surveys support the U.S. Army Corps of Engineers navigability reports of fairly deep and reliable channels during the early years of boat traffic, at least to the North Fork confluence, and probably up to the Myrtle Point site.

Head of Tide

Truax's survey notes also made specific references to head of tidewater. When he surveyed the river valley section of Township 29 South, Range 12 West between August and October of 1858, Truax ran the line between sections 3 and 4 which crossed the North Fork at about mile 1.2:

> **"Tide water on the north fork of the Coquille extends a few miles above this line."**

This would have put the 1858 tide head of tide water on the North Fork in the vicinity of Cooper Bridge at about river mile 4 during late summer flows, or about 41 miles above ocean mouth.

The present head of tide on the Coquille is reported to be approximately 37 miles from the river mouth. According to Truax and other accounts, tidal influence at the time of settlement of the valley in the mid-1850s was several miles farther upriver, and traveled up to the junction of the South and Middle Forks of the Coquille, 41 river miles from the ocean. The tidal segment of the lower Coquille provided a reliable, canal-like means for boats to travel up and down the valley.

Dredging in the Tidal Coquille

The U.S. Army Corps of Engineers became committed to the improvement and maintenance of the Coquille River for boat travel by 1881 when the agency launched the first of its Coquille River mouth jetty projects. A lucrative San Francisco market welcomed a wide variety of agricultural and wood products and lumber from the Coquille area. The first leg of the journey to market for the majority of these items was down the river. Intra-valley commerce and human travel heavily relied on river transportation as well.

The Corps related in their 1878 Annual Report, probably after conversations with local residents, that the Coquille River formerly had,

> **"features of a natural canal...its channels free from rocks, shoals or rapids and obstructed by a few snags."**

Light draft craft, or steamers, could travel to Myrtle Point, and large coasters 10 feet in draft could travel at low water up to Coquille City. In an 1890 Corps of Engineers report by Mr. Littlefield, residents were quoted attesting to the channel's original navigational state:

> **"Hon. Binger Hermann and Captain Rackcleff, old-time residents, inform me that '30 years ago' there was 4 feet at low water from the 'forks to Myrtle Point;'..."**

The "forks" referred to the point where the North Fork and South Fork joined to form what is known as the main Coquille River.

Figure 3.3.3.1. **Coquille River Depth & Dredging Summary 1878 - 1930**

Fold-out summary on accompanying page

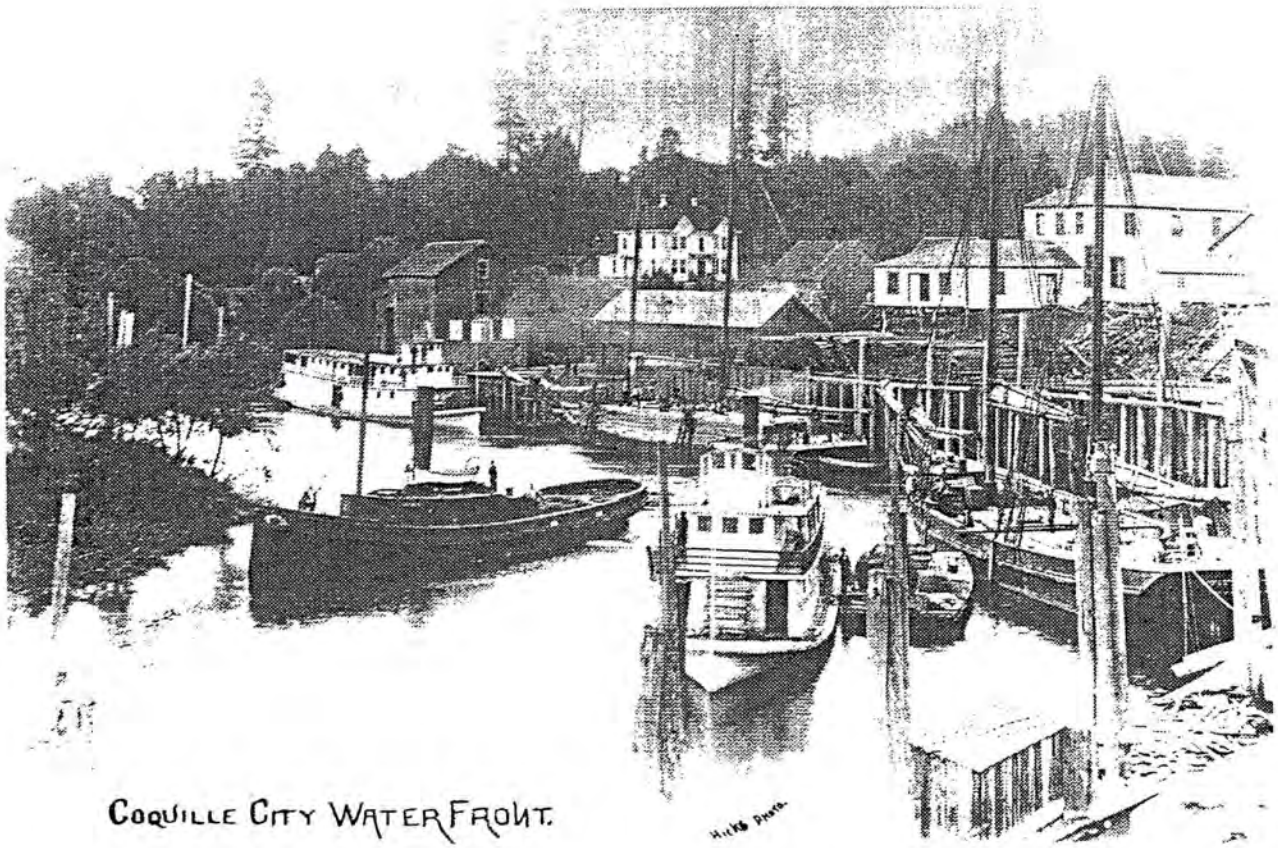


Figure 3.3.3.**2.** River travel & boat traffic was the standard method of transporting goods and people on the Coquille River in 1890 (Courtesy Douglas County Museum, File # 2598).

It should be noted, however, that if local interests had felt the necessity for federal agency funds to be applied to the Coquille, the accounts of the channel's former navigable state could have been slightly idealistic or exaggerated. But, regardless of some possibly subjective accounts of the former depths, the upriver section of the tidal channel appears to have begun to develop shoals by 1886. The 1887 Army Corps of Engineers annual report commented:

> **"The steamers experience difficulty at the low water stages of summer & early fall; on account of snags & sunken drift & shoaling caused by the latter; at times the steamers end their route a mile below Myrtle Point. Formerly the river was good, and I am told that steamers have ascended to the head of tide above Myrtle Point; and that a coaster has landed at Norway...the decay of the channel results largely from logging & land clearing."**

The Corps performed their first Coquille River work above the mouth in 1889. They removed wood snags and scraped bars that had formed in the channel. The next year the bars had returned and several new shoals had formed. An 1891 survey reported a total of six shoals. All of these initial channel problems were restricted to the upper portion of the tidal river above Roberts Landing.

In 1892 the river between Myrtle Point and Coquille was snagged, and a wing dam was constructed at Roberts Island in an attempt to direct the water to one side of the island.

The report for 1892 commented on the ongoing deterioration of the channel.

> **"It was found, however, that since the survey...made in 1891 a heavy deposit has been made in the upper portion of the stretch between Myrtle Point and Coquille City [above Norway]. At the time of the survey there were deep pools between the bars, which the latter in some instances were dry, as far as navigation was concerned, at low water stage. These pools have to a great extent filled up with alluvial deposit since the survey was made, so that as to regards of results obtained, it may be stated that while snagging...has been beneficial, nature has been at work filling up the river, so that its navigable capacity has not increased."**

In 1893 it was reported that,

> **"The main river between Coquille City and Myrtle Point is being rapidly filled up with sediment, snags, etc, so that an estimate made years ago for its improvement to give 4 feet of water is not indicative of what the improvement will cost now."**

In 1894 another survey of the river above Coquille was conducted by David B. Ogden, and it was found that a seventh shoal had formed a few miles downriver of the previously lowest shoal. It was in an area that was to be known as "Nancy's Pinch." He put together two detailed maps of the river showing these navigational obstructions (Figures 3.3.3.3 and 3.3.3.4).

It is worth noting that at this time the river below Arago was free of shoals and, other than some snags, was reported to be free of navigational hazards. The lower portion of the tidal river other than the mouth did not present a navigational problem.

Wing dams, pile dikes and shore protection were constructed along the upper tidal Coquille in the 1890s in addition to the snagging and dredging work, especially between Rackleffs Landing and

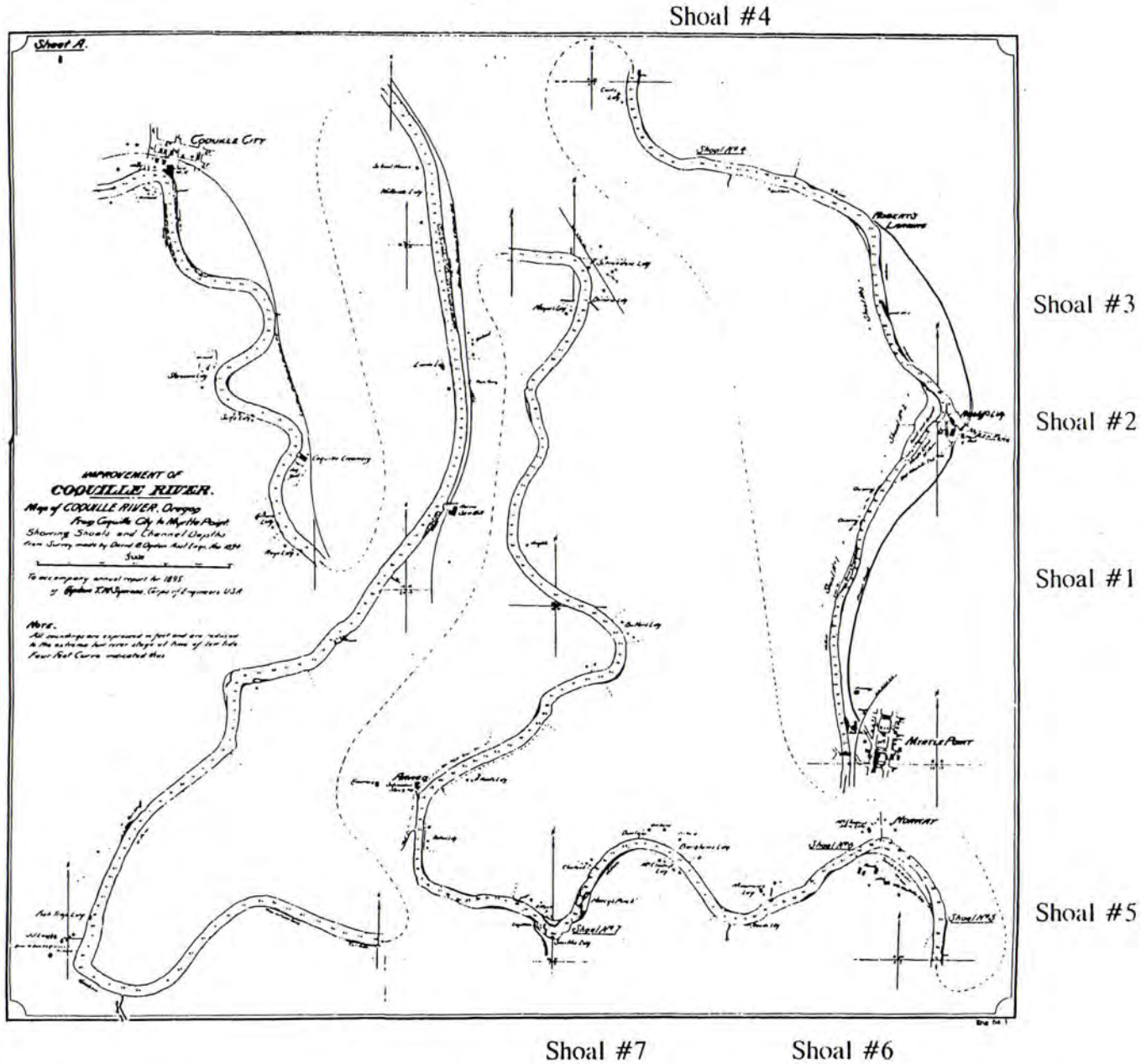


Figure 3.3.3.3. U.S. Army Corps of Engineers map of the Coquille survey from Coquille City to Myrtle Point showing shoals and channel depths, November, 1894.

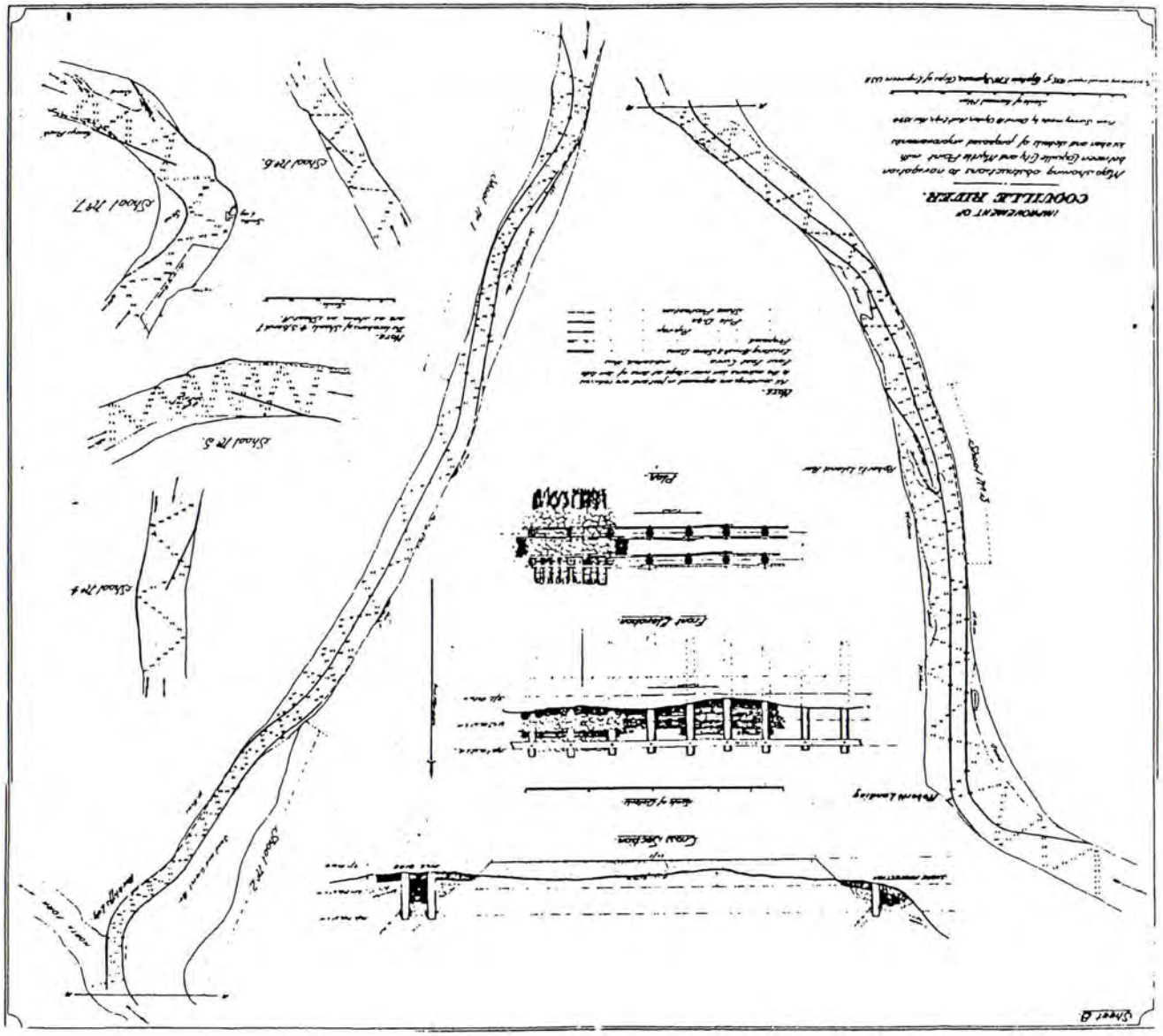


Figure 3.3.3.4. U.S. Army Corps of Engineers map showing obstructions to navigation from Coquille City to Myrtle Point in 1894, with locations of proposed improvements.

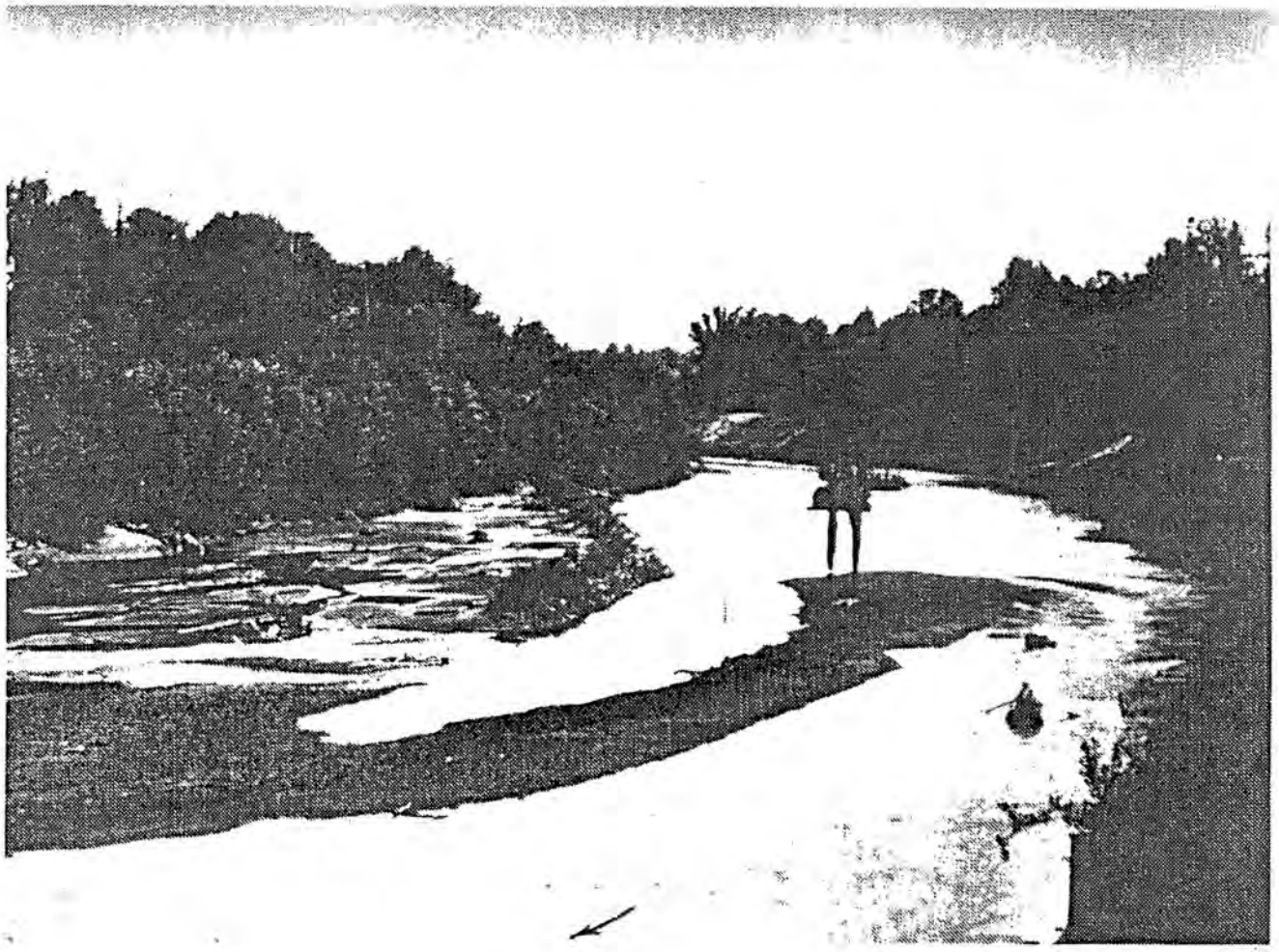


Figure 3.3.3.**5.** Looking upstream from Shoal # 3 on the Coquille River between Rackleff and Roberts Landings prior to 1897 pile wall construction and dredging. "Shows the small volume of the stream at low water." (U.S. Army Corps of Engineers Annual Report to Congress, 1899-1900).

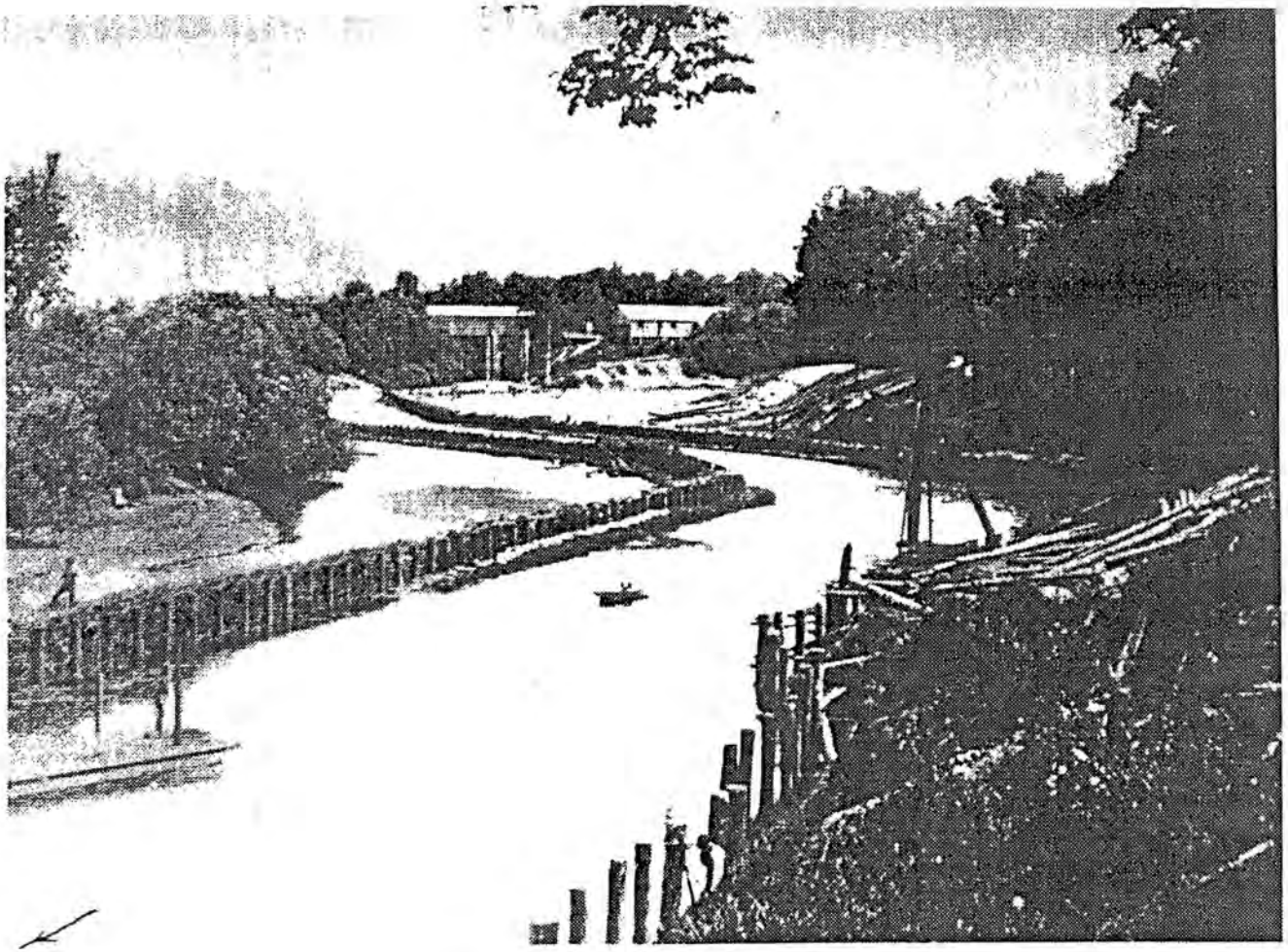


Figure 3.3.3.**6.** Same river section as in Figure 5, "Shows the manner in which in 1897 the [Coquille River] channel was confined between two rows of pile dikes 60 feet apart, [and dredged] in the 5/8 mile from Roberts Landing to Rackleffs Landing," (U.S Army Corps of Engineers Annual Report to Congress, 1899-1900).

Roberts Landing. In 1892 a wing dam was built at Roberts Island Bar to direct the water into the main channel. In 1896 the Corps contracted with Noble and Saunders to do extensive channel rehabilitation in the upper river. During the summer and fall of 1897, the company spent 37 days removing snags from the river. They also dredged 2,402 cubic yards of shoal material from the 5/8 mile stretch between Roberts Landing on the Coquille and Rackleffs Landing to form a 50 feet wide and 4 feet deep channel. They constructed 2,200 linear feet of pile, brush and lumber dikes. These dikes narrowed the channel to concentrate the flow in the hope that it would scour and maintain depth, and provided shore protection along the 5/8 mile of river between Roberts and Rackleff Landings (Figures 3.3.3.5 and 3.3.3.6).

The photographs in Figures 3.3.3.5 and 3.3.3.6 were taken of this stretch of river before and after the pile dikes were built to constrict the channel. The first photograph also shows a wing dam built in 1892. This section of river was also dredged to a four foot depth at this time.

Limited funds confined the dredging work to the section of river below the North Fork confluence, though the last stretch of river to Myrtle Point was also very shallow. The results of the river work, however, were temporary:

> **"At the close of operations on October 12, 1897, the river steamers experienced no difficulty in running upstream as far as Roberts Landing. Small bars have since formed, however, which prevent the steamers from navigating the stream above Norway, 3 miles below Myrtle Point, excepting when the stage of water is high."**

In 1899 the last major snagging and dredging effort was begun by the Corps on the upper river to restore the channel. It is worth noting that another new shoal had formed by this time downriver of Shoal #7. Table 3.3.3.1 summarizes the dredging efforts. Over 29,400 cubic yards of material were dredged from almost a mile of channel segments to produce a 50 feet wide and 4 feet deep channel. No work was done on the South Fork up to Myrtle Point, even though it was very shallow, because of operation fund limitations.

By June of 1902 the Corps reported that this recently restored channel to a four-foot depth had shoaled again so that the maximum boat draft had degraded to two feet in some spots. It was noted that,

> **"...the conditions have changed since the adoption of the present project for improvement [to maintain a 4 feet deep, navigable channel], and that a revision of the present project appears to be advisable."**

Table 3.3.3.1. Summary of the U.S. Army Corps of Engineers Dredging Operations to 4 ft. low water depth between Rackleffs Landing at the North Fork confluence and Arago.

Location	Dredged Distance	Amount (cu.yds.)	Width
Shoal below Shoal #7	750 ft.	1,766	50 ft.
Shoal # 7	330 ft.	1,510	50 ft.
Shoal # 6	840 ft.	3,268	50 ft.
Shoal # 5	440 ft.	3,340	60 ft.
Betw. Shoals # 4 & 5	1,370 ft.	3,206	50 ft.
Betw. Shoals # 3 & 4	1,300 ft.	5,068	50 ft.
(was dredged to 36 ft wide in June)			
Shoal # 3	600 ft.	2,976	50 ft.
TOTAL:	**5,210 ft.**	**29,489 cubic yards**	

The U.S. Army Corps of Engineers reported that, "The material dredged from the above named shoals consisted of sand and fine gravel, except at Shoal# 3, where coarse gravel & clay were encountered."

The Corps had observed the year before that maintaining a navigable channel in the upper tidal river did not appear to be economically feasible:

> **"It appears that the bed of the stream is being filled up each year in the 3 or 4 miles immediately below Myrtle Point by sediment brought down during freshets, and it is considered impracticable to obtain and maintain the projected channel...at mean low water throughout the distance of 13 miles between Coquille and Myrtle Point except at an expense not warranted by the limited amount of commerce of that region."**

In 1902 the U.S. Army Corps abandoned the project to maintain a navigable channel on the upper river above Coquille City with the exception of some sporadic snagging work.

The Tidal Coquille Below Coquille City

Throughout the fifteen year period between 1886 and 1902, the U.S. Army Corps of Engineers labored to maintain a navigable channel upriver of Coquille City as shoals rapidly increased in number and reformed after being dredged. The river section downriver of Coquille City was free of shoals during this period. In both 1892 and 1894, the Corps Annual Report stated that,

> **"This portion of the river at times has been more or less obstructed by snags, but no serious shoals have formed."**

In 1899 and then in 1902, the year that the Corps abandoned its work on the upper portion of the tidal Coquille, the lower river appeared to remain free of navigational obstructions. It should be noted, though, that for the first time high tide was mentioned as a factor for deep draft boat travel:

> **"Once safely across the bar at the mouth of the river, vessels experience no special difficulty in ascending the stream at high tide to the town of Coquille, about 25 miles above Bandon."**

This was one of the last years that a positive comment was made by the Corps of Engineers in their annual reports to Congress regarding the navigability of the river below Coquille. The next year two shoals were reported to have formed:

> **"A shoal has formed in the river channel immediately above Bandon to such an extent that navigation is seriously impeded thereby, loaded vessels being frequently delayed twenty-four hours, and compelling lighterage in many instances. Another shoal in the river channel in the vicinity of Parkersburg, about 7 miles above Bandon, causes considerable delay to river commerce."**

In 1904 a third shoal had developed, near Randolph Island:

> **"There is...a shoal just above the Government wharf, near Bandon, and two other similar shoals - one above Randolph and one near Parkersburg - each with a depth of about 5 feet at low water. These shoals caused more trouble to vessels than the ocean bar."**

Money was appropriated by the 1910 River and Harbor Act to restore the river's depth. By then six shoals were impeding river vessel traffic in the lower river (Table 3.3.3.2). In the summer of 1911, 130,020 cubic yards of material were dredged from these shoals to restore the channel to about a 10-foot depth and a width of 80 to 100 feet.

Table 3.3.3.2. Shoals below Coquille City in 1909.

Shoal	Controlling depth
Strangs	4 feet
Parkersburg	5 feet
Walstroms	6 feet
Randolph	6 feet
Randolph Mill	9 feet
Bandon Shoal	? feet

Table 3.3.3.3. Dredging Summary, 1912 - 1924 for M.L.L.W.

Year	Shoal	Amount Dredged	Depth	Width
1912	Bandon	13,392 cu.yd.	10 ft.	40 ft.
1913	Bandon	23,675 cu.yd.	10 ft.	80 ft.
1913	Strangs	5,332 cu.yd.	9 ft.	100 ft.
1916	Strangs	6,323 cu.yd.	9 ft.	100 ft.
1917	Strangs	4,444 cu.yd.	9 ft.	100 ft.
1920	Randolph	89,183 cu.yd.	10 ft.	100 ft.
1923	Bandon	93,324 cu.yd.	10 ft.	80 ft.
1924	Bandon, Parkersburg, & Strangs	107,435 cu.yd.		

TOTAL Dredged: 336,785 cubic yards from shoals located in a 23 mile river section

Over the next thirteen years the Corps reported removing 343,108 cubic yards of sand from the areas of the six shoals (Table 3.3.3.3). In addition to the Corps work, the newly formed Port of Bandon spent $43,842 in 1915 "to restore and deepen the existing channels." The explanation given for these new, but chronic, channel depth problems at these river sites was summarized by a 1913 annual report statement:

- **"During the rainy season heavy freshets occur in the river, which overflows the bottom land and brings down deposits of silt and gravel."**

The summer of 1924 was the last year that the U.S. Army Corps dredged the river above the river mouth area at Bandon during the period of record to 1948. During the fifteen-year period that

the Corps maintained the channel between Bandon and Coquille, the Corps and the Port of Bandon dredged at least 500,000 cubic yards of material. The 1935 River and Harbor Act required that "local interests assume the entire expense of providing and maintaining an adequate channel in the river above the eastern end of the North Jetty."

As early as 1926 there was evidence of the reappearance of shoals. In 1928 soundings were taken that documented the further loss of channel depth below Coquille:

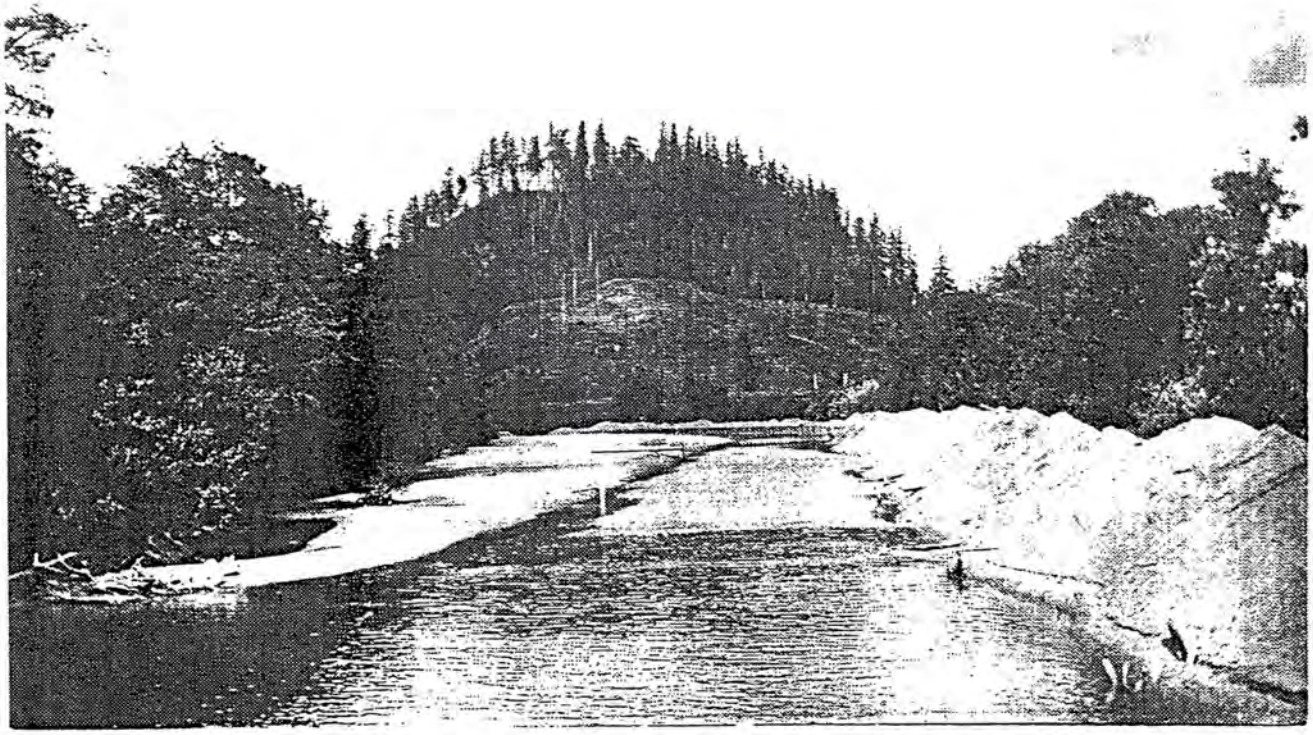
> **"Soundings taken at Bandon Shoal show a controlling depth of 8 feet to Prosper, 5 miles above the entrance. No surveys have been made above Bandon Shoal for a number of years, but it is reported that the channel has shoaled to 6 1/2 feet from Prosper to Coquille, 25 miles above the entrance."**

In 1939 the controlling depth to Coquille at "mean lower low water" was reported by the Corps to have deteriorated to 6 feet. By this time, however, other modes of transportation had replaced river shipping.

Port of Coquille Dredging Efforts to Maintain a Navigable Channel 4 Feet Deep & 50-60 Feet Wide 1916 - 1923

One of the purposes of the Port of Coquille was to maintain the main Coquille channel above Fishtrap Landing at about river mile 29, and the South Fork below Myrtle Point, for navigational purposes. They inherited an ongoing struggle with channel sedimentation from the U.S. Army Corps of Engineers, when the Corps retired from the job of river channel maintenance above the city of Coquille in 1902.

In its effort to keep this stretch of the river channel navigable, the Port removed over 356,000 cubic yards of sand and other bottom material over an eleven-year period. Figures 3.3.3.7 and 3.3.3.8 show a dredging project in about 1916 using a government scow loaned to the Port. Their dredging efforts are summarized in Table 3.3.3.4. The longitudinal profile of the Coquille from Myrtle Point to below Roberts Landing portrays the shallow nature of the channel in 1915 (Figure 3.3.3.9). The Port may have continued periodic dredging of the river below Myrtle Point after this date even though the available Port record information ends in 1923.



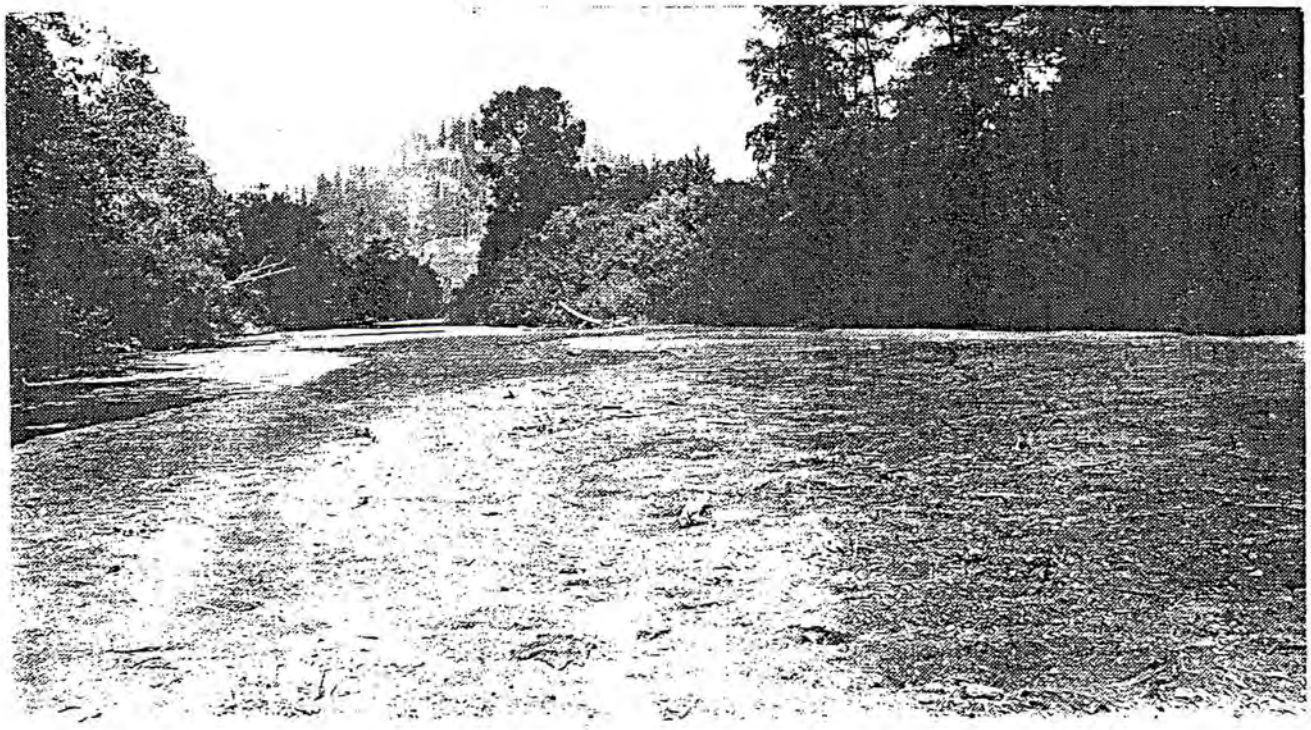


Figure 3.3.3.7 **(a) & (b).** Photographs of the South Fork near the North Fork confluence, ca. 1916. The first photograph shows the channel prior to dredging by the Port, and the second the channel during the dredging process (Courtesy of the Port of Coquille).

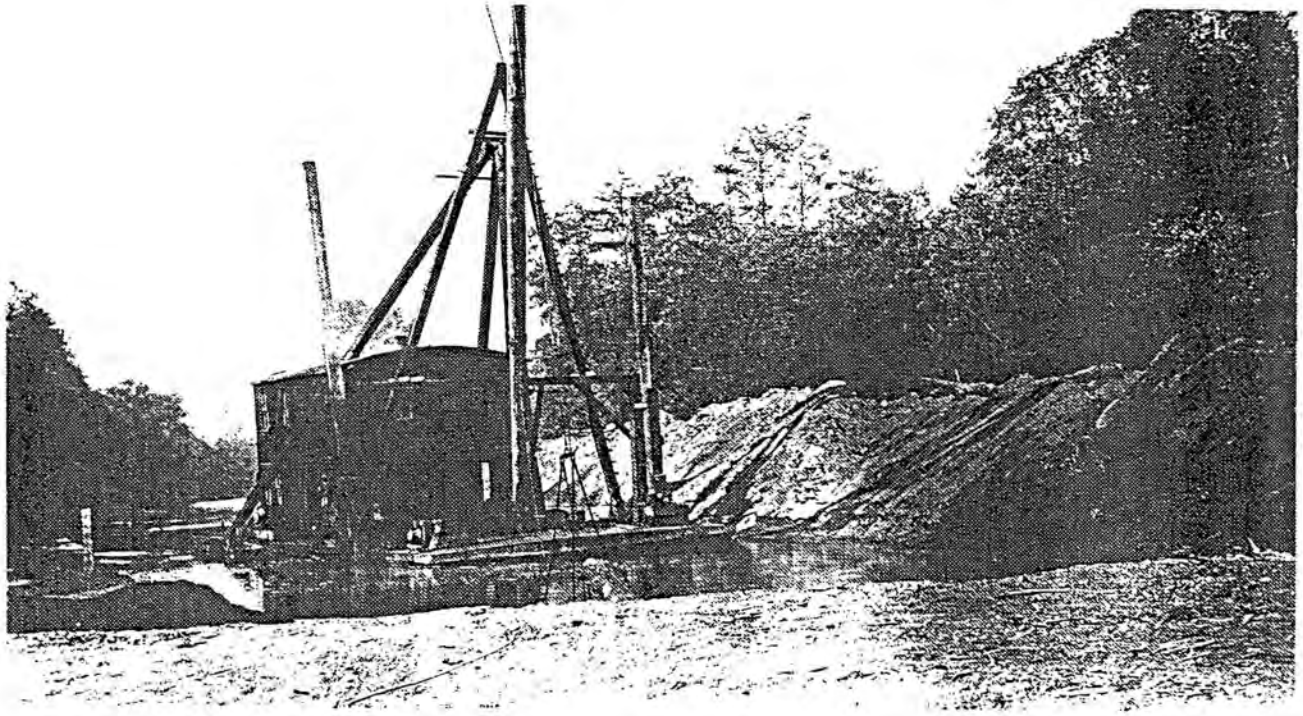


Figure 3.3.3.**8. (a) & (b).** These two photographs together form a wide angle view of the dredge scow & work on the South Fork of the Coquille in about 1916 (Courtesy of the Port of Coquille).

Table 3.3.3.4. Port of Coquille Dredging Data between Myrtle Point and Fishtrap Landing on the Coquille River.

Fiscal Year	Dredged: cubic yds. Sand	Clay	Distance (in feet)
1913 - 1914	(dredged & snagged - $1,647)		
1915 - 1916	23,143	450	4,058
1916 - 1917	121,144	-	16,936
1917 - 1918	8,703	-	1,575
1918 - 1919	32,637	-	3,110
1919 - 1920	54,148	-	4,995
1920 - 1921	35,039	-	6,274
1921 - 1922	8,014	-	8,014
1922 - 1923	29,109	-	7,380

Total Amount of Material Dredged: 356,048+ cubic yards
Equivalent River Channel distance: 52,342 feet = 9.91 miles

The dredging record of the tidal section of the Coquille clearly documents a progressive deterioration of the water's depth in the tidal channel after settlement of the area. These changes were progressive. Shoals initially formed upriver near the head of tide, then over about a 30-year period gradually developed farther and farther downriver towards the mouth. Repeated dredging only temporarily restored channel depth in the shoaling stretches. It is also apparent that the head of tide has moved downriver since the 1850s.

Floods and Related Historical Events

There were several large Coquille floods in the late 1800s. The effects of these floods, such as loss of homes and livestock, definitely made a large impression on the settlers. The first flood was in 1861, the second in 1881, and the last in 1890. George Bennett, an early resident of the area, gave brief accounts of the early storms in a 1927 paper titled, "A History of Bandon and the Coquille." The 1861 flood was responsible for relocating the Coquille River mouth. The 1890 storm and the generally persistent rainfall during that period probably triggered a large landslide that occurred on lands near a

Longitudinal Profile of the Coquille Channel

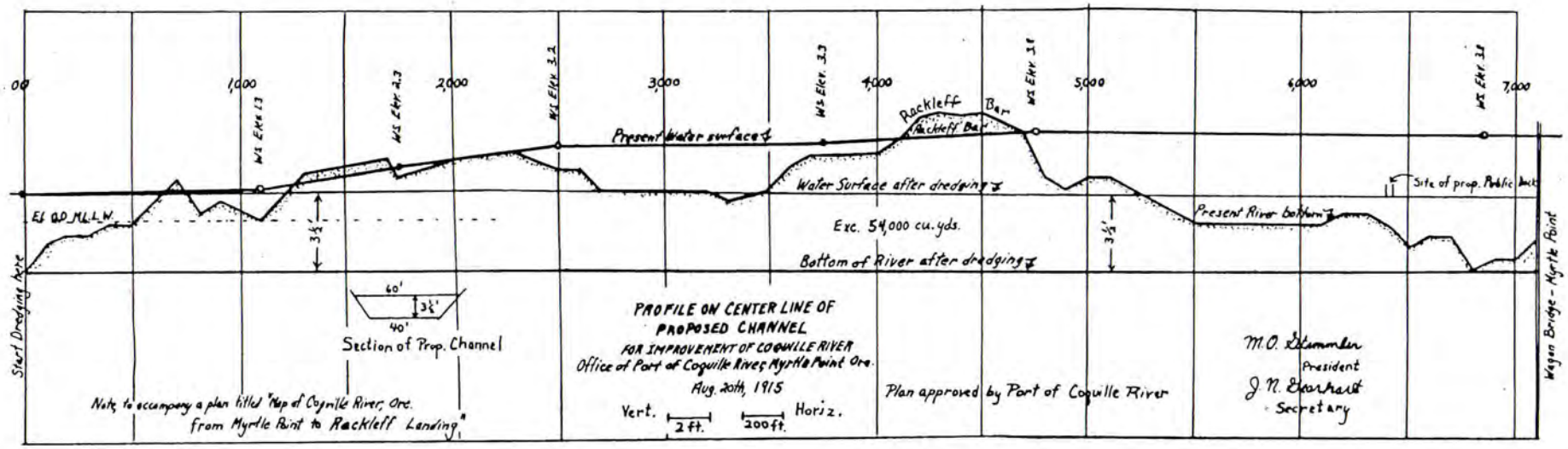


Figure 3.3.3.9. The longitudinal profile of the Coquille channel from Myrtle Point to about the North Fork confluence portrays the shallow nature of the channel in 1915 (Courtesy of the Port of Coquille).

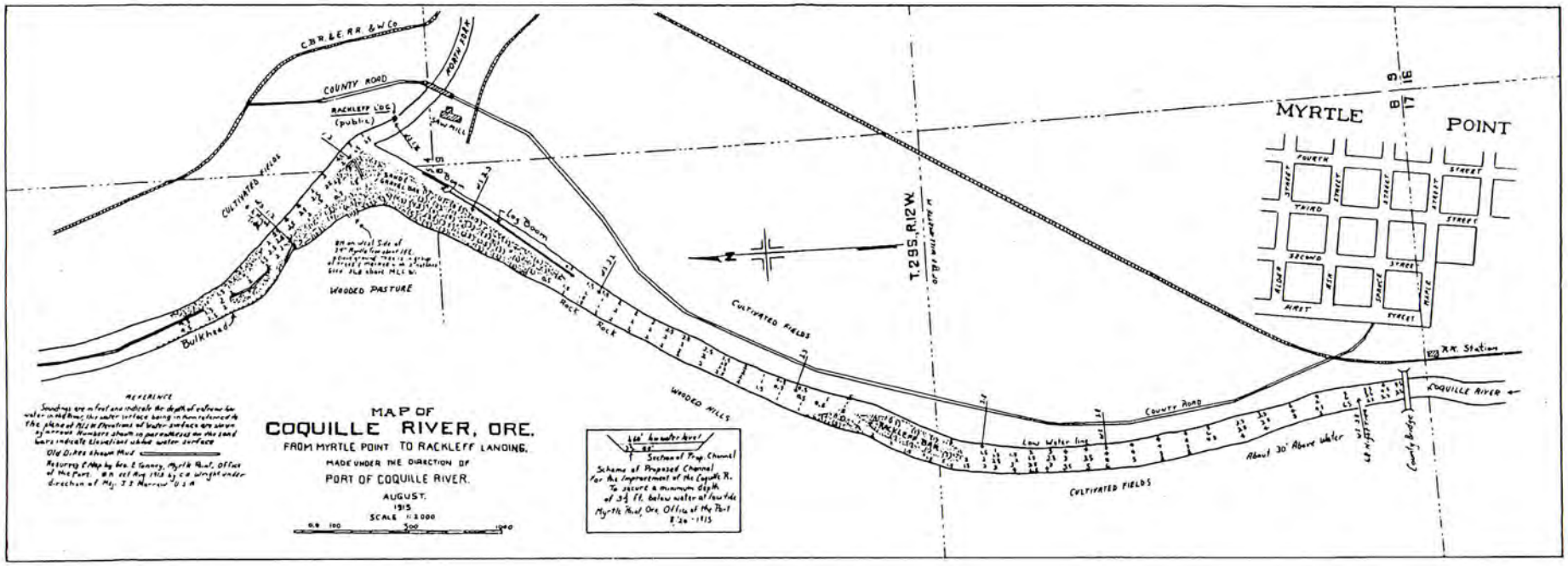


Figure 3.3.3.10. The same section of river as the longitudinal profile in previous Figure 3.3.3.9 (Courtesy of the Port of Coquille).

tributary to the South Fork. The U.S. Army Corps of Engineers Annual Report contained an account of the event:

> **"Even now the waters of the upper river are not clear [June, 1890], owing to vast land-slides on the forks. On February 4th I paced on bank of the river, just above Coquille City mill boom, along the raft of trees filling the stream from bank to bank a distance of one-half mile. The raft was wedged, and of thickness varying from 2 feet to nearly the channel depths...The timber was mainly green fir and cedar, from a mountain land-slide on south fork of the river, above navigation."**

Orvil Dodge, in his book Pioneer History of Coos and Curry Counties, gave a similarly impressive account of the event:

> **"A wonderful slide took place in 1890, when the side of a mountain literally broke lose and went down several hundred feet with its massive trees and rocks and built a dam across Salmon Creek seventy-five feet high, forming what has since been known as Salmon Lake in a narrow valley above, but within a few days the dam gave way and the timber, debris and mass of earth that formed the dam was swept down the stream and where the junction was made with the main river it raised the stream twenty-five feet almost in the twinkling of an eye...and trees two or three hundred feet long were so thick for a mile up and down the river that one could have easily crossed the stream easily at any point on the drift wood. At Myrtle Point the large bridge came near being torn out and it was said that one could have walked on the timber in the river from the town to Rackleff's mill. The massive pile of timber was stopped at Coquille City by J. Lyons boom..."**

Several shoals appeared on the South Fork below Myrtle Point and on the main Coquille River above Norway after this event, quite possibly formed in part as a product of this slide. The repeated shoaling of the river after this year, however, cannot be matched with other single catastrophic events.

River clearing of navigational obstructions such as downed wood from the river fork channels and their tributaries was probably another early source of sediment inputs. The sediment that had been trapped and detained in the watershed streams by channel wood would have been released to move on downstream by such channel clearing.

Early logging activities were often closely associated with lands adjacent to the river and its tributaries, since the logs were

Figure 3.3.3.**11.** Early logging activities in the Coquille River basin exposed soils (Courtesy of the Bandon Historical Society).

Figure 3.3.3.**12.** Early logging activities in a probable seasonal drainageway in Coos County increased opportunities for sediment to enter the Coquille River, ca. 1915 (Courtesy of the Bandon Historical Society).

transported by water to the downriver mills. Soil disturbance through logging, as well as riparian and land clearing for farming would have both contributed to sediment sources.

The surveyor John Meldrum commented on the North Fork of the Coquille during a June, 1867, survey that,

> **"The River is used for rafting Lumber and running small boats..."**

As mentioned in the beginning of this section, channel width would have influenced channel water depth. A sediment-filled channel could also have altered flood hydrology, and caused bank erosion which in turn would have widened the channel. The Original Land Survey Notes were a source of information for historical widths, and these widths are listed in Appendix 6.

In some instances, the original surveyors noted the distance across the channel, and then the distance between the meander posts at that location. The meander posts were survey markers placed along the river near the bank, but probably not right at the bank's edge. Often, however, an identical number was recorded for both measurements, giving questionable credibility to the accuracy of the channel width measurement. For this reason, and also because of the time and cost of relocating the survey positions where the original measurements were taken, a comparison between the historical and current channel widths for this work was postponed.

One possibility that has not been researched is that the tidal portion of the Coquille River had begun filling prior to Euro-American settlement in the area in the 1850s. Core sampling or the collection of biological or geological data that pre-date the historical settlement records would be of value to determine conclusively if the channel water depth changes in this era are primarily a post-Euro-American settlement phenomenon.

Figure 3.3.3.**13.** Log transportation to a Coquille Fork for log driving down the river, ca. 1890s (Courtesy of the Bandon Historical Society).

3.3.4 Splash Dams and Channel Maintenance on the Coquille River above Myrtle Point

The Forks of the Coquille and their tributaries, for many years prior to the construction of forest roads, were the only attractive options for logging companies for the transportation of logs downriver to the mills or to regional railroads and main transportation routes. The Smith and Powers Logging Company was the exception in the Coquille watershed when they chose to build railroads to transport their cut timber, but other logging companies preferred less expensive options for the transport of their logs.

The transport of logs down the tributaries was an activity that could only occur in the winter season during high flow events. "Freshets," as they were called, were the naturally occurring river floods that historically had transported downed trees and brush that had fallen into tributary channels or had rested on streamside lands, to the lower river. These winter flood waters were enlisted to transport logs. Naturally, however, there were problems associated with relying on nature's high water events, including problems with channel pile-up jams, and the inability to select the day and frequency of such flows.

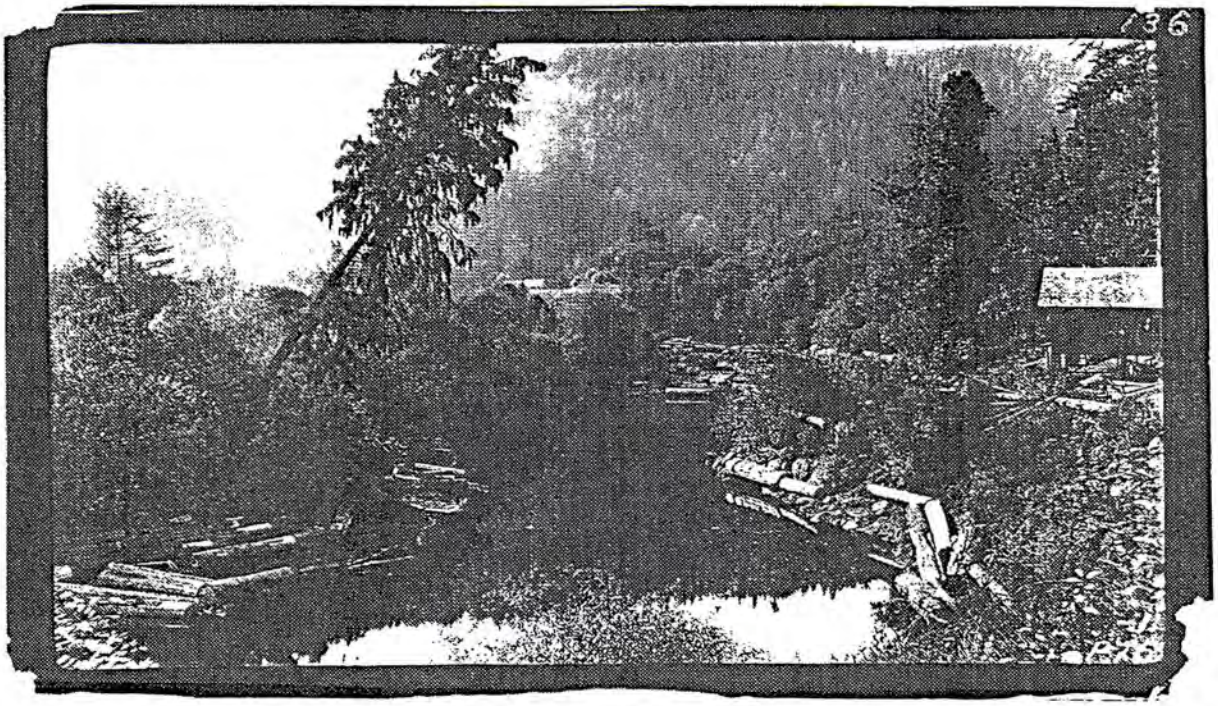


Figure 3.3.4.**1.** The Middle Fork in 1929 with straggler logs left on the banks after a splash dam release, and a stray bank "leaner tree." Prior to settlement, the banks were timbered with many large trees (Courtesy of the Port of Coquille, photo. #76).

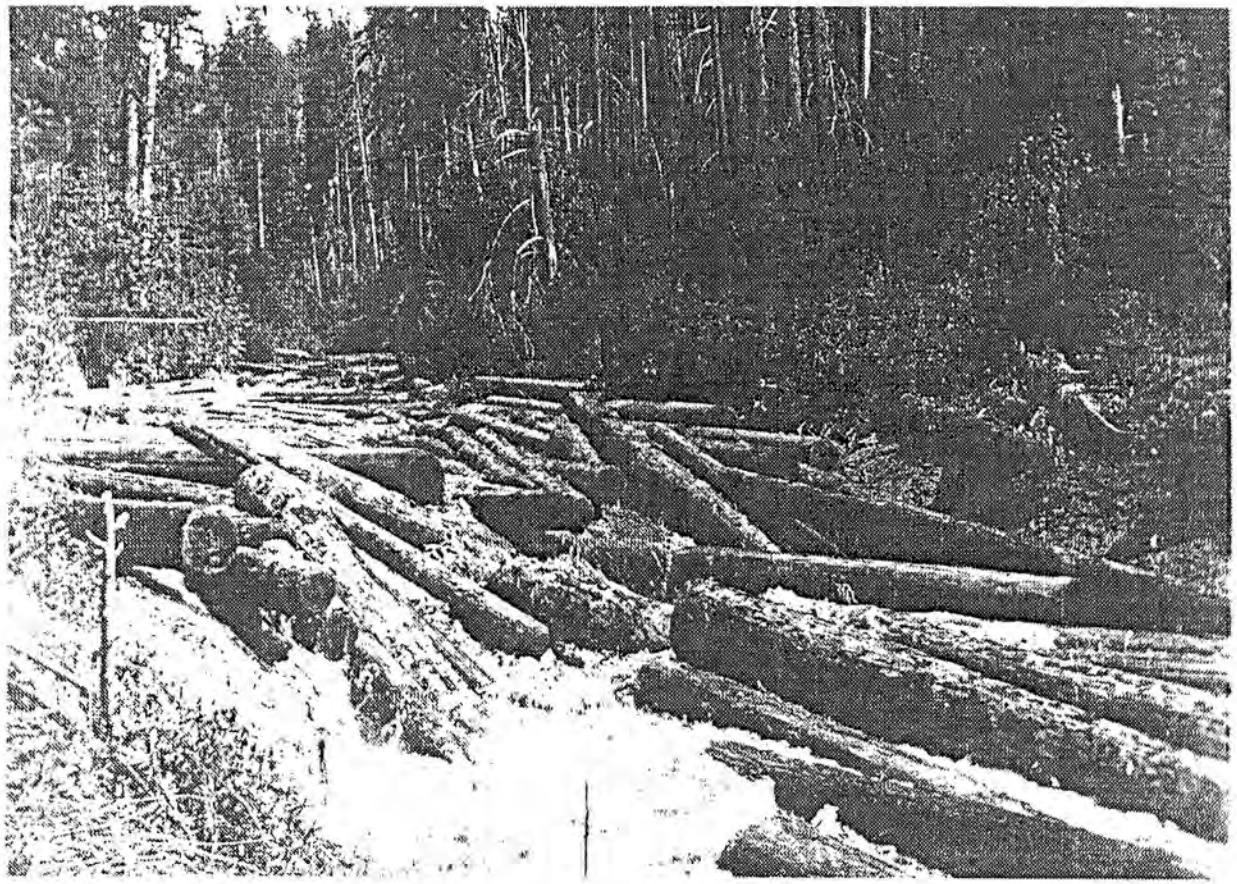


Figure 3.3.4.2. Log drive in the Coquille Basin, circa, 1920s (Courtesy of the Douglas County Museum, George Hinsdale, W. Cappious photo., File # 6591).

Figure 3.3.4.3. Early logging activity, bringing the logs down to the streams with oxen, probably in the Coquille basin (Courtesy of the Bandon Historical Society).

Coquille River Splash Dams : 1905 - 1925

Twenty-five Dams & Their Approximate Locations

from: Port of Coquille records & Farnell Report (1979)

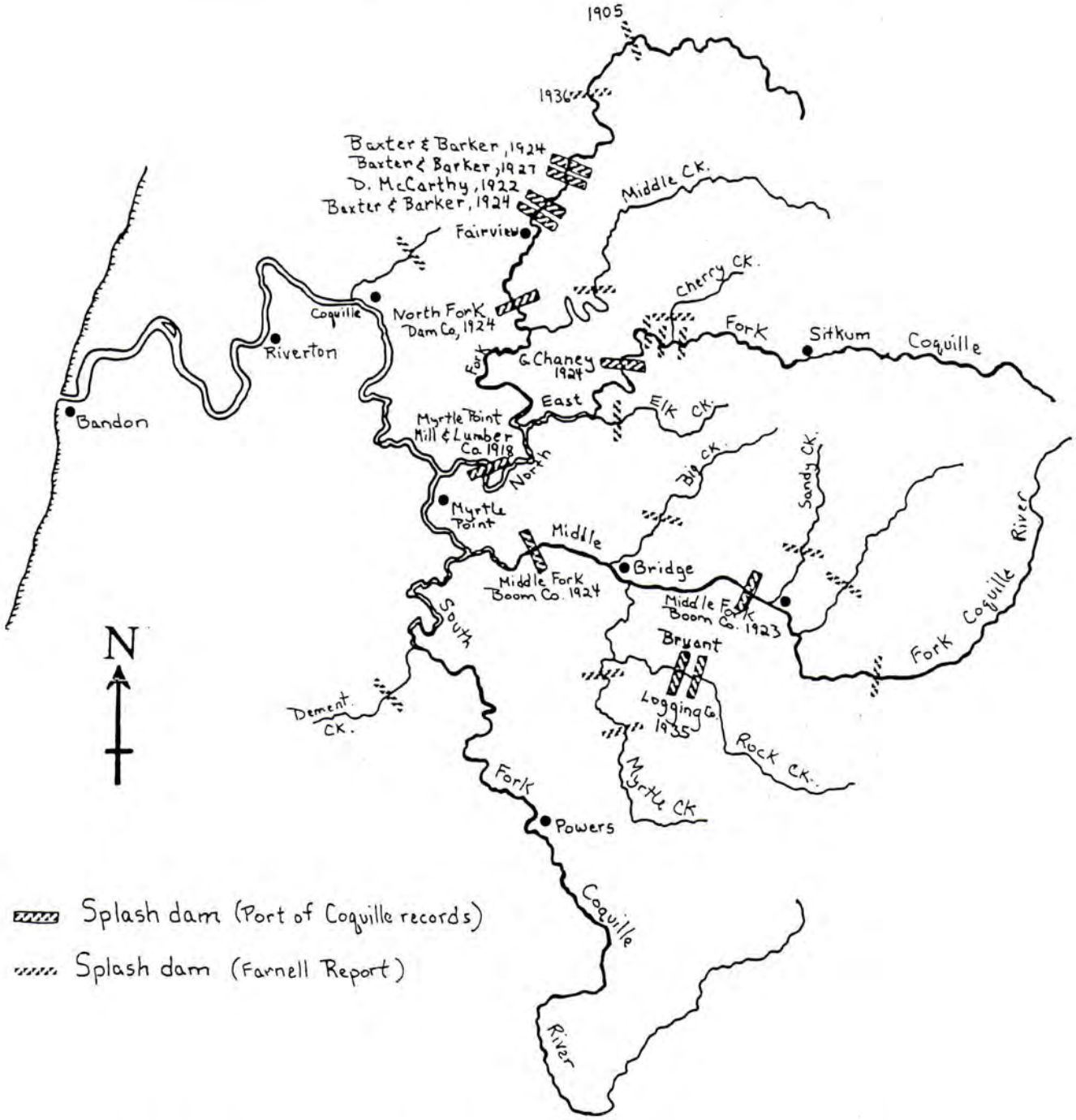


Figure 3.3.4.**4.** Splash dam locations in the Coquille Basin. Compiled from Port of Coquille archives and Farnell, (1979).

A more convenient and effective method of stream log transport was to augment stream flows through the construction of wooden dams that could store water that would be released when needed to float the logs downstream. By the early 1900s splash dams were being used on the Coquille Forks and on many of their tributaries. At least twenty-five of these dams were built during the era of splash dam operations on the Coquille system between about 1905 and 1935 (Figures 3.3.4.4-9). At least 122 miles of channel in the Coquille basin were involved in transporting logs, and many of these miles were below splash dams (Farnell 1979). (This distance includes nonaugmented-flow log drives.) A good deal of blasting of boulders and removal of channel wood was necessary to clear the channel for both forms of log drives.

The splash dams were an important factor in the success of the timber industry, when timber supplies in the lower areas dwindled and companies moved farther into the watershed for new sources of timber. However, there were consequences such as bank erosion, channel bed and bank scouring, sedimentation, and loss of stream habitat in the operation of these dams on the streams.

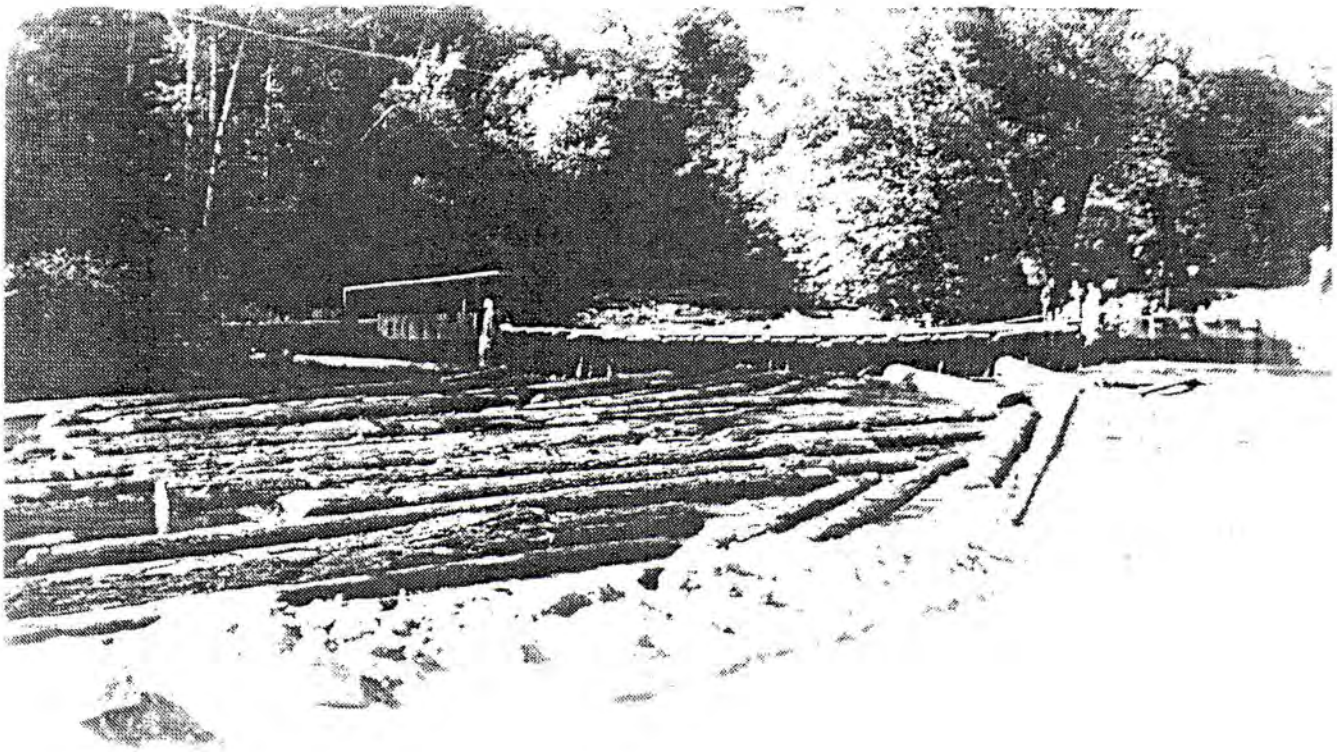
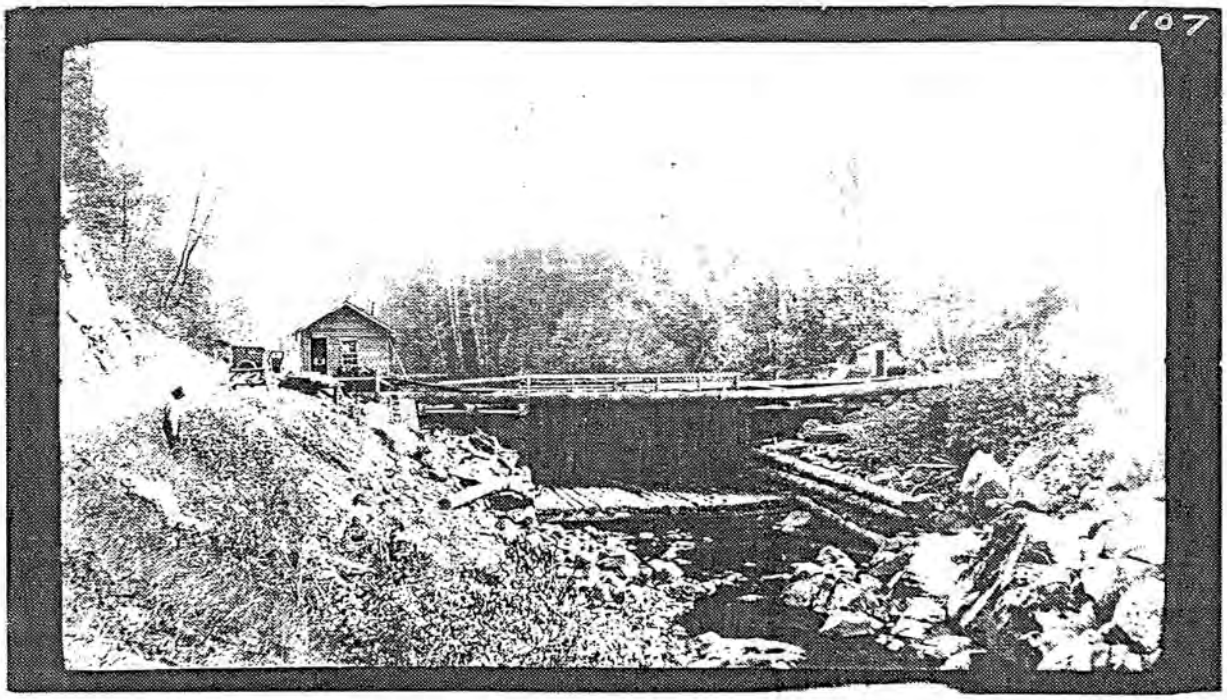


Figure 3.3.4.**5.** A splash dam, possibly on the North Fork, ca. 1920s (Courtesy of the Bandon Historical Society).



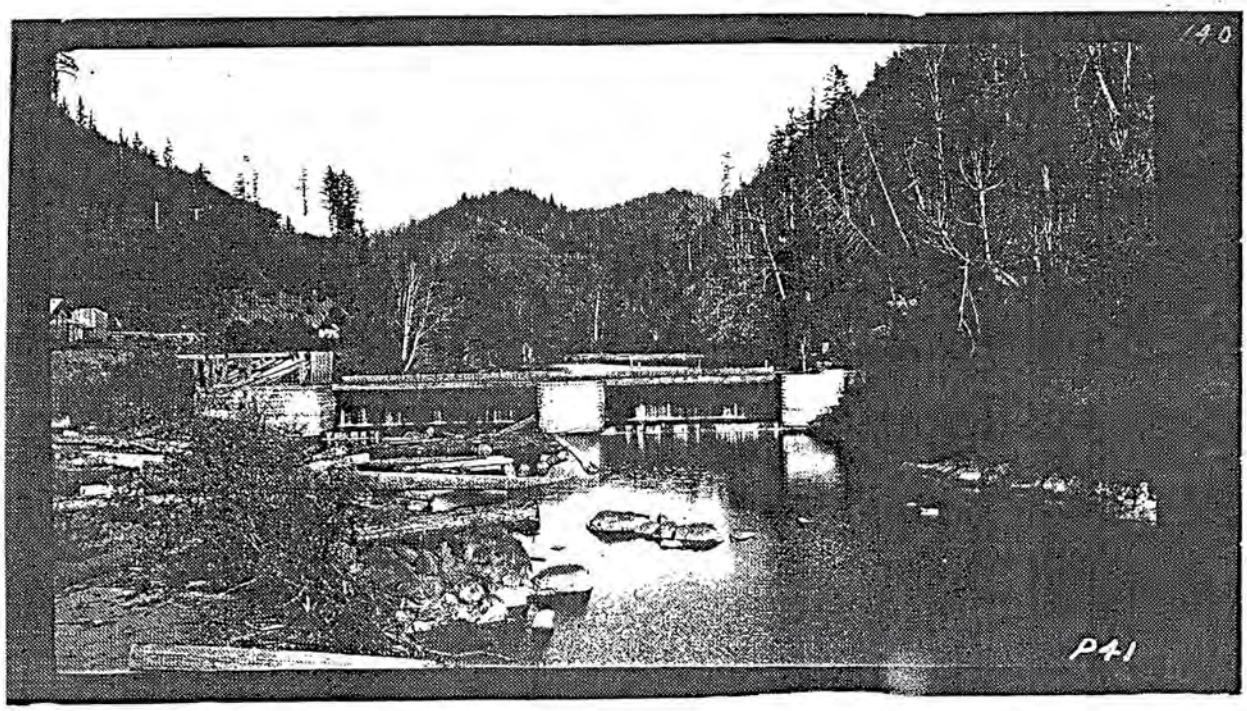


Figure 3.3.4.6 **a & b.** Two of the three splash dams built in the 1920s and operated by the Middle Fork Boom Company on the Middle Fork of the Coquille River (Courtesy of the Port of Coquille, photo. # p140 & p41).

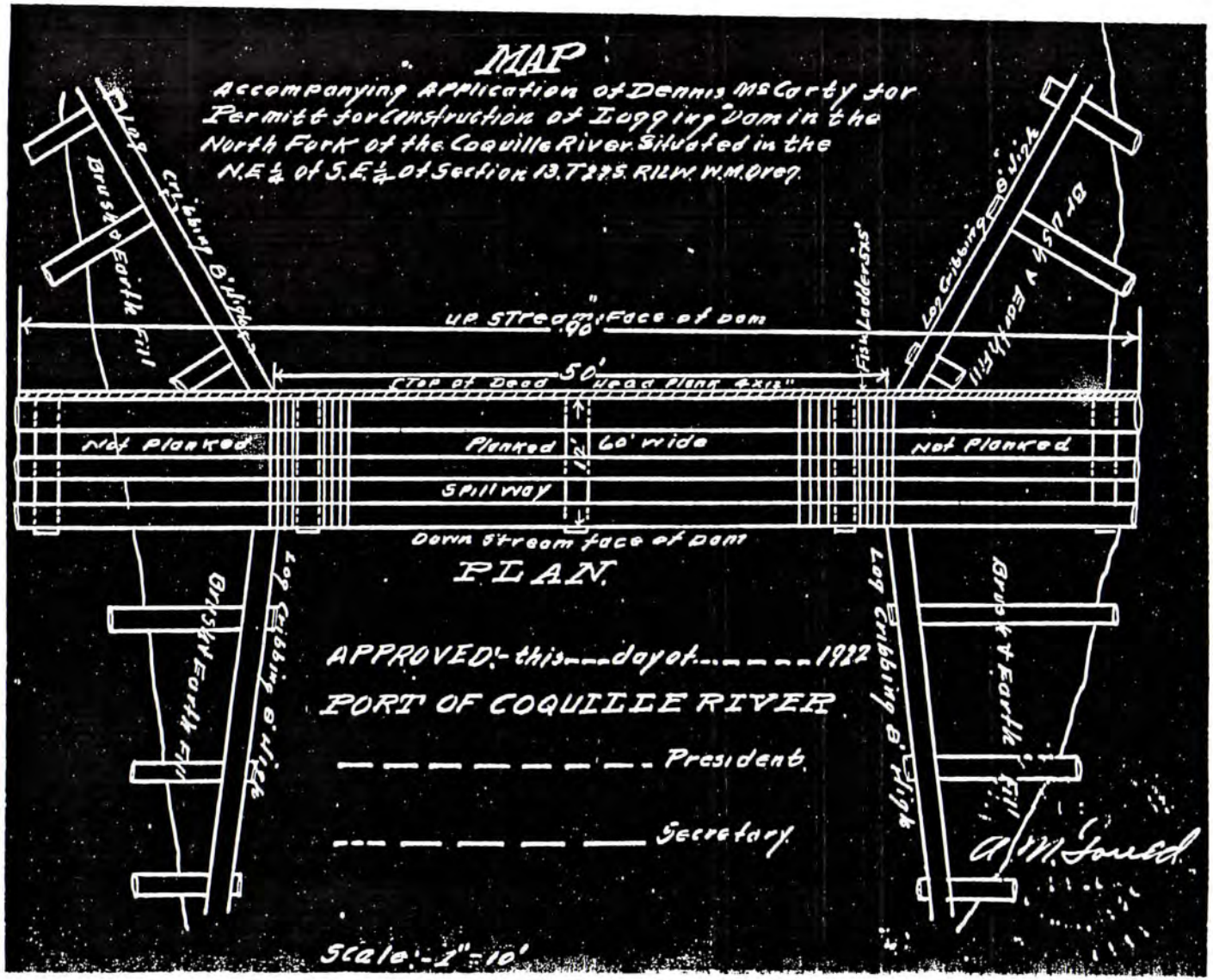


Figure 3.3.4.7. Splash dam plan built by Dennis McCarthy on the North Fork of the Coquille River in 1922 (Courtesy of the Port of Coquille).

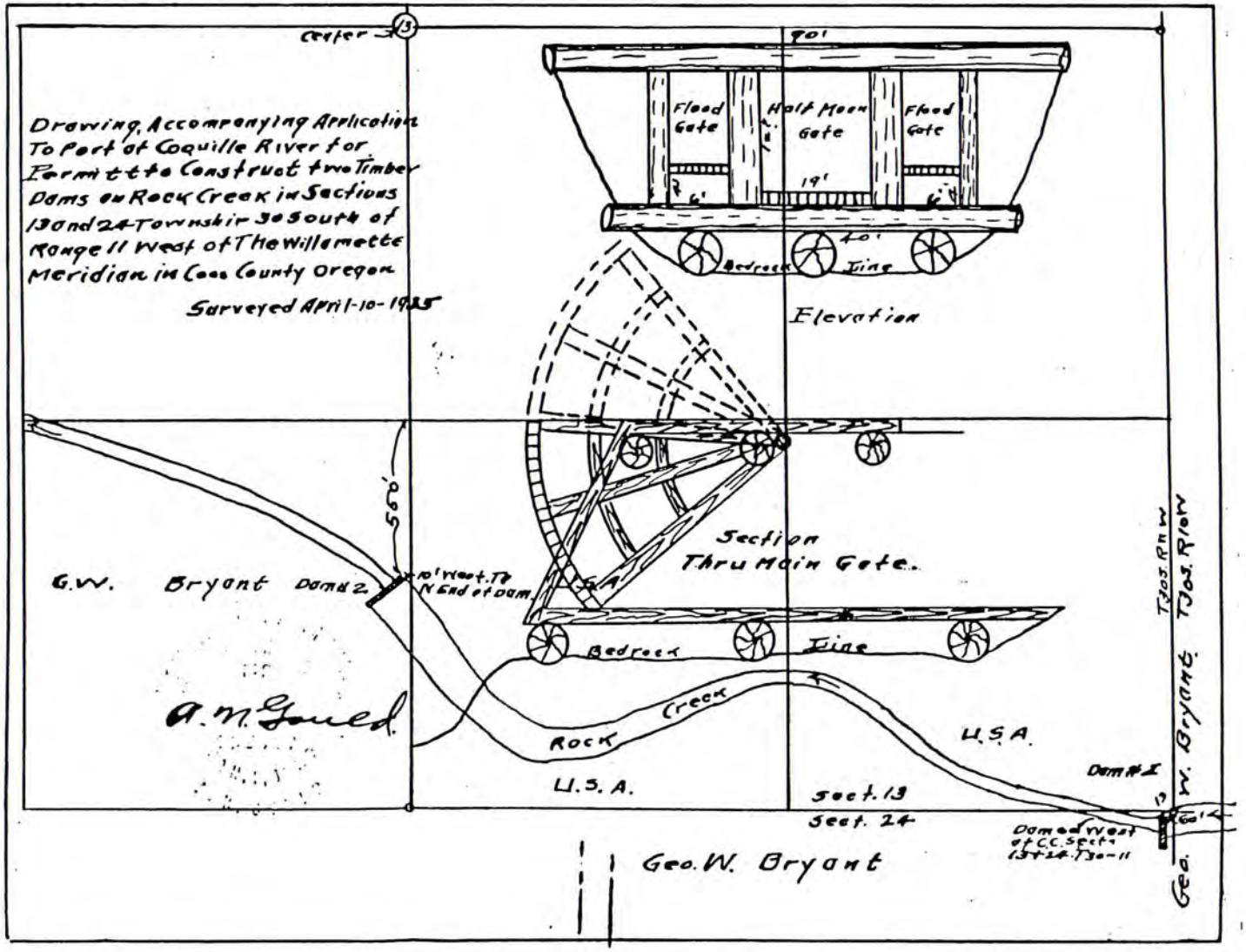


Figure 3.3.4.8. Plans for a splash dam on Rock Creek (the southern tributary to the Middle Fork), 1925 (Courtesy of the Port of Coquille).

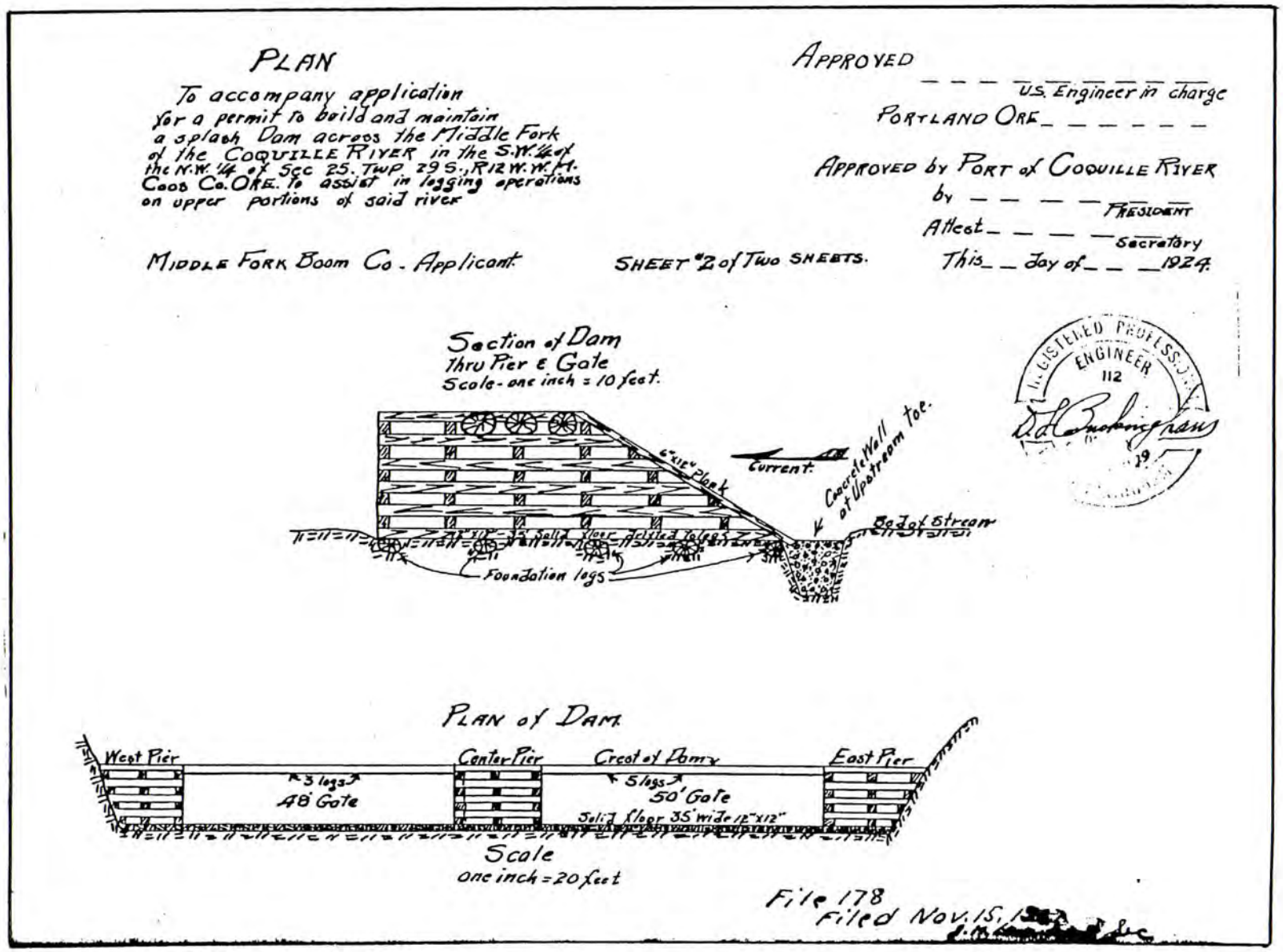


Figure 3.3.4.9. Splash dam plan for a Middle Fork dam, 1924 (courtesy of the Port of Coquille).

The Port of Coquille Commission was created in 1911 to serve the interests and needs of upriver users. It was felt that the ocean port downriver would be focusing on lower river uses. It was the Port of Coquille's responsibility to give authorization to splash dam companies for "rights of public navigation." As a public agency it also facilitated the improvement and maintenance of channels for navigational purposes, including log transportation. This responsibility included the dredging of channel shoals and the removal of snags. It also included the cutting of trees and brush from the banks to open and widen the channels. For many of the tributaries on which splash dams were used because of their narrow width, it is difficult to imagine how they successfully ran logs. The channels were made even narrower by the natural

Table 3.3.4.1.

Funds Spent on Bank Brush and Tree Removal, Primarily for Log Drive Purposes by the Port of Coquille River, 1911-1928*

Year	North Fork	East Fork	South Fork	Middle Fork	Middle Ck.
1911	[Port formed late in the year- no money spent]				
1912	[little money available]				
1913	$ 451.05	$ 980.35	$ 487.85	-	-
1914	34.00	176.50	-	-	-
1915	643.50	1100.00	-	-	-
1916	195.37	96.46	-	-	-
1917	38.67	8.07	[World War I]	-	-
1918	928.52	303.62	-	-	-
1919	3514.00	743.00	-	-	-
1920	963.00	-	-	-	-
1921	2480.00	931.00	-	-	-
1922	?	records not	available	?	?
1923	?	" "	"	?	?
1924	3740.60	743.33	327.17	312.52	947.97
1925	3754.43	168.98	216.60	**	-
1926	362.29	4.98	-	-	-
1927	696.29	122.08	-	-	55.22
1928	228.47	90.00	111.22	-	801.44
TOTAL:	**$17,992**	**$5,284**	**$1,143**	**$312**	**$1,805**

* Data from Port of Coquille Annual Reports to the U.S. Army Corps District Engineers in Portland, Oregon. The archival material available ends in 1928. More work may have been done later by the Port.

** Blasting boulders in the channel at Carlyle Bar on Middle Fork, $193.

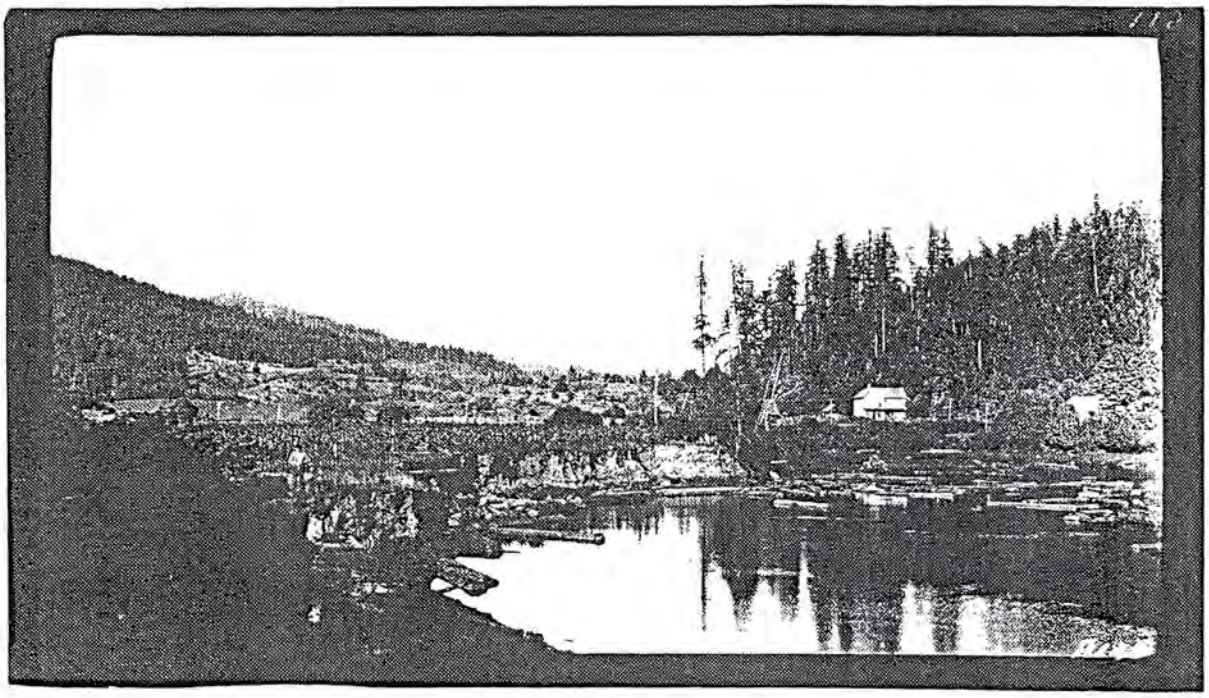


Figure 3.3.4.**10 a. & b.** Port Orford cedar logs ponded on the Middle Fork above a splash dam. Photograph (a) taken looking downriver above the middle dam; (b) looking upriver at same spot, 1929 (Courtesy of the Port of Coquille: photo. # p144 & p145).

Figure 3.3.4.**11.** Log landing on the North Fork of the Coquille River (Courtesy of the Douglas County Museum, Iris Helliwell, File # 3175).

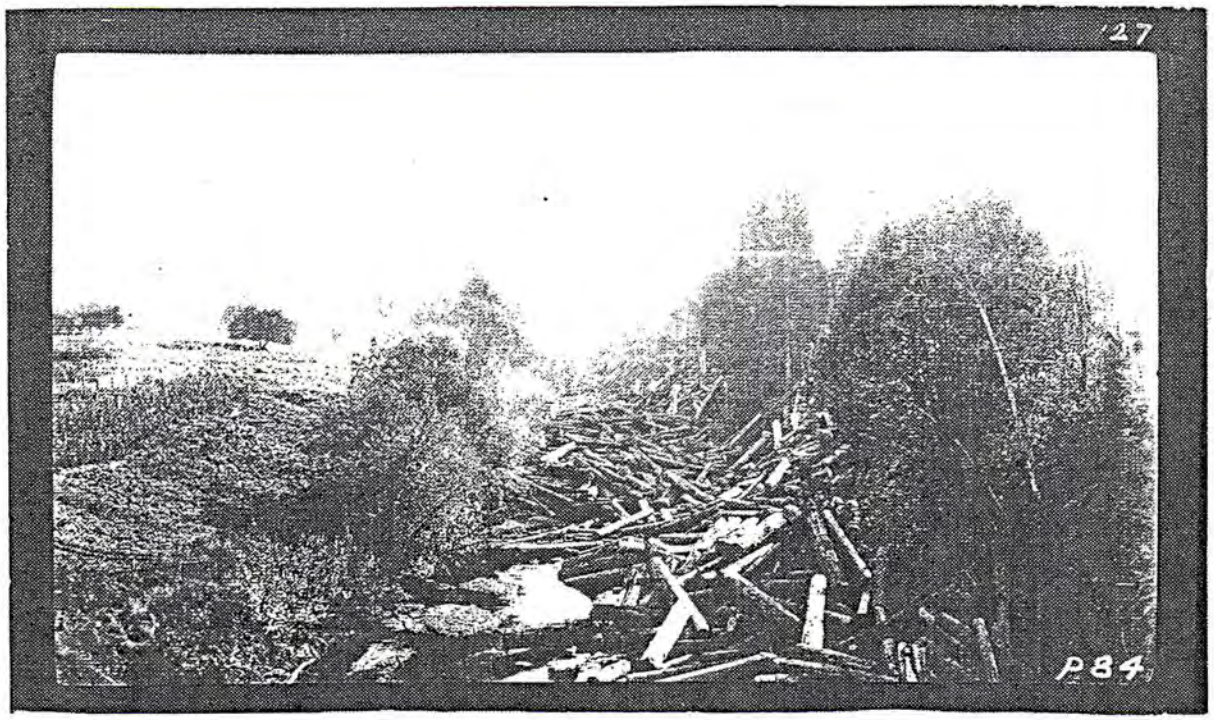


Figure 3.3.4.**12.** Possible log landing. Photograph was taken on the Middle Fork near Bridge, Oregon in 1929, (Courtesy of the Port of Coquille, # p84b).

brushy and larger vegetation that grew on the banks and sometimes overhung the channel. The Port of Coquille spent at least $26,000 in the cutting of the bankside vegetation between 1913 and 1928 (Table 3.3.4.1).

The work by the Port was not the only effort to clear sections of stream for log drives. It was reported in the Coos County Labor Liens that William Northrup cleared brush, logs and debris from Myrtle Creek in about 1916, so that wood could be floated down to River Mile 8 (Farnell, 1979). It is highly probable that the Middle Fork Boom Company also cleared banks and opened up the channel. Landowners along the forks probably at times cleared their sections of channel as well for boat traffic.

The effectiveness of the bank vegetation clearing can be best conveyed by the following example. In 1914 the Port of Coquille reported to the U.S. Army Corps of Engineers the huge success of removing trees and brush from the banks of the last three miles of the East Fork, a substantial effort for which they spent $980.35.

> **"The stretch of the East Fork that was improved, is benefited to the extent that where it formerly took about three days to work a drive of a thousand saw logs through the said three mile stretch it now takes about one and one half hours for an equal amount of logs to pass through"** (File #12, Port of Coquille).

It appears that the Port recognized some of the potential negative consequences as well as the navigational benefits of removing bank vegetation, and it may have attempted to minimize the impacts while providing for log transportation. In 1915 a set of instructions to the foreman in charge of channel improvement work included the following:

> **"Where there are indications that the river banks are washing or being undermined or on the outside curve of sharp bends and elsewhere there is a strong possibility of the river banks washing, you will use care in cutting the brush at the said places by leaving it long or not cutting in order that the river banks will be afforded all the natural protection possible consistent with putting the river in good shape for navigation. It is desired to conduct all the improvements without incurring the ill will of the soil owners along the river, however unreasonable requests to have brush left on their river banks by the soil owners will not be entertained. All brush and trees making an obstruction or interfering with navigation may be legally cut. You should use judgement and leave such protection as is possible where the river is washing or apt to wash its banks."**
>
> **"Where large trees are causing the banks of the rivers to cave or where there is immediate danger that the said trees or tree will cause the banks to cave you will use your best judgement in felling the said trees or tree or girdling them as will most effectively prevent them becoming a menace to navigation"** (File #25, Port of Coquille).

A second memo followed a week later with the following instructions:

> **"At places where the river bank is washing, and it is possible to widen the river by clearing the opposite bank, take particular care to clear the opposite bank from the washing point, in order that all the opening possible may be afforded for the river at that place."** (File #25, Port of Coquille).

It appears from these instructions that bank failure was already an anticipated product of river use, when the Port acquired the responsibility of enhancing channel navigability. According to Farnell (1979), the Forks and some of the tributaries had transported logs prior to the Port's formation.

Whether multiple bank failures was a natural or human-induced phenomenon at that time is a inherent question, especially since tidal river sedimentation is of concern today to people in the

Figure 3.3.4.**13.** Log pile-up on the East Fork of the Coquille River at Minard's Covered Bridge, circa 1920's (Courtesy of the Douglas County Museum, Iris Helliwell, File #3174).

Coquille area. The U.S. Army Corps of Engineers reported in its Annual Report in House Executive documents, First Session of the 52nd Congress, 1891-92 that,

> **"All this is shown by the fact that where the growth is left untouched no change [in the banks] has occurred,...but where the banks have been stripped, abrasion by the drift of the last freshet is plainly marked, especially on upper part of the river, and channel changes of the past are only where the banks have been cleared of their natural protection."**

The Corps in this case was referring to the section of river beginning at about Myrtle Point and traveling on downriver, and appeared to be referring to land owners' practices of **"clearing the river banks at places entirely of timber and willow growth"** to create **"denuded banks."** They did not comment on the purpose motivating such vegetation removal, but they viewed the practice as detrimental to bank stability. There are no descriptions in early settlement historical data of naturally exposed, or unstable and eroding, banks other than a few examples at tight river bends.

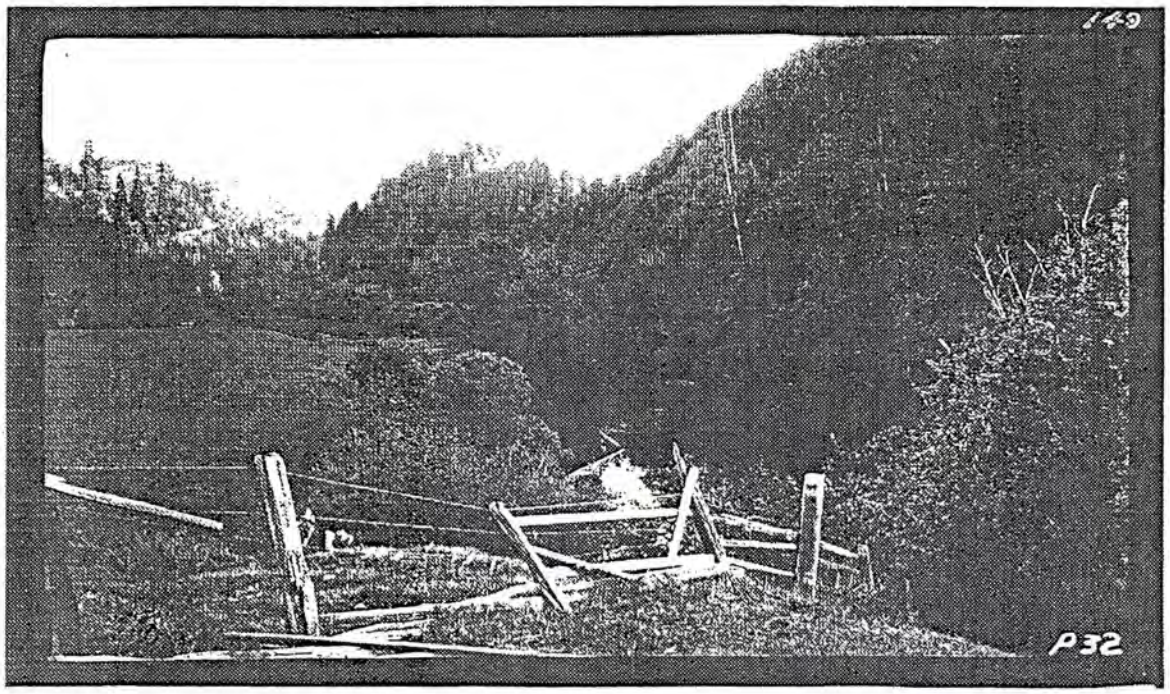


Figure 3.3.4.**14.** Farmland area bank failure on the Middle Fork in 1929 (Courtesy of the Port of Coquille, photo. # p32).

Table 3.3.4.2. Examples of bank vegetation removal projects above Myrtle Point mainly to facilitate log drives.

Year	Location and Description by the Port of Coquille
1913	The first year that the Port was funded: **"removing trees and brush on North Fork to Gravelford (worst places only), $451, removing trees and brush on East Fork clean for a distance of three miles up from the mouth [of] the East Fork, $990..."** (Annual Report of the Port of Coquille to the Corps, File # 12).
1920	**"On the East Fork trees and brush were removed from the worst remaining places, so that this stream is now in fine condition for the economical running of saw logs, $743. On the North Fork operations were started at its mouth and completed to the Cooper bridge a distance of three and one-half miles, all overhanging growth being removed excepting were necessary protection to banks was required to be left, $3,514."** (Annual Report of the Port of Coquille to the U.S. Army Corps of Engineers, File #92).
1922	**"On the North Fork continuing improvement by removing brush and trees from the banks, and also removing snags and islands, $2,480. On the East Fork removing brush and trees from the banks, $931. This season's work on the East Fork nearly completes the original project on the East Fork, its banks having been cleared from its junction with the North Fork...[up] a distance of approximately six miles."** (Annual Report of the Port of Coquille to the Corps, File # 106).
1925	The Port of Coquille reported the continuing improvement of Middle Creek and the North Fork by the **"removing trees and brush from banks,"** at the cost of $697.99 and $3,754.43 respectively. The Port also cut brush on the South Fork during that year. (Annual Report of the Port of Coquille to the U. S. Army Corps of Engineers, File # 153).
1928 -	The Port commented on completion of work on Middle Creek in 1927, and of doing maintenance work on the tributary in 1928. The Port also performed maintenance work on the North and East Forks. (Annual Report of the Port of Coquille to the U. S. Army Corps of Engineers, File # 176).

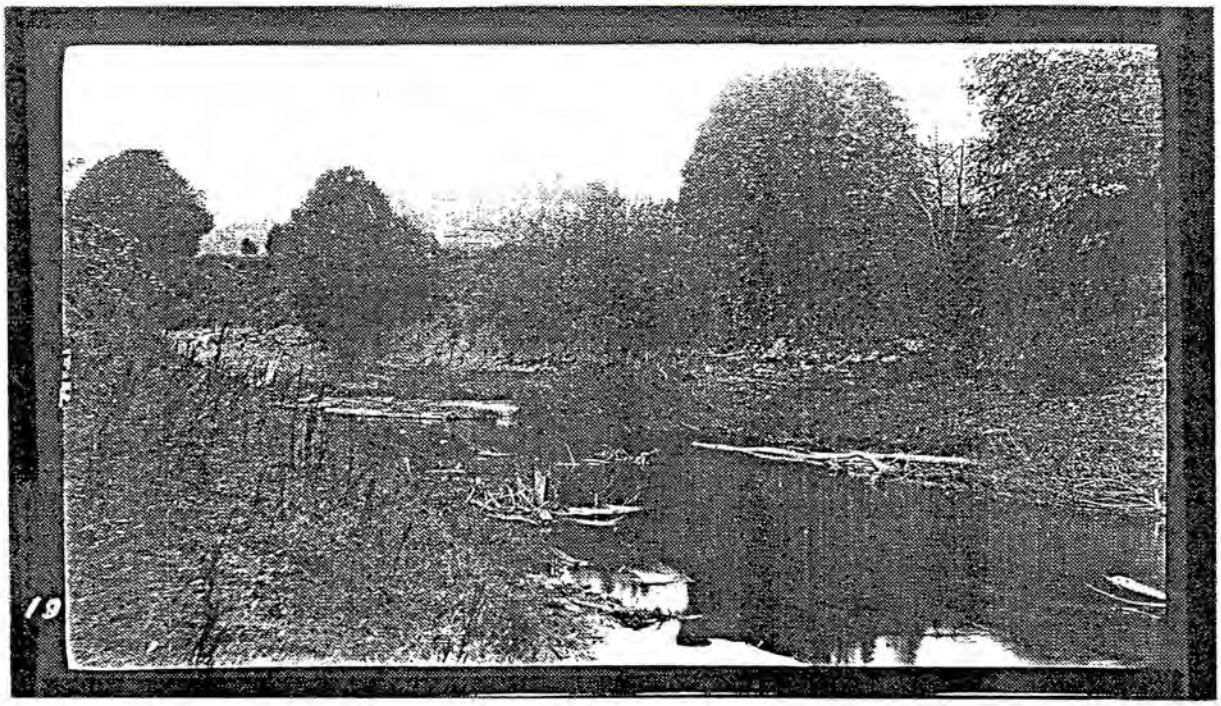
In the Port's annual report of the first few years of its activities to the Corps in Portland in 1918, Secretary Gerhart commented,

> **"There was some doubt when commencing this work but that the riparian lands would be subject to unusual washing. The experience so far indicates that there is little possibility of abutting land being injured, and as logging and boating streams the improvement is so great that it is hardly possible to make a comparison between now and formerly when it was most impossible to get logs in quantity out of these streams at all."** (File #63, Port of Coquille).

The Port of Coquille reported minimal bank problems associated with channel vegetation modifications after the first few years of bank work. The splash dam log drives and the bank brush cutting efforts and general channel clearing, however, eventually created conflict between land owners and splash dam operators.

Ultimately splash dam operators and the Port of Coquille became the target of law suits for bank damage often associated with splash dam operations, as it cleared river channels to facilitate

Figure 3.3.4.**15.** East Fork of the Coquille along the Weekly property in 1929; the bank loss during log drives following the removal of bank vegetation by the Port was the subject of a law suit (Courtesy of the Port of Coquille, photo. # 13-Weekly).



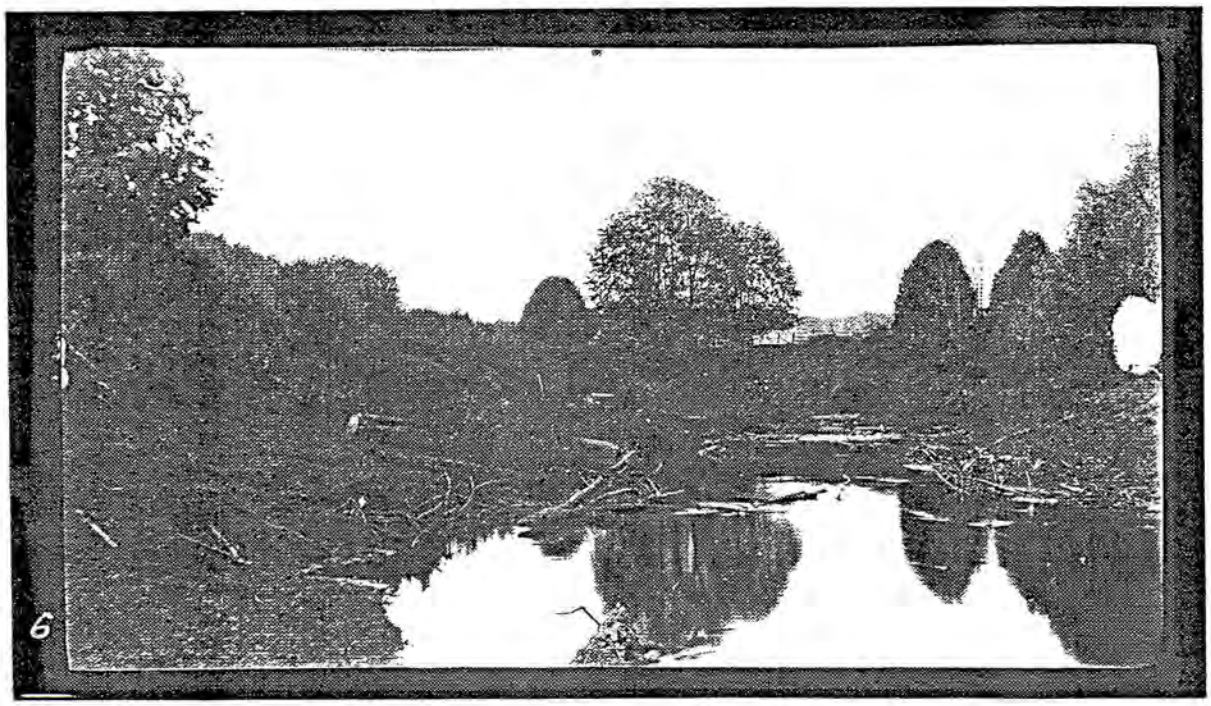


Figure 3.3.4.**16 a. & b.** The East Fork along the Weekly property; photographs in connection w/ the Weekly vs. Port law suit, 1929 (Courtesy of the Port of Coquille, photos. # 6 & 19 - Weekly).

log drives. A number of law suits and complaints were filed by riparian owners against the Port specifically regarding the cutting of bank vegetation and the alleged negative consequences on the banks (Figures 3.3.4.15 & 16). The Circuit Court records document a case of the Weekly estate alleging wrongful acts of cutting:

> **"...large numbers of Alder, Ash, Maple, Willow and Myrtle trees, together with large quantities of small trees, brush, shrubbery, and other plant life, all of which...formed a natural and necessary protection to the banks of said stream [East Fork]...against all injuries and damages to the lands...from the flow of the water...and from the floating of logs or other navigation down said stream..."** (File #211, 1929).

Other complaints included ones made by Shull and Love, and Dye. Dye was awarded a judgement of $275, and Shull and Love, $342 for bank damages. What appeared to be the deciding legal point in these law suits was whether or not the Port had "trespassed" over private land while getting to the banks to cut the bank vegetation, not the fact that the banks had experienced erosion. According to the court's determination, if the Port had had permission to come on the land to do the bank work, then they would not have been liable for the bank erosion damage.

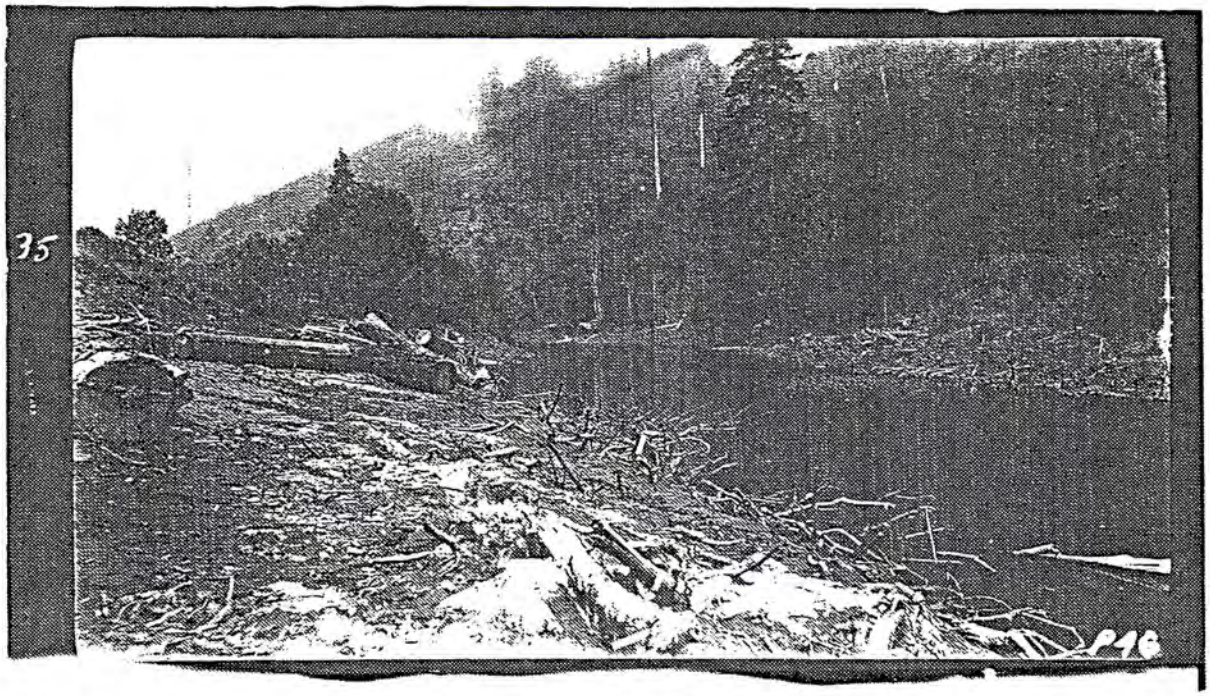


Figure 3.3.4.**17.** Middle Fork of the Coquille River exposed bank after splash drive activity and probably brush cutting, 1929 (Courtesy of the Port of Coquille, photo. # p46).

The bank vegetation and the channel bed were altered by splash dams and log drives. A 1929 photograph (Figure 3.3.4.17) of the Middle Fork shows the stub remnants of vegetation on bare bank after splash dam drives by the Middle Fork Boom Company.

Splash dam operators met with opposition to their log drives. The following is an attorney's complaint on behalf of several landowners. Keep in mind that comments, when they are made on behalf of a client, have to be read within that context. In October of 1928, one attorney wrote to the U.S. Army Corps of Engineers on behalf of his "clients," to say the following:

> **"Within approximately the past six years, the various logging and boom companies operating on the Middle Fork of the Coquille River Coos County, through negligent and vicious methods of operations have caused to be washed into the lower Coquille River not less than 15 acres of farm lands. In addition to this, the matter of logging has caused untold numbers of yards of rock to be washed down this same river into the lower river..."**

His interpretation of the situation was that,

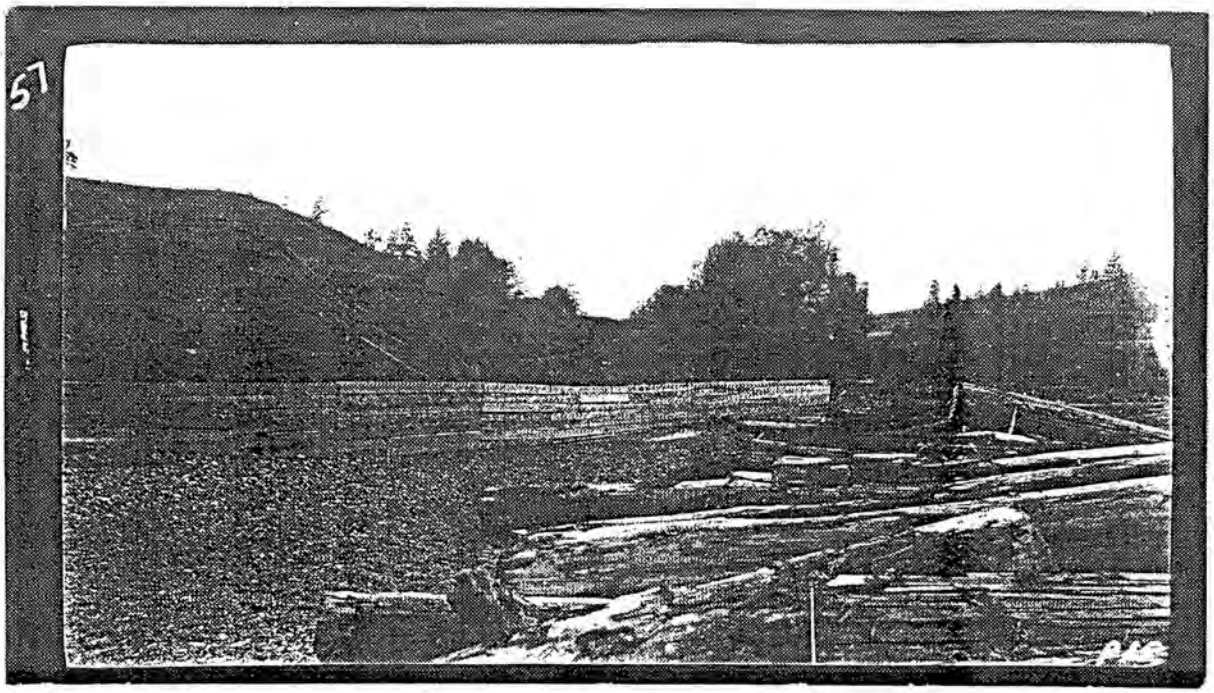
> **"the river used to flow reasonably slow; but, since the rocks have been blasted and crushed the river bed is nothing less than a sluice box."** (Port of Coquille District Engineer File #176).

George Chaney, who owned and operated a splash dam on the East Fork of the Coquille, in 1924 indemnified property owners in the amount of $5,000, should they suffer damage due to the operation of his splash dam (Port of Coquille Dist. Engineer, File #92).

The Port of Coquille, possibly aware of the potential of damage related to splash dam operations, included a paragraph in the "rights of public navigation" authorization letters, as in the June, 1922 letter to Dennis McCarthy who wished to build and operate a splash dam on the North Fork.

> **"That this authority does not authorize any injury to private property or invasion of private rights...that the permittee assumes all responsibility for damages...to riparian property..."** (Port of Coquille, File #128).

This clause could have possibly been a generic waiver common to public agencies that protected the Port from liability as an authorizing Commission. But it was understood that such consequences were possible.



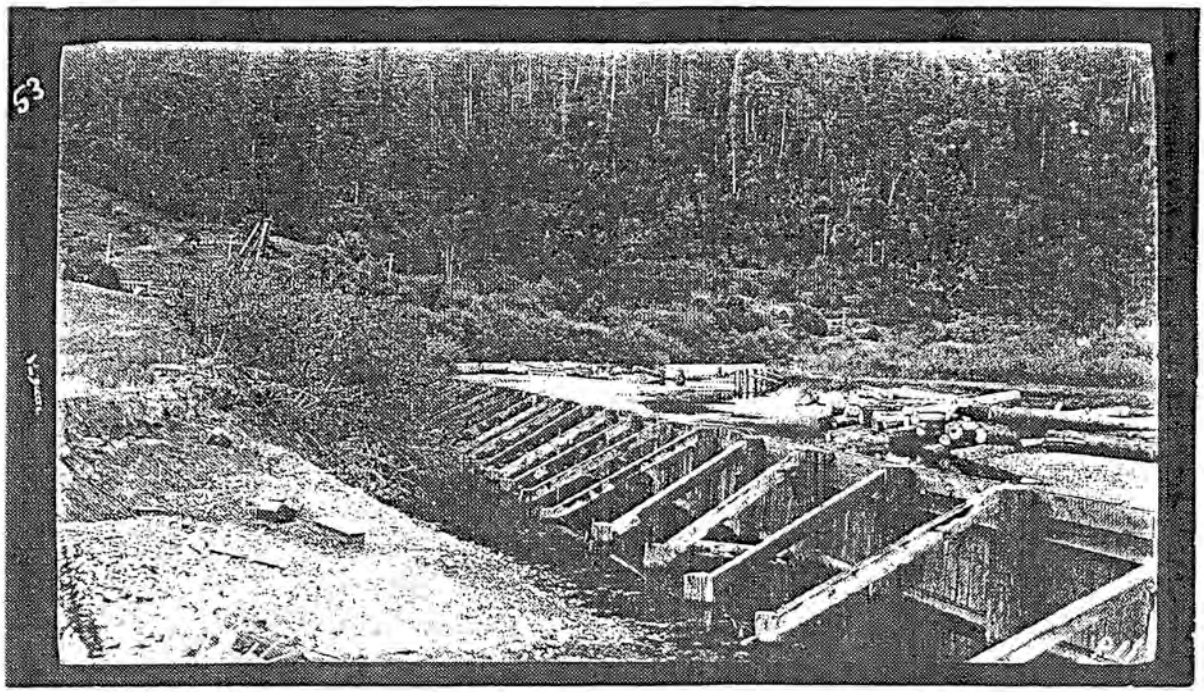


Figure 3.3.4.**18 a. & b.** Bank protection walls built on the Middle Fork. The second photograph is of the backside of wall in the upper photograph (Courtesy of the Port of Coquille, 1929, photo. # p15 & p11).

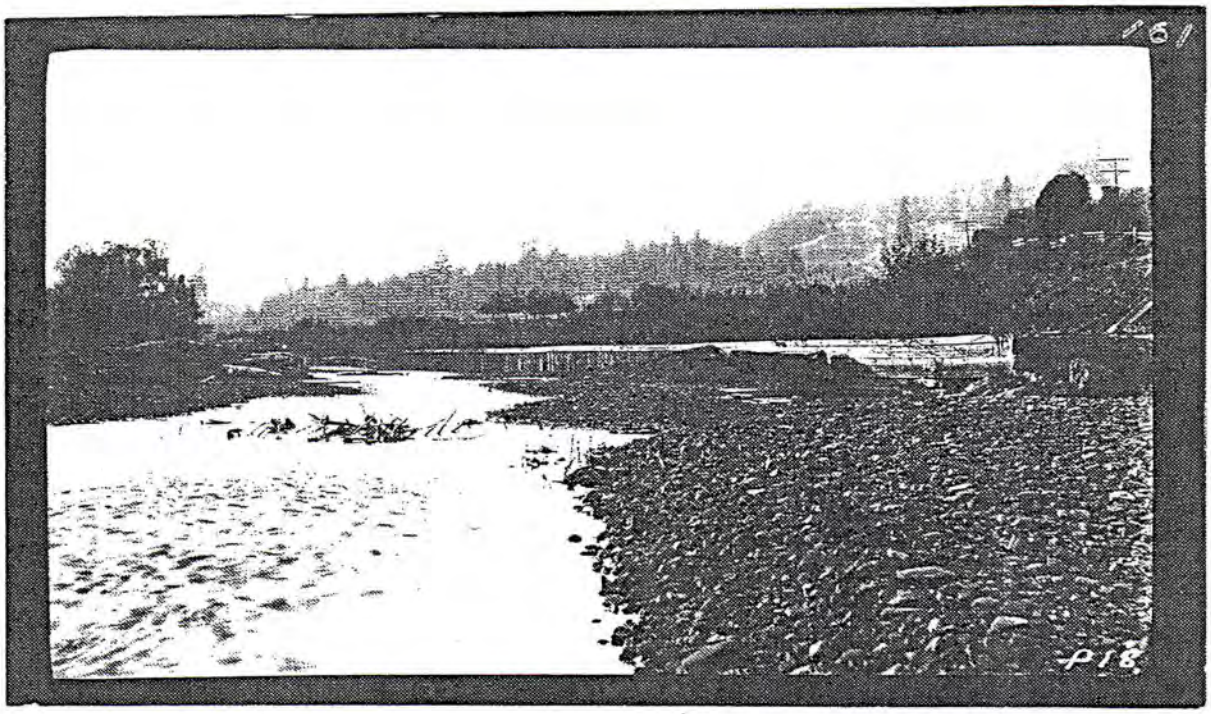


Figure 3.3.4.**19.** A long view of another section of bank protection on the Middle Fork (Courtesy of the Port of Coquille, 1929, photo. # p18).

Bank protection structures and water deflection walls were built on some of the tributaries of the Coquille to restore sections of channel. Photographs were taken in 1929 of some of this bank protection work on the Middle Fork (Figures 3.3.4.18 & 19).

At Carlyle Bar, the river had created a new channel in the wide floodplain by shifting to the south of the existing channel. In the mid-1920s the Port proposed and built a training wall to return the river flow to the old channel (Figure 3.3.4.20).

Another impact of splash dams and log drives on the stream and river channel was the alteration of the channel bed. Boulders were blasted to clear the channel of obstructions, and wood was snagged as well. The result was the removal of possible obstructions to navigation. The consequence of such activities, however, included substantial loss of stream complexity where fish and other organisms might feed or hide. The scouring of the stream bottom by the logs further contributed to channel bed modification.

When the higher gradient streams were cleared for log drives, the removal of stable in-channel large wood and boulders also released stored channel sediment that was trapped and held back by these channel structures. The sediment was then routed

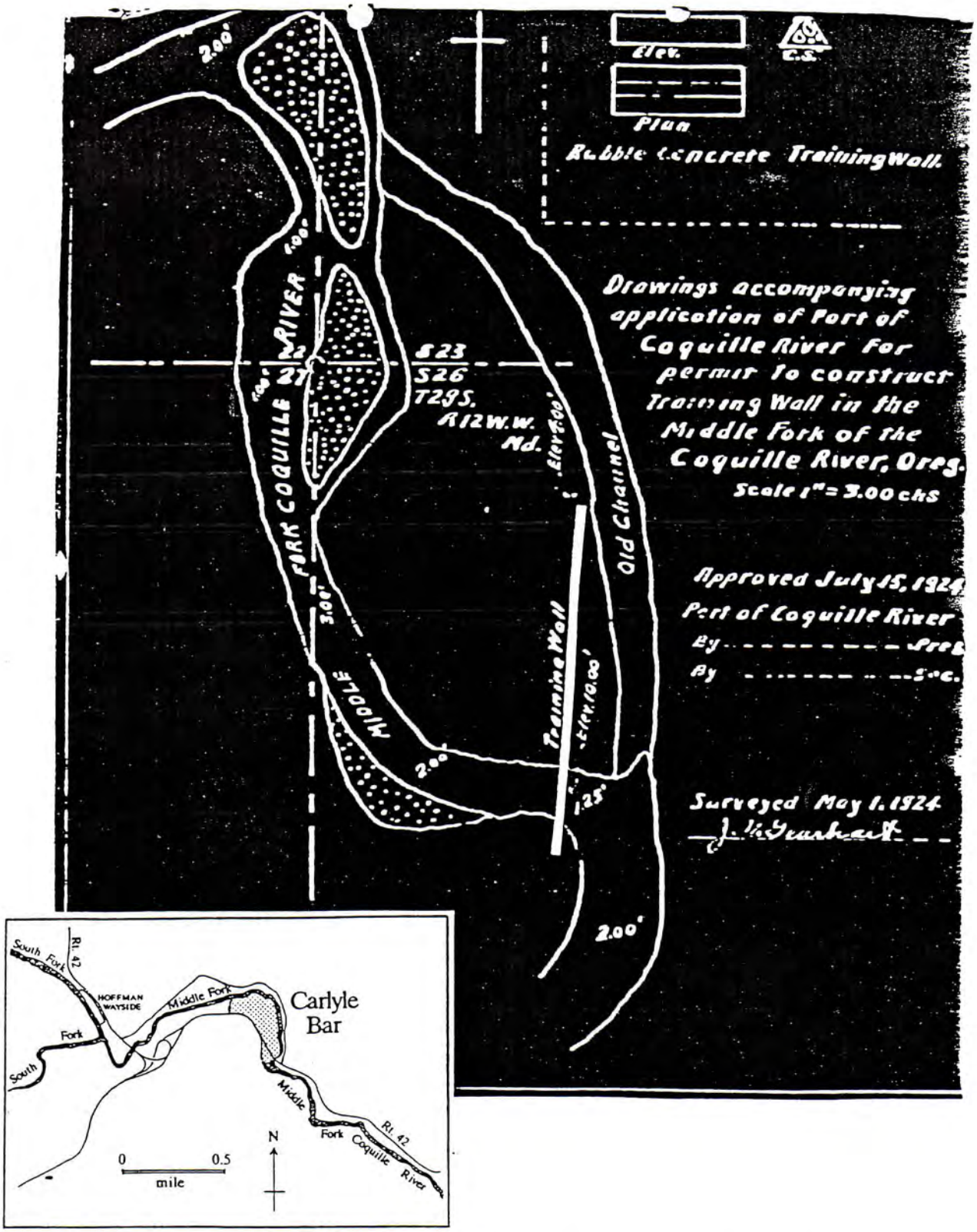


Figure 3.3.4.20. Map of proposed training wall at Carlyle Bar on the Middle Fork of the Coquille River, 1924 (Courtesy of the Port of Coquille).

downriver much faster, and contributed to the higher sediment load that cumulatively created the lower river sedimentation problems. The log drives added to the scouring of the channel, by purging the channel of all but the most resistant, stable bedrock and boulders.

The loss of overhanging bank vegetation, channel boulders, gravel and wood reduced the quality of the aquatic habitat, especially for resident and spawning fish. An environmentally sensitive feature of some of the splash dams, however, was that of fish ladders. Two of these six applications to the Port of Coquille included diagrams showed "fish ladders" as a feature of the dam (Figure 3.3.4.21). One was a permit issued to Baxter and Barker in 1925 for a dam on the North Fork. The other dam was also built on the North Fork, authorized in 1922 and built by Dennis McCarthy. Whether these fish ladders were effective is not known, but attempts were apparently made in some cases to reduce fish obstructions on the Coquille system.

The consequences of splash dam operations and the associated bank vegetation clearing in retrospect appears to have had negative effects on the landscape, and, as in many situations, there was conflict between competing users of the resource. During this era the riparian owners' rights appeared to have been secondary to the economic concern of getting the logs to the mills. The clearing of land for farming to almost the edge of the channel with a narrow vegetation buffer may have further compounded the erosion problem. If a section of bank caved due to loss of bank vegetation and/or abrasive log drives, there was little behind the first line of defense to take over a stabilizing role of the alluvial bank soils.

It would be interesting to compare bank stability and channel composition today to determine to what extent the banks and bed have recovered. Certainly a good portion of the dense, overhanging vegetation has grown back. But the combination of activities may have left certain bank areas less stable than prior to settlement.

River transportation of logs proved to be the most economical for the log companies during the first few decades of the 20th century. (The Smith and Powers Logging Company was viewed to have financial problems related to their investment in its railway system, though other management factors were responsible (Robbins, 1988). However, channel improvement and maintenance were in part subsidized by local taxes in return for County economic prosperity.

More significantly, the secondary economic consequences of river drives (the impacts on the landscape and its resources) were not calculated into the price of the lumber in the marketplace, nor were they borne for the most part by the timber companies.

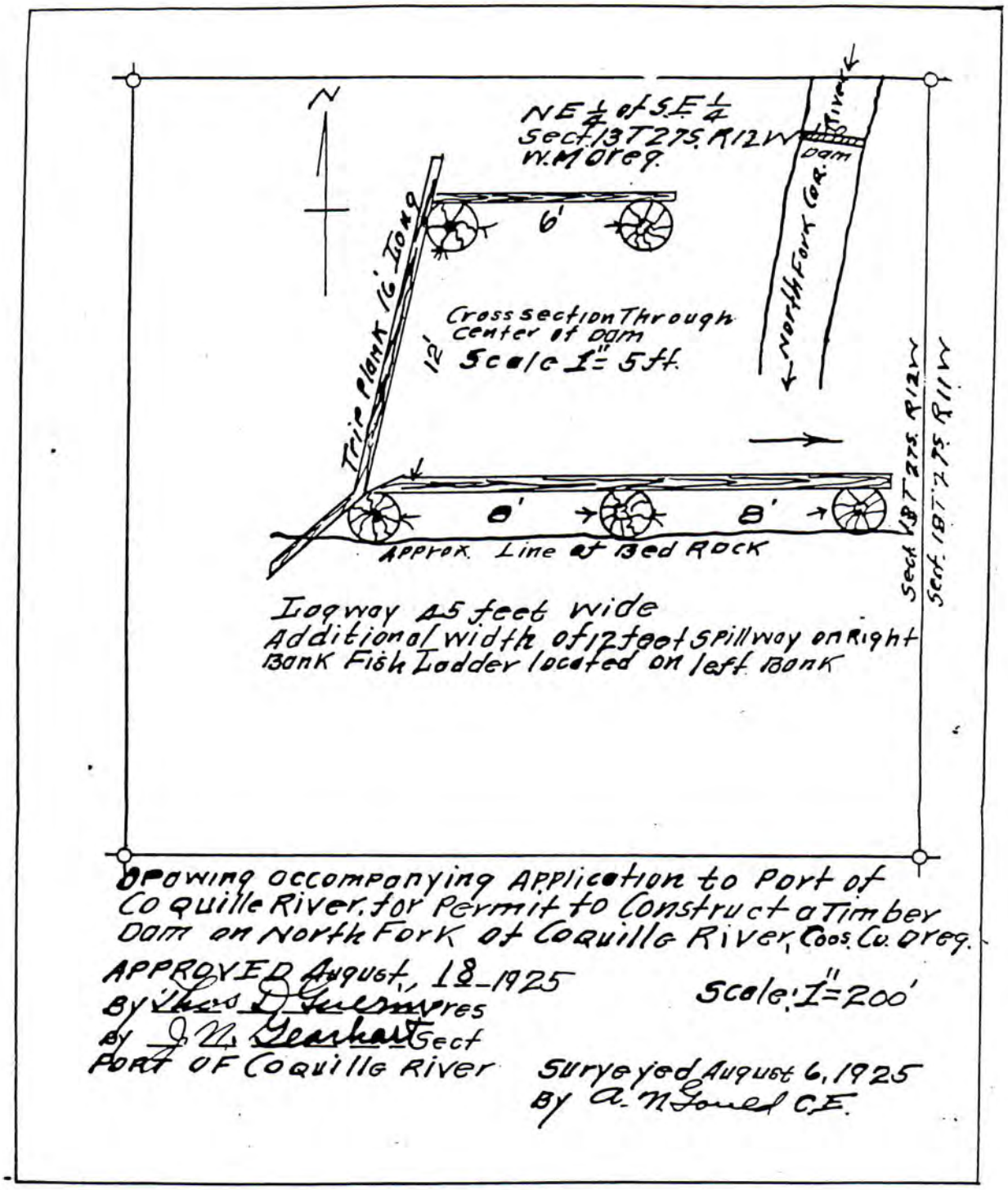


Figure 3.3.4.**21.** Splash dam plans for the North Fork, that included a fish ladder. Baxter & Baker, 1925 (Courtesy of the Port of Coquille).

Instead, the external costs of timber transportation were shouldered by riparian landowners, downriver users, and the aquatic ecosystem.

In summary, the years of the log drives, especially in association with splash dams, appeared to have substantially altered the stability of the stream banks, scoured the stream beds in the Coquille basin and contributed to the sediment load to the lower river. On balance, at that time there were few attractive options for transportation of logs for the timber industry. The efforts by the Port of Coquille Commission and the splash dam companies greatly improved the potential of the waterways to provide an opportunity to transport the logs downriver to the mills.

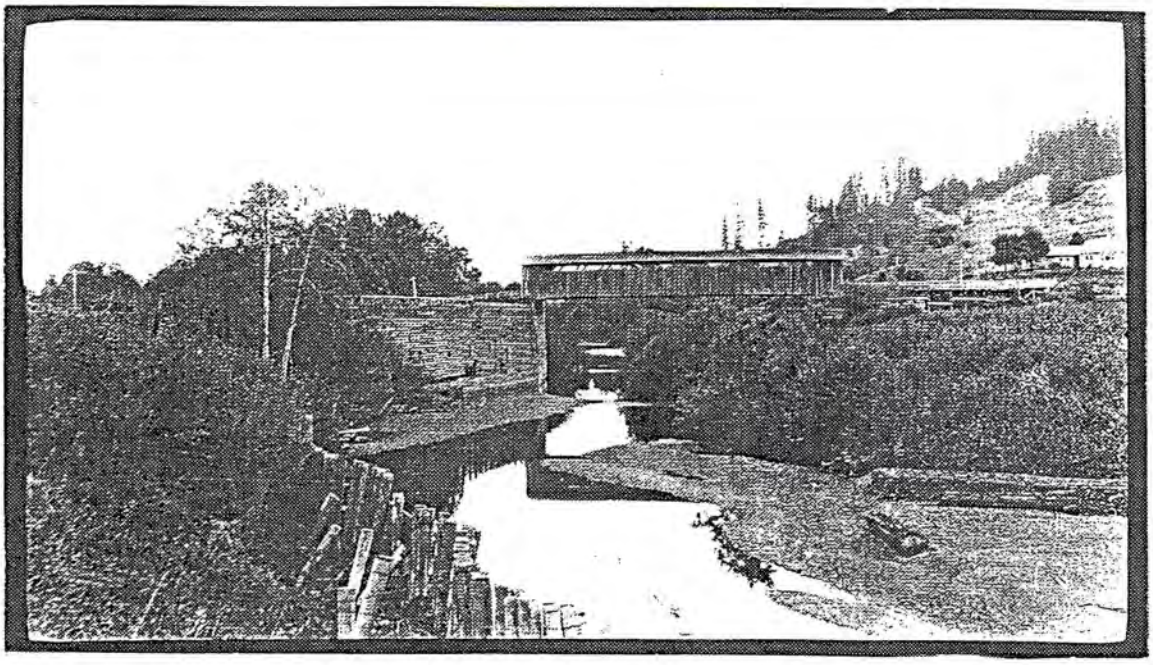


Figure 3.3.4.**22.** The Middle Fork of the Coquille River at the old Rt. 42 bridge in 1929, just upriver of its confluence with the South Fork. Remnants of the bank protection wall are still stand (Courtesy of the Port of Coquille, photo # p5).

Historical Sections References
Sections 3.2 and 3.3

Beckham, Curt. 1989. Tall Timber Tales. Myrtle Point Printing, Myrtle Point, Oregon. 31 pages.

Benner, P. A. and J.R. Sedell. 1987. Chronic reduction of large woody debris on beaches at Oregon river mouths. In: Proceedings of the Society of Wetland Scientists' Eighth Annual Meeting on Wetland and Riparian Ecosytems of the American West, May 26-29, 1987, Seattle, Washington. pages 335-341.

Bennett, George. 1927. A History of Bandon and the Coquille River. The Oregon Historical Quarterly, 28:4, Oregon Historical Society, pp. 331-350.

Bisson, P. A., R. E. Bilby, M. D. Bryant, C. A. Dolloff, G. B. Grette, R. A. House, M. L. Murphy, K. V. Koski and J. S. Sedell. 1987. Large woody debris in forested streams in the Pacific Northwest: Past, present and future. In: E. O. Salo and T. W. Cundy (ed) Streamside Management: Forestry and Fisheries Interactions, pp. 143 - 190. Institute of Forestry Resources, University of Washington, Contribution No. 57.

Coquille River Cleanup. 1962. Oregon State Game Commission Bulletin, 6:17. pp. 3-6.

Dodge, Orvil. 1898. Pioneer History of Coos and Curry Counties. Republished by Coos-Curry Pioneer and Historical Association, Second Edition, 1969, Western World, Bandon, Oregon. 468 pages.

Farnell, J. E. 1979. Coos and Coquille Rivers Navigability Studies. Oregon Division of Sate Lands, Salem, Oregon. 178 pages.

Geologic Atlas of the United States, Coos Bay Folio. 1901. George W. Stose, Editor of Geologic Maps & S. J. Kubel, Chief Engraver, U.S. Geological Survey, Washington, D.C.,

Gharrett, J. T. and J. I. Hodges. 1950. Salmon Fisheries of the Coastal Rivers of Oregon South of the Columbia, Contribution No. 13, Oregon Fish Commission, Portland, Oregon. 31 pages.

Gonor, J.J., J. R. Sedell and P. A. Benner What We Know About Large Trees in Estuaries, in the Sea, and on Coastal Beaches. In: From the Forest to the Sea, the Story of a Fallen Tree. Tech. eds: Chris Maser et. al. Gen. Tech. Rep. PNW-GTR-229. U.S.D.A. Forest Service. Pacific Northwest Station, Portland, OR. pp. 83-112.

Haskin, L. L. 1958. Lincoln County Lore, From the Journal of Lieut. Theodore Talbot, U.S.A. On His Journey Through Lincoln County and Along the Oregon Coast in 1849, Lincoln County Historical Society, Newport, Oregon. 13 pages.

Healey, M. C. 1982. Juvenile Pacific Salmon in Estuaries: the Life Support System. In: Estuarine Comparisons. Academic Press. pp. 315-341.

Instructions to Surveyor of Public Lands in Oregon. 1851. In: A Collection of Original Instructions to Surveyors of the Public Lands, 1815-1881. Collected by: Roy Minnick, (date?), Landmark Enterprises, Rancho Cordova, CA. pp. 221-311.

Kreag, R. A. 1979. Natural Resources of Coquille Estuary. Estuary Inventory Project Final Report, Oregon Department of Fisheries and Wildlife, Portland, Oregon. 48 pages.

Maser, C. 1989. Forest Primeval. Sierra Club Books, San Francisco. 282 pages.

McMahon, T. 1990. Phone conversation.

Nicholas, J. W. 1991. Phone conversation.

Nicholas, J. W. and D. G. Hankin. 1988. "Oregon's Coastal Chinook, A Summary", for: Chinook Salmon Populations in Oregon Coastal River Basins - Descriptions of Life Histories and Assessment of recent Trends in Run Strengths. Information Report 88-1, Oregon Department of Fisheries and Wildlife, Portland / Corvallis, Oregon. 359 pages.

Oregon Original Land Cadastral Survey Notes. 1857-1872. Coos County area Townships. On file at the Bureau of Land Management Office, Portland, Oregon.

Parsons, T. B. 1990. Land Surveyor, Personal conversation.

Perlin, J. 1989. A Forest Journey: The Role of Wood in the Development of Civiliation. New York. W.W. Norton & Company. 445 pages.

Peterson, E. R. and A. Powers. 1977. A Century of Coos and Curry County; A History of Southwest Oregon.Coss-Curry County Pioneer and Historical Association, Coquille, Oregon. 599 pages.

Reeves, G. H., 1990. Personal conversation on coho in the Elk River system..

Reeves, G. H., F. H. Everest and T. E. Nickelson. 1989. Identification of Physical Habitats Limiting the Production of Coho Salmon in Western Oregon and Washington. General Technical Report PNW-GTR-245. Portland, Oregon, U.S.D.A. Forest Service, Pacific Northwest Research Station. 18 pages.

Robbins, W. G. 1988. Hard Times in Paradise: Coos Bay, Oregon, 1850 - 1986. University of Washington Press, Seattle, Washington. 194 pages.

Rosenbauer, T. 1988. Reading Trout Streams. New York, Lyons and Burford, publishers. 162 pages.

Sedell, J.R., and F.J. Swanson. 1984. Ecological Characteristics of streams as an aid to salmonid habitat enhancement. In: W. R. Meehan, T. R. Merrell, Jr., and T. A. Hanley (eds.) Fish and Wildlife Relationships in Old-Growth Forests: Proceedings of Symposium, American Institute of Fishery Research Biologists. pp. 9-16.

Sedell, J.R., and K.J. Luchessa. 1982. Using the historical record as an aid to salmonid habitat enhancement. In: Proceedings of a Symposium on Acquisition and Utilization of Aquatic Habitat Inventory Information. October 28-30, 1981. Portland, Oregon (N.B. Armantrout, ed.) pp. 210-233. West Div. Am. Fisheries Society, Bethesda, Maryland.

Soils Survey of Coos County, Oregon. 1989. Soil Conservation Service, United States Department of Agriculture. text: 38 pages.

Tschaplinski, P. J. 1982. Aspects of the Population Biology of Estuary-Reared and Stream-Reared Juvenile Coho Salmon in Carnation Creek: A Summary of Current Research. In: Proceedings of the Carnation Creek Workshop, a Ten Year Review. Ed. G. Hartman. Malaspina Colloge, Nanaimo, B.C. pp. 289-307.

U.S. Army Corps of Engineers Annual Reports to Congress. 1878-1930. In: House Executive Documents. Various Congressional sessions. Report of the Secretary of War; Report of the Chief of Engineers.

U.S. Geological Survey. 1971. Quadrangle maps, Washington, DC.

Coquille River Depth & Dredging History Summary*
1878 - 1930

Myrtle Point to Coquille City

Pre-1878 Steamers have ascended to above Myrtle Point & small ocean coasters reported to have reached Norway. Few navigational problems with the channel.
Head of tide is 41 river miles from the ocean, at the Middle and South Forks confluence.

1886 "DECAY OF THE CHANNEL"
Steamers experience difficulty during the summer low flows in traveling upriver above the North Fork confluence to Myrtle Point.

1889 FIRST U.S. Army Corps navigational improvement work on the river (other than at the mouth).
SCRAPED BARS between North Fork & Myrtle Point. Removed snags from Coquille City to Myrtle Point.

1890 LANDSLIDE above Myrtle Point on a tributary to the Coquille.

1891 SIX SHOALS have formed on the last 4.5 miles of river between Arago & Myrtle Point. Reported "DEEP POOLS" between shoals.

1892 POOLS between the shoals are filling with "alluvial deposits." Shoals worsen. "While snagging has been beneficial, nature has been filling up the river."
Corps built Wing Dam #1 & snagged the river.

1893 Last 4.5 miles much shallower, and between Roberts Landing and Myrtle Point, depth is 1-3 feet.

1894 Corps SLUICED SHOALS, built Wing Dam #2, and snagged the river.

1897 SEVEN SHOALS (a new one has formed and the existing shoals return.)

DREDGED: 2,402 cubic yards of "sand & fine gravel

Coquille City to Bandon

1878 Coquille River has "features of a natural canal...its channels free from rocks, shoals, or rapids and obstructed by only a few snags."

Captain Parker stated, "that the river was navigable for vessels of 10 ft. draught at low water up to Coquille City."

1890 Coasting vessels that could cross the bar could travel all the way to Coquille City."

1895 Coasting vessels experiencing no difficulty up to Coquille City.

1903 TWO SHOALS have formed in the river channel, one immediately above Bandon, the other about 7 miles upstream. They have become so shallow that they are impeding river commerce.

1904 A THIRD SHOAL forms. "These shoals cause more trouble to vessels than the ocean bar."

1910 SIX SHOALS:

Strangs	4 ft.	Randolph	6 ft.
Parkersburg	5 ft.	Randolph Mill	9 ft.
Walstoms	6 ft.	Bandon Shoal	? ft.

RIVER & HARBOR ACT, June, 1910.
Provides for dredging 9 ft. channel between Coquille & Riverton, & 10 ft. channel from Riverton to mouth & snagging to Myrtle Point.

1911 DREDGED: 130,020 cubic yards of material.

1912 DREDGED: 9,292 cubic yards of material.

1913 DREDGED: 5,332 cu. yds. silt (Strangs Shoal)
23,675 cu. yds. sand (Bandon Shoal)

1914 DREDGED: [illegible]

1897 SEVEN SHOALS (a new one has formed and the existing shoals return.)

DREDGED: 2,402 cubic yards of "sand & fine gravel between Roberts & Rackleff Landings. Pile and brush dikes and shore protection were build along the 5/8 mile stretch between the landings. The river was snagged. After work was completed, steamers could travel up to Rackleff Landing.

1898 Steamers are not able to travel past Norway. North Fork to Myrtle Point channel is 6 inches to 1 foot in depth.

1900 DREDGED: 29,489 cubic yards., mainly sand & fine gravel from shoals from Arago to Rackleff's Landing. Steamers could again travel to Rackleff Landing.

1901 Steamers can no longer travel to Rackleff Landing during low water, maximum draft is 2 feet.

1902 U.S. Army Corps ABANDONS PROJECT to maintain the Coquille River between Coquille & Myrtle Point.

1911 Port of Coquille is formed. Port downriver boundary is Fishtrap Landing (river mile 29).

1915-23 From 1915 to 1923 the Port of Coquille repeatedly DREDGED & snagged the river up to Myrtle Point to a 4 ft. channel. Over 356,000 cubic yards dredged during this period.

1913 DREDGED: 5,332 cu. yds. silt (Strangs Shoal)
23,675 cu. yds. sand (Bandon Shoal)

1914 DREDGED: $47,542 spent (yardage not given).

1916 DREDGED: 6,323 cu. yds. (Strangs Shoal).

1917 SHOALING taking place so that the boat controlling depth is 5.5 feet.

1918 DREDGED: 4,444 cu. yds. sand (Strangs Shoal).

1920 DREDGED: 89,183 cu. yds. sand (Randolph Shoal).

1923 DREDGED: 93,324 cu. yds. sand (Bandon Shoal).
Bandon to lighthouse: 1,675 cu. yds.

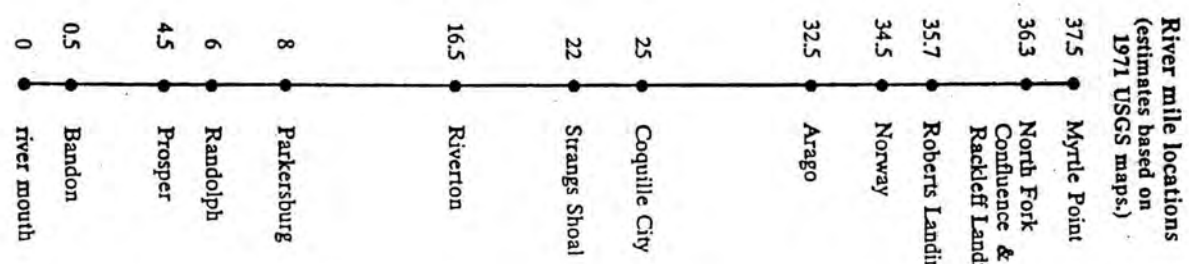
1924 DREDGED: 107,435 cu. yds. sand (Bandon, Parkersburg & Strangs Shoals).
Bandon to lighthouse: 60,546 cu. yds.

1926 RIVER SHOALS BACK. Controlling depths:
to Prosper: 8 feet
to Coquille: 6.5 feet

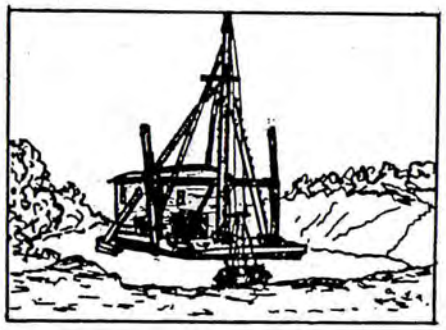
1927 DREDGED: 10,800 cu. yds. sand & gravel from above lighthouse to Bandon.

1930 Dredging at mouth only.

RIVER & HARBOR ACT of August, 1935.
Transfers river channel maintenance in the Coquille River to local interests.



Tidal History



"I have been informed that in 1853, when the settlers first reached the river, the tide rose about 2.5 feet at the junction of the Middle & South Forks, which is 4 miles...above Myrtle Point. At present the tide does not affect the river over 1 mile above Myrtle Point." [1891].

"The river at times past has been a tidal stream as far up as the junction of the South and Middle Forks, 41 miles above its mouth...the range of tide now at Myrtle Point but 2 feet, while formerly it was 4.5 feet." [1894].

"The mean range of the tide at Myrtle Point was said to be formerly 4.5 feet, but in late years landslides have occurred along the head waters and the freshets have brought down much sand and gravel... As the result of this the mean gauge of the tide at Myrtle Point is at present time only about 2 feet." [1900].

"Tidal range extends about 2 miles up the North and South Forks...At Myrtle Point the tidal range is about 1 foot." [1931].

*** main source: U.S. Army Corps of Engineers Annual Reports to Congress.**