



**Appendix A**  
**Public Meetings**

## Grays Harbor County Comprehensive Flood Hazard Management Plan: Meeting IA in Humptulips

ATTENDEES: See Attachment A

COPIES: File

FROM: Andrea Escame-Hedger/SEA

DATE: October 17, 2000

### AGENDA: 9/28/00

- I. Introductions
- II. Goals for project
- III. Goals for today
- IV. Scope and schedule of project
- V. Understanding of flooding problems to date
- VI. Understanding funding sources
- VII. Small group discussion of flooding problems
- VIII. Report issues to group
- IX. Group discussion of conclusions and future actions

### MEETING DESCRIPTION

Lee Hansmann began the meeting by briefly introducing the project and its purpose. She explained the other flood hazard management projects that have previously been done within the County and described the current projects that are being developed along the Chehalis River. She explained the County's, CH2M Hill's, and the citizens role in the development of this plan. Lastly, she introduced the project team (Andrea Escame-Hedger, Jerry Scheller, Laura Schinnel, and Karin Frinell-Hanrahan).

Andrea described the purpose of the project and agenda for the meeting. She then asked each citizen to introduce themselves and state which area they were interested in. The problem areas that were identified are included in attachment B.

Andrea proceeded to explain the goals for today and goals for the project. She asked the citizens to provide comment on the goals for the project and explained that they were dynamic goals and will be refined as we proceed with the project. Some people expressed

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concern about the goal: "Improve County regulations and programs to control future growth impacts on flooding." The concerns included:

- Changes in flood zoning causes increases in flood insurance which they can barely afford.
- Potential devaluation of property
- More land use restrictions on their property

Andrea then explained the scope and schedule of project and the components of a comprehensive plan. She explained that although this is a County-wide plan we will be focusing on the Wynoochee, Humptulips, and Satsop rivers. She explained that previous flood hazard studies have been done in North Beach, S. Coastal, Grayland, and Vance Creek.

Areas of flooding as the County understands them were described. Then contributing factors of flooding were discussed in a broad sense. Lastly, due to limited funding of flooding projects, various funding sources were discussed.

The group was asked to divide into two smaller groups and to mark up maps of their communities. They were asked to identify the problem area, type of flooding and when it occurred, causes of flooding, and the name of a contact person. County and CH2M Hill representatives worked with the citizens to describe the problem areas and mark up the maps. These mark ups will be converted into an ARC VIEW coverage and will be included in the plan.

The majority of citizens did participate in this process; however, some citizens were wary of doing this exercise because they were concerned that this information could be used in a manner which could potentially include their property in the flood plain or that their property would be subject to the updated Shoreline Management program.

Lastly, a description of the goals for next meeting was presented.

To wrap the meeting up, Karin Frinell-Hanrahan, Deputy Director Emergency Manager explained that this project would not be implemented by this coming rainy season. She explained the role of the emergency management office, and passed out literature regarding their program.

Other issues:

People wanted to know why they were invited and why their neighbors were not. Lee Hansmann explained that the majority of people were from a list of repetitive loss areas. Lee stressed to spread the word and to contact her if other interested parties would like to attend future meetings.

ATTACHMENT B  
HUMPTULIPS AREA PROBLEM IDENTIFICATION

NAME	ADDRESS	PHONE	DESCRIPTION
Larry & Judy Thomas	5547 Walker Rd	989-2379	6" in 1997 and 18" in 1999 of water in the house
Robert & Roberta Wagner	19 Walker Bottom Rd	987-2447	Walker Bottom, had water
Thompson			high and dry at store; 1' of water on lower property
Mike Johnson	PO Box 81	987-2206	rental trailer
John & Arla Samuel	664 Walker Rd	987-2504	8"-9" of water in house in 97'; 99' to heat ducts, insulation was ruined
Tim D'Acci	PO Box 47600	407-6796	Department of Ecology representative
Jerry Theal	37 Walker Bottom Rd	987-2382	4' in garage in 99'; lived there 45 years; believes that flooding has been made worse due to provisions on mining gravel; also believes that culvert has made flooding problem worse; he has historic aerial photos of area (from DNR)
Jean & Barbara Baker	48 Tuplips Rd	532-5948	live next to lower Humptulips (since 30's); always have had flooding, but believe that the last 10 years have been unusually high
Sunny Kopstad	PO Box 124	987-2424	Walker Road, no loss, but high flooding
Eric Kopstad	684 Walker Rd		Highest part of Walker Road, no water in barn, resident since 77', 99' was highest water has been since 36' (per neighbor)
Larry Paull	48 Humptulips Valley Rd	532-8313	flooding is getting worse
Kathy & Mike DeBorde	654 Walker Rd	987-2420	2.5' of water
Joe Admyers	647 Walker Rd	987-2477	water got into barn, within 10" of new home, river has changed in last 10 years

## Grays Harbor Comprehensive Flood Hazard Management Plan: Public Meeting 1B

ATTENDEES: See Attachment A  
FROM: Andrea Escame-Hedger  
DATE: October 17, 2000

### AGENDA: 10/3/00

- I. Introductions
- II. Goals for today
- III. Goals for project
- IV. Scope and schedule of project
- V. Understanding of flooding problems to date
- VI. Understanding funding sources
- VII. Small group discussion of flooding problems
- VIII. Report issues to group
- IX. Group discussion of conclusions and future actions

### MEETING DESCRIPTION

Lee Hansmann began the meeting by briefly introducing the project and its purpose. She explained the other flood hazard management projects that have previously been done within the County and described the current projects that are being developed along the Chehalis River. She explained the County's, CH2M Hill's, and the citizens role in the development of this plan. Lastly, she introduced Andrea Escame-Hedger, project manager for CH2M Hill.

Andrea described the purpose of the project and agenda for the meeting. She then asked each citizen to introduce themselves and state which area they were interested in. The problem areas that were identified are included in attachment B.

Andrea proceeded to explain the goals for today and goals for the project. She asked the citizens to provide comment on the goals for the project and explained that they were dynamic goals and will be refined as we proceed with the project. No one expressed concern about the goals, but Andrea explained that we would revisit them in the next meeting.

Andrea then explained the scope and schedule of the project and the components of a comprehensive plan. She explained that although this is a County-wide plan we will be focusing on the Wynoochee, Humptulips, and Satsop rivers. She explained that previous

flood hazard studies have been done in North Beach, S. Coastal, Grayland, and Vance Creek. Areas of flooding as the County understands them were described.

A description of the goals for next meeting was presented.

Karin Frinell-Hanrahan, Deputy Director Emergency Manager was introduced and she explained that this project would not be implemented by this coming rainy season. She explained the role of the emergency management office, and passed out literature regarding their program.

Lastly, the group was asked to divide into smaller groups to mark up maps of their communities. The maps were of previously known flooding areas. The maps included communities located along the Wynoochee and Satsop Rivers, and the whole county. They were asked to identify the problem area, type of flooding and when it occurred; causes of flooding, and the name of a contact person. County and CH2M Hill representatives worked with the citizens to describe the problem areas and mark up the maps. These mark ups will be converted into an ARC VIEW coverage and will be included in the plan.

It appeared that the majority of citizens did participate in this process.

## OTHER COMMENTS

Below is a list of additional comments that were mentioned.

Matzer Road: The river gauge washed out and has not been replaced.

Who authorized dam conversion? Dam should be for flood control. Work on Chehalis/(I-5) Lewis County dike/dam also needs to be stopped. Dam originally permitted for flood control.

Meeting about dam operation and regulatory agencies is to be hosted by COE in October/November.

Who authorized selling Tacoma power. (Aberdeen sold to Tacoma.) Dam would be drained down to nothing in October before power generation. Why can't County go to court to stop dike in Chehalis?

One resident said quick answer is to stop and have Grays Harbor County sue Tacoma Light from using dam for generating electricity.

NOAA radio was wiped out in flood.

There was a question to Kevin Varness regarding the status of solutions in other areas that have been studied. Kevin explained that other areas within the County have been studied and that projects have been identified, but the projects are costly and will be done after there is financing for them. To date, some small fixes have been done.

Need override of Endangered Species Act. His group will file lawsuit against Ecology if it can't dredge and clean out rivers.

Need to mention Cloquallum (sub)basin.

Let people on river to work for free – pull out snags, remove gravel. Maintenance of river should be allowed.

Telephone system will be tested in October.

Gravel transport (Planning Department) greater than allocation.

Residents may have video of flood (Brady bottoms area and Wynoochee).



**ATTACHMENT B**  
**Wynoochee, Satsop and other Areas**  
**Problem Identification**

Location	Issue
Dave Palmer 7475 SR 12, Oakville, 273-8117	County-wide issues; Black River (\$60,000 in damages). What is the plan?
Mary Eng Central Park at 606 Solki Road 537-7150	Flooding in basement.
Ed Aulds 2631 Aberdeen Ave., Hoquiam	Attended meeting to learn of issues.
Steve Issacson 178 Elma - McCleary Road Elma, 482-4603	Wildcat Creek is undermining house and deck. No emergency assistance until house is in the creek.
Nancy Sarrafon 668 Monte Elma Rd, Brady 249-6039 668 Monte-Elma Road	18 in of water in house when it flooded in December '99.
Carolyn Fitzgerald, ACOE, Seattle 206-764-3591	
Tom Murphy, ACOE, Seattle 206-764-6560	Wynoochee Dam
Steve Willis 16 Willis Road, 249-2826	River bank erosion is a problem. Gravel mining.
Norman Willis 77 Willis Road, 249-4646	Erosion is the problem. Gravel build up decreases flow. Remove gravel from strategic areas.
George Daubert 655 Monte-Elma Road 249-3263	In 5 years, flooded 3 times due to dam. \$250,000 in damages reported to FEMA. About 9 ½ ft of water in house; raised it 6 ft.
Larry Willis or Terry Willis	There is mismanagement of rivers.
Larry Willis 22 Willis Road, Monte, 249-6206	The Fire Department has been involved in rescue over the last 4 to 5 years. Has same concerns as other Willis Road residents.
Marcie Bower 125 Fern Lane, Monte, 249-0074	Access would be lost if flooded.
Sue Stone 1973 Wynoochee Valley Road 249-5565	Lost fences two years in a row. Lost bank due to erosion. Doesn't think Satsop and Humptulips are in the same class as Wynoochee which is controlled.

Terry Willis 83 Willis Road, Monte 249-5386	Erosion is the major problem. Lost lots of soil down the river; lost 10 acres of 20-ft deep land/soil. Gravel in river beds is an issue. Easily floods in this area. <i>Hiram Hall Road culvert s removed, created dip=loss of access.</i>
JoAnn Schaffer 158 Geissler Road, Monte 249-1042	Dam conversion changed the amount of water stored. There is mismanagement of dam. Created a considerable amount of soil loss in 1997. County diked flood way on Geissler Road (92' x 6' going through 4' x 4' culvert). DOT removed cause way and replaced with 4 ft culvert.
Dan Ayres 119 Brady Loop Road, Monte 249-5291	Flooding in basement, but in last three to four years flooding has increased. Threat required need to leave house for safety. First 12 yrs, minor flooding in basement; last 3 yrs, serious flow. Wynoochee backup.
Duncan Stone 1975 Wynoochee Valley Road 249-5565	Two major floods. Lost a considerable amount of land and fencing.
Gary Latzring 111 Wynoochee Valley Road 249-3355	Flooded first in 1997, then again in 1998. Back water from Highway 12 from 1985 to 1997. Flood in 1997 involved losses.
Stormy Glick 388 E. Satsop Road, 482-5757	Farm land flooded. Lost land and animals. Flooding started in 1995. No flooding in 21 years prior to 1995.
Helen Lake 135 S. Division, Elma (PO BOX 150, McCleary, 98557) 495-3265	Vance Creek Park overflow has caused flooding for the past 8 to 9 years. It's runoff water from Elma (from everybody. Bank = asphalt).
Roger Boardman 179 Arland Road, Monte 249-5231	Flooding of Chehalis. Problems due to dam mismanagement – insufficient storage. "Power making" created the problem.
Dixie Hupp 111 Brady Loop Road E. 249-3835	1968 freeway construction obstructed natural flow; 1968 is when she first had water in basement. Problem is the Wynoochee dam; it has flooded three times. Rivers are flat now.
Jim Borden 505 E. Satsop Road, Elma 482-3284	Same flooding issues. Gravel is a problem; it's filling up Satsop River – 16" to 18" on roadway overflow channel; can't maintain now?
Purtill 25 Allen Road, Elma, 482-4017	Flooded house once; also flooded property in the last 3 of 4 years.
1 mile east of Satsop 56 Newman Creek Road?	Deep ditches overflow – 6 in of water in house. Raised house 2 ft.
Diane Pinger 43 Geissler Road, Monte 249-5479	Geissler Road culvert is a problem. One hour notice is not enough time to get out. Lost mushroom growing business.
Dan Carson 1977 Wynoochee Valley Road 249-3994	Displaced salmon left in fields after floods; inconvenienced by floods.

Jim Andrews 178 Arland Rd, Monte (188 acres) 249-3610	Flooding; 1 ½ hrs is not enough warning to evacuate livestock (20 horses) and people. Flooding is fast. \$20,000 lost. Prior to power plant there was no flooding. Dam should be controlled better. Release water better. Erosion is a problem.
Joe Swenson 534 Wenzel Slough Road, Elma 482-3953	Need to dig out (dredge) river, but can't get OK from DOE. "Satsop, Cloquallum, Wynoochee = beautiful waterfront property."
Mike Pierce or Ferris Wenzel Slough Road	Flood danger needs to be reflected in tax assessment.
Pat Lofgren 48 Cascade Drive n/o Brady Store, Monte, 249-5623	Lost access. Wynoochee also affects Satsop. Dirt and silt are problems.
Sherry Rudrull Middle Branch of Newman Creek 173 Newman Med Br, Elma, 482- 2094	Access blocked for days from Creek. Fields were flooded. Wynoochee affects Satsop.
Tracy Caisone 154 Middle Satsop Road, Monte 249-6530	Half-mile along river. Lost land, animals, fencing to river; house has not flooded. People are concerned about threat of flooding. Too much silt and gravel in river.
Cascade Lane/Drive	First flood occurred five years ago and it has continued every since. "Everybody knows (problem), but where is County and COE?" Bottom of river is higher.
W. Satsop Road 60 acres	Bank erosion. Most of property hasn't flooded, but is designated floodplain. Culvert not adequate to handle flow.
Claudia Beckwith 272 SR 107 (by bridge) (PO Box 527, Montesano, 249- 6610)	Water rises 10 ft in an hour when released from dam. Lost 2 animals one year. House flooded. School bus almost covered in an hour. Dam water is released without warning. Then no tax relief.
Wayne Nelson 272 SR 107, Monte 249-2032	<i>Comments similar to Claudia Beckwith above. In December of 1999, had 4 ft of water in barn. Purchased property from Beckwith.</i>
Ron Mullins 289 Minkler Road, Monte 249-3047	Chehalis project will effect downstream residents. Cloquallum property. DOT culvert diverted water to his site. Cloquallum is full of gravel. Problems with overpass/culverts. Dike project in Chehalis will affect them downstream.

## Grays Harbor County Flood Hazard Management Plan - Public Meeting - Montesano, WA 1-29-01

FROM: Andrea Escame-Hedger

DATE: February 7, 2001

### AGENDA: 1/29/01

- I. Introductions
- II. Overview of the plan
- III. Progress to date
- IV. Preliminary recommendations
- V. Comments/Feedback
- VI. Individual questions in small groups

### MEETING DESCRIPTION

Agendas and a questionnaire were passed out to residents. The questionnaire is summarized in attachment A.

Lee Hansmann began the meeting by briefly re-introducing the project and its purpose. She explained that this was the second set up public meetings conducted as part of the public involvement process. Lastly, she re-introduced the CH2M Hill project team.

Andrea described the purpose of the project and agenda for the meeting. The main purpose of the meeting was to present the conceptual recommendations for flood hazard management projects and to obtain citizen feedback. The presentation (see Attachment B) included an overview of the plan, plan goals, watershed conditions, watershed topography, progress to date, problem identification, regulatory recommendations, cost and funding, and schedule.

### PUBLIC COMMENTS

At the end of the presentation, the residents were asked to comment about any issues they had with the plan and recommendations. A detailed list of comments is included in attachment C. The main concerns expressed by the residents included the following:

- Inclusion of residents and adequate notification- Many citizens expressed concern that more people should have been invited to the meeting and that notification was inadequate. Lee Hansmann explained that citizens who were on a repetitive loss list were contacted and that the meeting was advertised in the newspaper. She also told them to share this information with their neighbors and to contact her if they would like to be added to the list for future meetings.

- Gravel removal-Numerous residents expressed concern that gravel removal was not presented as a recommendation. They also did not understand why it was not allowed. It was explained that gravel removal would be difficult to permit because of fisheries issues, but that this question would be asked at an upcoming meeting with the Washington Department of Fisheries (WDFW). A summary of this meeting will be sent to residents. In addition, names of people interested in attending a meeting to discuss this issue with WDFW were collected.

Area 4. Photo does not accurately depict where Satsop River is now.

Rip rap by gravel pits allowed in 70s so river couldn't get pits. Big high bank.

Can't take care of Satsop until take care of Chehalis. Dredge at least past mouth of Satsop river.

Elaine Hartford/ Below Tornan?? Bridge.

House floods – 40 to 50 feet from river. Bank erosion upstream causing silt. Need to dredge river.

#### Attendees:

Dan Ayres, 119 Brady Lp. Rd., Montesano 98563  
 Leo P. Bailey, P. O. Box 218, Satsop, 360 249-4480  
 Mr. and Mrs. Roger Boardman, 179 Arland Rd., Montesano 98563, 360 249-5231  
 Michael Bradrick, 25 Geissler, Rd., Montesano 98563, 360 249-2472  
 Tracy Cairone, 154 Middle Satsop Rd., 360 249-3915  
 Mr. and Mrs George Daubert, 655 Monte-Elma Rd., Montesano 98563, 360 249-3263  
 Lynda Calavar, 168 Satsop Riviera Lp., 360 482-5122  
 Dana A. Ferestien, 1922 33<sup>rd</sup> Ave., Seattle 98122, 206 233-2892  
 Stormy Glick, 383 E. Satsop Rd., Elma 98541, 360 482-5757  
 Elaine Hartford, 859 Monte-Elma Rd., Satsop, 360 482-4494  
 Karin Frenell Hanrahan, P. O. Box 630, Montesano 98563, 360 249-3911  
 Dixie and Lloyd Hupp, 111 Brady Lp. Rd., Montesano 98563, 360 249-3835  
 Fred Hutchison, 775 Cloquallum Rd., Elma 98541, 360 482-4079  
 Toni Landert, 425 Chenan, Hoquiam 98550, 360 533-5578

Gary D. Letering, 111 Wynooche Valley Rd., Montesano 98563, 360 249-3355  
Maxine McCormack, 237 Satsop Riviera Lp., Elma 98541, 360 482-4224  
Dan Modrich, 17 Homestead Ln., Elma 98541; 642 Newskah Rd., Aberdeen, 360 533-3050  
Kerri Neathery, 90 Wheeler Rd., Montesano 98563, 360 249-4334  
Mike Pierce, 470 Wenzel Slough Rd., Elma 98541, 360 482-6068  
Sherry Rudrud, 173 Newman Middle Branch, Elma 98541  
Mr. and Mrs. M. Schoch, 55 W. Wynooche Valley Rd., Montesano 98563, 360 249-3624  
Darrell Scrimgeour, 75 Homestead Ln., Elma 98541, 360 482-3863  
Owen Shaffner, 158 Geissler Rd., Montesano 98563, 360 249-1042  
Laura Schinnell, Energy Northwest, P. O. Box 1223, Elma 98541, 360 482-1586  
Dan Schoch, 106 W. Wynooche Rd., Montesano 98563, 360 249-6111  
Rex B. Valentine, 144 Hurd Rd., Elma 98541, 360 482-2062 or 470-0750  
Larry Willis, 22 Willis Rd., Montesano 98563, 360 249-6206  
Lester Willis, 22 Willis Rd., Montesano 98563, 360 249-4349  
Rachel Zeigler, 32 Matson Rd., Montesano 98563, 360 249-3895

## ATTACHMENT C

Below is a list of additional comments that were discussed at the end of the meeting.

Where are the watersheds? (Public education/information idea)

Response: The watersheds were pointed out on the maps within the room.

Dredge river to alleviate flooding, better for fish.

Remove gravel, log debris, etc. to deepen channels; better for fish habitat.

Dredging previously mentioned, but not included in alternatives.

I want the report to incorporate our comments.

Response: The report will include the minutes from this meeting.

Why can't community dredge rivers? – Can WDFW answer?

Fisheries Department says no dredging. I want gravel removal listed as an idea.

Ask fisheries, why can't we dredge the rivers? Because of fish – is it spawning?

Why comment this (gravel removal) should be done, when it does not show up?

Grays Harbor (GH): Revetment will direct and deepen channel.

We are just going to do it ourselves, because they want action.

Wynoochee owners want dam operations changed.

Response: Army Corp of Engineers (ACOE) is conducting another study on the Chehalis basin. They have committed to investigate dam operations during flooding events.

Satsop owners want river dredged.

Why/how will dredging affect fish? Ask Fisheries, get answer?

Satsop River: Gravel removal was restricted because no gravel was coming downstream.

Dan Sokol, Department of Ecology (DOE): It's not a simple issue. Expensive to remove; must determine what to do with it (dredged material); maintenance is expensive and will encourage bank erosion. River needs gravel.

DOE: Whatcom County dredged Nooksak with bank stabilization.

Whatcom County dredged Nooksack, but big event filled it back in.

DOE: Pierce County doesn't need (to) mine for gravel, because they get it cheaper somewhere else.

Citizens know what to do.

Maintain river year to year for minimal impact - remove debris annually to allow fish passage. Fisheries has to listen.

Fish don't make it because habitat gets washed out. Need off-channel habitat for spawning.

Provide sloped bank with gravel on it; improve main channel, (have) off-stream habitat for spawning.

Ted Dolkowski: Wants something done about jet boats in Chehalis and Satsop Rivers. (This activity is) destroying baby salmon. Also take this issue to Fisheries.

Shoreline Management Act (SMA)- No riparian buffers - 21 of 39 counties filed an appeal.

SMA-Take to Ecology. Property owners are not giving up property either to vegetate or pay. Won't give to federal government.

Get notice of meeting out; nothing in newspaper. Get report of meeting in the newspaper.

Dredging - \$13 million/profit motives.

Roglins has a profit motive for dredging. People can do it cheaper.

People are concerned about flooding. As property owners, they feel like they know what to do about it. Use own equipment. Develop creative solutions. We the people can help flooding problem. We want to be part of solution.

It's not us versus them. Shouldn't have to hire someone to come in and do the work; think creatively.

GH: Plan is a living document.

Let individuals do the work (tractors, horses).

Alleviate government-imposed problems - at Highway 12 and Geisler Road - State and County (made a mistake) because engineers didn't listen to people. Include as a major bullet: You created problem, have plan. Help get things done.

Annual gravel use in County = 432 stories x football field. A lot of cubic yards.

Disagree with restricting building in floodplain. So difficult to build a shed to cover hay.

DOE: Need flood insurance for those who live in floodplain. 3,000 policies in GHC (11% of state).

FEMA and regular insurance for living in floodplain gets expensive.

GH: There are new companies now underwriting, but much more expensive.



Ecology: Good reason to revise FEMA mapping. FEMA maps are inaccurate – and difficult to correct. Expensive to override maps or go through the revision process (surveying).

FEMA Insurance. Continuous flooding zone. Raised house 6 feet; has taken a year to get paperwork through FEMA to get rate lowered.

Grant for raising their house \$15K. County would not sign the papers. They said: 1) move it; 2) sell it; 3) live in it.

Home elevation certification not signed by County to get insurance grant.

When freeway was constructed through Elma, big culverts were installed. Now River backs in and floods lower part of town, houses and school grounds – from 12<sup>th</sup> to Division – three feet higher than before.

What about building structures on top of levees? Could be used as easements.

Response: They are not designed for this type of land use. It would degrade integrity of levee.

Setback levee – plan – will there be any specific design guidelines? If land was pasture could it still be a pasture?

Can you build homes on setback levee? Answer: Degrade integrity of levee.

Ecology, along with other agencies, pitched in money for Puyallup River for setback levee. Money can't be spent on forcing people to move. Buy outs. (Ecology can't force.)

Plan Schedule:

Draft goes to agencies and then there is public comment.

What happens after Final Draft?

What if County doesn't get money for implementation?

GH: FCAAP grant. County is requesting. Corps is proceeding on Chehalis Basin Study. Trying to obtain more funding to carry out analysis (ACOE in separate project on Chehalis) so essentially if no money could (get) shut down.

GH: Must have the documentation (this plan) to apply for funding.

Concern about drafting plan by May 31, because of the dam issue. Corps decision (Wynoochee) could affect the plan.

How do we ensure Corps includes the Satsop?

Slow process, got worse in 80s – wet and dry cycles

GH: Be patient and persistent. Need to know community support. What is decided – like dredging – then we can go through long process with agencies.

Who has final say? Ecology, NMFS, Corps?

Have a meeting with the agency; invite representative from each to participate in group process.

Make a copy of the plan available. Can specific sections (proposals, recommendations) be made available? Copy participants on problems and conceptual solutions.

Response: A complete plan will be available at the County office. Executive summaries describing problems and conceptual recommendations will be sent to citizens for comment. A meeting will be conducted in April to describe the draft plan.

How can we make sure it's a priority? How can we find out about these meetings, i.e., Wynoochee meeting.

Fear is that money going to consultants and we're not getting anywhere. Afraid Satsop is getting lost.

Response: Will not get FEMA funds if there is no plan. Plan opens door for us.

GH: You must be pro-active.

Satsop should be included – dam affects them too. Satsop residents should be included in all Wynoochee meetings. No adequate notice of these meetings. Make complete list of all riparian owners.

Funding: Make big cement blocks from gravel to use instead of big rocks at Westport.

There isn't a complete list and there should be. It should be every riparian area.

Who has final say? Can Fisheries say no?

Invite NMFS to these meetings.

Keep motorboats and jet boats out of river.

Why does NMFS have so much power? Can we have opportunity to comment on draft; get draft of report or meaningful part; executive summary perhaps.

Is there going to be another meeting?

The plan schedule was described. In addition, Andrea committed to send letter on results of meeting with Fisheries.

## Grays Harbor County Flood Hazard Management Plan - Public Meeting - Humptulips, WA 1-30-01

FROM: Andrea Escame-Hedger

DATE: February 7, 2001

Following are comments made by attendees at a public Meeting on the Grays Harbor County Flood Hazard Management Plan conducted in Humptulips, Washington, on Tuesday, January 30, 2001.

Why did some areas have worse flooding in 1999 than in 1997?

Answer: Rainfall here was greater.

Why was gauge taken out?

Answer: USGS had budget cuts.

Is not having a gauge a problem in getting grants?

Answer: This condition does impact warnings, but probably does not affect grants. Gauge costs \$15,000 to \$30,000 (annually?) plus maintenance.

Are we asking for a gauge to be put in?

Answer: Yes. We've asked every time funding cycle comes up.

This would allow for flow data collection to use in future analysis and flood warning system.

No regulations that prohibit rebuilding after fire or natural disaster.

FEMA mapping: FEMA has a new cooperating communities program to help develop updated mapping.

Have we asked Congressman for help?

Answer: Don't know, but it is a good time as USGS got supplemental money.

Why are Satsop data shown?

Answer: Humptulips data not available. Satsop probably a close comparison.

Do peaks correlate to rainfall? Is primary cause increased rainfall?

Answer: Yes

Dan Wood's concern: Can't do anything about weather with regulations - "raised hairs."  
Land use does impact flood.

Are you finding examples of non-compliance?

Answer: Look at variances.

If your home is surrounded by water, are you living in a wetland?

Answer: Probably not; it depends on soils and vegetation and water.

Dan Wood's concern is (wording in) report. If saying a recommendation is to enforce, then the logical inference is that Grays Harbor County is doing (something) wrong. Could report say "continue enforcement?" Important to note that Grays Harbor County is enforcing and is not allowing filling of wetlands.

FEMA map elevations. Is this the area where it is 0? If 40 and built at 38, yes.

Clarify that current codes are enforced and should be continued.

Comment: Humptulips' dike is slowly settling. Dike hasn't had any real work for many years. It needs work all along dike. When low point washed out, County did put on some rock.

Comment: It would help if the newspaper would talk about Humptulips flooding. Humptulips never gets attention! Never report Humptulips flooding. Other Grays Harbor County rivers receive media coverage.

Dan Wood: Would setback levees be allowed under the new SMA guidelines? Would two-year update window be enough to permit some of these projects? How difficult would this regulatory process be?

Answer: Follow regulatory process.

Walker Bottom Road: As far back as '86 or '87, every two years, families would remove gravel. Now flooding is worse than ever before. It's expanding into new areas. Even after gravel bar mining, there are still fish.

Dan Wood: WDFW meeting should reinforce idea of removal of gravel for flood control only, not for profit or commercial uses.

Shoreline rules?

Answer: Wait until shake out.

We have two years from 12/29 to do something if new rules stick. Is that enough time?

Answer: It would be difficult.

Comment: Against law to remove gravel now, but (we) used to and didn't have flooding. Lower Humptulips will be safer if we could remove gravel.

Where is Grays Harbor County on community rating?

Answer: Probably a nine. Could potentially be lower.

Comment: We are still going to have the water.

Comment: Every two years or so, people took turns mining gravel so river stayed where it belonged.

Comment: River is now roaring – not a mud puddle. In front, up to waist. We are at a total loss when there. Lost skirting. Have to do flood proofing again.

When gravel mining – there were always fish. Just push it back a little. Been there 55 years. Last time was hairy.

Dan Wood: Mining implies commercial, but that isn't what we're after. Perhaps define "mining." Maybe use another term that implies flood control rather than commercial connotation.

Moody Road. Trenched bar which reduced bank erosion.

Comment: Gravel bar build \_\_\_\_\_ let water – allowed it out to prevent erosion of banks.

Gravel bar removal: When actively pursued, there was less flooding and erosion. Lower Humptulips would be safer.

Comment: fish more important than human beings.

Map?

Baker's would flood worse if dike repaired. Need to make sure water gets out.

Don't shorten bridges.

Knock railroad out (they own now). County wouldn't like that because road would be flooded.

Without flood insurance, rely on disaster assistance = \$13,000.

Community Rating. Currently 10. Arrange meeting with FEMA rep through Dan Sokol.

To Ecology: Why is flood insurance so high?

Answer: Depends on where you are, how high.

**Attendees:**

Bill Dineen, 1314 Ocean Beach Rd., Hoquiam 98550, 360 533-1796

Jean and Barbara Baker, 48 Tulips Rd., Hoquiam 98550, 360 532-5948

Karin Frenell Hanrahan, P. O. Box 630, Montesano 98563, 360 249-3911

Jim W. Wells, 274 Kirkpatrick Rd., Hoquiam 98550, 360 289-3530

Lanny and Judy Thomas, 547 Walker Rd., Hoquiam 98550, 360 987-2379

Dan Wood, 2323 Aberdeen Ave., Hoquiam 98550, 360 538-7479

Teena Butterfield, 562 Walker Rd., Hoquiam 98550, 360 987-0027

Arla Samual, 664 Walker Rd., Hoquiam 98550, 360 987-2504

Citizen Input - January 2001  
 Grays Harbor County CFHMP Project  
 Montesano 1/29/2001  
 Humptulips 1/30/2001

No.	Citizen Name	Address	Phone	Property Acquisition	Assist in Flood Watch Activities	Willingness to Invest to Improve Flood Status	Materials Required	Location of Meeting Attended
1	Jean and Barbara Baker	48 Tulips Road, Hoquiam 98550	360 532-5948	Y	N	Would have to know the details	Maps	Humptulips
2	Roger Boardman	179 Arland Rd., Montesano 98563	360 249-5231	N	N	N		Montesano
3	Michael C. Bradrick	25 Geissler Rd., Montesano 98563	360 249-2472	N	Y	The major concerns we have were created by county or state engineering departments.	Floodplain maps.	Montesano
4	Lynda Calavar	168 Satsop Riviera Lp., Elma 98541	360 482-5122	N	Y	N. We are retired.		Montesano
5	George and Grace Daubert	655 Monte-Elma Rd., Montesano 98563	360 249-3263	Y	Y	N. We have already put all our money into our home.	Brochures, explanation of permit processes, floodplain maps. Action.	Montesano
6	Bill Dineen	1314 Ocean Beach Rd., Hoquiam 98550	360 533-1796	N	Y	Y	Maps	Humptulips
7	Stormy Glick	383 E. Satsop Rd., Elma 98541	360 482-5757	N	N. Have 3 full-time jobs	Y. I own one+ miles of the Satsop. I would mine and/or dredge my 1.5 miles of river at my expense. I would consider other projects also.	Don't need any brochures. Excavators, dump trucks, drag lines - that's what would cure flooding.	Montesano
8	Lloyd and Dixie Hupp	111 Brady Lp. Rd. East, Montesano 98563	360 249-3835	Y	Y	?	A flood plan. Restriction on releases from dam.	Montesano
9	Gary D. Letering	111 Wynooche Valley Rd., Montesano 98563	360 249-3355	N	Y	N. Not when the flooding is caused by others.	A true flood study of our basin.	Montesano
10	Maxine McCormack	237 Satsop Riviera Lp., Elma 98541	360 482-4224	?	Y	No. Am on a fixed income that doesn't let me.	?	Montesano
11	Mike Pierce	470 Wenzel Slough Rd., Elma 98541	360 482-6068	N	Y	I pay Federal, state and local taxes. This meeting is an example of how some of my tax money is being used. Use some more of my tax money to mitigate these flooding issues.	Floodplain maps specific to my property location	Montesano
12	Sherry Rudrud	173 Newman Middle Branch, Elma 98541						Montesano
13	Arla Samuel, John Samuel	664 Walker Rd., Hoquiam 98550	360 987-2504	Y	Y. If we are home.	N.	"Nothing is going to help."	Humptulips
14	Laura Schinnell, Energy Northwest	P. O. Box 1223, Elma 98591	360 482-1586	N	Y	Yes. Depending on the cost sharing formula and other grant money. The Satsop Development Park may be interested for the raw water well, Ranney wells and barge slip.	Education brochures may help people understand historical records; how complex an issue this is.	Montesano
15	Dan Schoch	106 W. Wynooche Rd.	360 249-6111	Y	N	N	Explanation of permit processes, floodplain maps.	Montesano
16	M. Schoch	55 W. Wynooche Valley Rd., Montesano 98563	360 249-3624	Y	N	N		Montesano
17	Darrell Scrimgeour	75 Homestead Ln., Elma 98541; P. O. Box 257, Satsop	360 482-3863	Y. Have river front and stream on Satsop.	Y. Very interested.	Undecided. Dredge river gravel, lets river out; make huge cement blocks and put in Westport bar channel as dike.	Want to know why rules aren't enforced equally.	Montesano

Citizen Input - January 2001  
 Grays Harbor County CFHMP Project  
 Montesano 1/29/2001  
 Humptulips 1/30/2001

No.	Name	Address	Phone	Property Acquisition	Assist in Flood Watch Activities	Willingness to Invest to Improve Flood Status	Materials Required	Location of Meeting Attended
18	Owen Shaffner	158 Geisler Rd., Montesano 98563	360 249-1042	N	Y	Depends.	We need to educate our governments - the City of Tacoma, Grays Harbor County, Washington State Department of Ecology - regarding shallow rivers (because of the accumulation of gravel) is causing our flooding.	Montesano
19	Lanny and Judy Thomas	547 Walker Road, Hoquiam 98550	360 987-2379	Y	Y. If we are home.	N	Maps of area, brochure on floodplain.	Humptulips
20	Rex B. Valentine	144 Hurd Rd., Elma 98541	360 482-2062; 360 470-0750	Y	Y	Yes. To a limited amount.	Revised maps that are accurate, showing the flood areas.	Montesano
21	Jim Wells	274 Kirkpatrick Rd., Hoquiam 98550	360 289-3530	N	N. Have 300 acres that flood.	N. My home is high and dry.	I don't know.	Humptulips
22	Larry Willis	22 Willis Rd., Montesano 98563	360 249-6206					Montesano
23	Lester Willis	22 Willis Rd., Montesano 98563	360 249-4349	N	Y. Have Davis WX Equipment plus other equipment.	Yes.	Need maps from other surveys from past. Aerial photos of rivers since started. River level of gravel bottoms. All possible history of past dredging.	Montesano



To Grays Harbor County State of Wa.

M. Josephine Schoch  
55 Wynooche Hwy. Kd.  
Wilton, Wa. 98563  
May 22, 2001

RE: Letter from Dept. of Public Service 5-9-2001  
Flood Hazard Management Plan

The flood problem in the Wynooche Tracts area is now a big problem not just a sob story that will be managed. This is a problem that was caused from poor management at the "switch" where the water could have been controlled and managed. You may recall the DAM was put in for that purpose TO CONTROL THE WATER FLOW IN THE RIVER. (WYNOOCHE RIVER)

Now what?  
These floods have destroyed our retirement plans.

We since 1960 as a family have worked long and hard from day one paying taxes on our WYNOOCHE TRACTS property thinking and setting out for the future with the goal in mind of a good retirement for ourselves and also our 3 children. This property was and still is our life & soul.

We can not afford to lose anymore rites, property and moneys to correct the errors someone else makes.

Another big problem is the small culvert under  
Route 17 which created a little more. So also

flow of the water.

If you will study the old Sand Box  
tactics it may help you to see the  
problem is, the water cant get out  
of the bottle fast enough. which in  
this case points to the culvert.

"THINK"

Sincerely,

Mr. & Mrs. M. Schoch

Montesano, WA.98563-  
May, 18 01

MS: Lee Hansmann:  
Grays Harbor County

I'M responseing to the notice in the paper,also the letter we received from you refer  
FLOOD CONTROL the rivers in Grays Harbor,or the LACK of CONTROLbecause of Grays  
Harbor County Commissioners, the Rivers, Dam and the CORPS,and when the County had  
THE MONEY FOR THE FLOOD CONTROL MANAGEMENT years ago and used the  
money for thier other projects.

If the money was used for the flood control, we wouldn't have had all the damage we  
did, and we,my Wife and I would have received funds from our insurance company for  
raising our home years ago .

GEORGE & GRACE DAUBERT  
655 Monte-Elma RD.  
Montesano, WA. 98563-9323  
(360) 249-3263

## **"A Treatise on Rivers, Salmon, and Farms"**

By Rex Valentine

The goals of the professional Environmentalists when describing how we should "save our salmon" have been stated as follows:

1. Keep the water temperature as low as possible.
2. Have maximum shade along stream banks from trees.
3. Keep silt and soil out of the water to help fish gills work properly.
4. Promote deep holes for salmon to hide in and rest during migration.
5. Disturb the spawning beds as little as possible.
6. Protect the fingerlings.

Up to approximately 30 years ago the farmers and loggers were pretty much responsible for achieving those results stated above, because no one else cared, and because each owner protected his own farm or timberland. We had three or four state fish and game wardens who oversaw the whole program, working out of their homes. The farmers and loggers took care, for the most part, to keep the riverbanks stabilized and the creeks open. We had lots of fish.

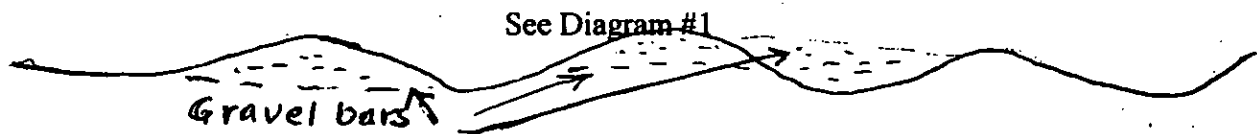
Then a huge bureaucracy began to build. The State began to hire many more "educated" people who were supposed to know how to care for our rivers. We were told, also, that the Federal Government was pressuring the states to get control of all the waters to "save the salmon". They insisted on having Shoreline Management Programs for each county, which outlined what they expected from us. I was appointed to Grays Harbor County's first Shorelines Board, and helped to write the Shorelines Management Act program. Having lived on both the Wynooche and Satsop rivers most of my life, I knew how to protect our lands and fish by stabilizing the riverbanks and bottoms. I was horrified at the regulations we were "forced" to enact. We were used to working with the Soil Conservation and Stabilization Board in Montesano, who helped us plan simple

/

projects to keep the riverbanks from eroding and washing away. This was supported by the Federal Government, first through the C.C.C. and then through these Soil Conservation men. They did a good job.

Now it was going to be different. The farmers and loggers were told that they were not to touch the riverbanks or clean out the creeks. They also were not allowed to gravel from their river bars without a permit (which many times were refused). Their cattle and horses were not supposed to drink out of the streams. It became very difficult to get a permit to build a bridge of any kind, or put in a culvert.

I state here without reservation, that these "expert environmentalists" have promoted and caused more salmon to die than anyone can imagine. I'll explain how: By not allowing landowners to stabilize their banks to keep the rivers in a gentle serpentine or winding course, just the opposite results have beset our rivers, farms, and fish from the six goals enumerated at the beginning of this treatise. Where once the water courses looked like this:



They now look like this.

See Diagram #2



The results of diagram #1 show and typify a stable unchanging bank, which allows the streambed to retain its depth, grow trees along the banks, remove gravel bars in the summer without disturbing the water, and keep the riverbanks from caving in. This results in saving fish and our best farm soil, and maintaining low water temperature.

The results of diagram #2 are fish killers, and land wreckers. The banks are constantly caving in with great gobs of soil during any freshet or high water. The river spreads out over a wide area, becoming very shallow, and running more slowly over as much as twice the area as before, while wiping out all the trees that might have grown

along the banks. The water temperature, of course, is higher because of these factors. This outcome defeats all six goals related on the first page of this report that the environmentalists are trying to achieve. It also promotes other problems:

- a. During high water the faster moving current cannot negotiate the sharper bends, and having a shallower streambed, it floods out over the fields and timberlands doing much damage. Lately it has flooded homes and barns that have never flooded before.
- b. It leaves the fish out in hay and cornfields where many fingerlings and larger fish are stranded and die.
- c. Much more silt is carried down to the Harbor and deposited where it must be dredged out at great cost to the taxpayer.
- d. The beautiful farms are losing their precious land, which has contributed, along with many other unnecessary regulations, to reduce Grays Harbor's dairies, beef and crop farms greatly from years past.
- e. Gravel, which could be removed from good stable bars, is now scattered all over.

The periodic removal of gravel from the river bars is essential for the following reasons.

1. Maintaining the channel depth thereby reducing flooding.
2. Helping to keep water temperature lower.
3. Giving the salmon deeper pools to hide and rest in.
4. Keep logjams and gravel ridges from forming which divert high waters into the banks causing serious erosion.

As a real plus the landowners will have a renewable source of income from gravel sales. Gravel in Grays Harbor County is in great demand. Much of the non-renewable pits have been mined extensively, so periodic "summer" removal of the ever-building gravel bars will not be injurious to the salmon spawning beds, and actually increase these spawning areas.

In caring for the small streams and creeks that are tributaries to the larger rivers, most landowners kept them open allowing cattle to drink easily. This also allowed salmon to go up them and spawn, laying their eggs in shallow gravelly areas. Small

stream maintenance also kept the water running freely, keeping the water from flooding the creek-bottom pastures.

When the environmentalists made the landowners leave those streams alone, trees fell across them, joins formed, and beavers dammed them up. They flooded pastures that were once productive, trees drowned from constantly standing in water, and the salmon could not get up the streams to spawn. From my observation it appears that as much as 15% of our spawning grounds are now lost. This loss is in addition to the loss of valuable trees and productive meadows.

While growing up on a dairy and beef farm in the upper Wynooche Valley in the 1930's and 1940's, there were mile and miles of hills and valleys without trees. They had all been slaughtered and the land had burned over with huge fires. You could see a cow a mile away on the next hill. The thoughtless early loggers left thousands of acres of barren land. But the early farmers cleared the good farmland in the fertile valleys, establishing many productive farms. Stable timber companies and small landowners realized that timber could be grown as a crop and began to plant acres and acres of trees in the 1940's and have done a marvelous job of re-establishing our forests and stabilizing the timber industry with sustained yields that should go on indefinitely. I planted trees for Simpson Timber Company in 1950 and 1951. Most of those trees have been harvested.

Along with clearing farms, building roads, planting and harvesting trees, many of these farmers and loggers loved the land and became our first conservationists and environmentalists. Even without many trees our streams were teeming with salmon. That second wave of settlers took much better care of the environment. It was where they worked and supported their families, and where they played when taking time off. They manicured their lands right down to the stable streams with pastures and woodlots. The salmon were plentiful.

The second wave of farmers and loggers did a great job with our natural resources. They controlled the streams without hurting the fish. There were many simple, inexpensive procedures used to stabilize the rivers. We need to reinstate these proven methods using log cribs filled with river rock, sloping banks 3 to 1 and bringing whole bars across the river and up on the banks, then planting willows in them to stop the

erosion. Some other procedures include building small rock jetties perfectly placed to veer the water away from an eroding bank, cabling in trees to break the current until the seedlings have been established, and finally, lining some banks with rip-rap rock.

These and other methods are natural ways to stabilize our streams along with our fish runs. The book-educated environmentalists need to team up with the time-tested conservationists of the land to create practical solutions to the saving of our salmon, our farms, and our forests.



Gary D. Letzring  
111 Wynoochee Valley Road  
Montesano, Washington 98563  
letzring@apexengineering.net

May 23, 2001

RE: COMPREHENSIVE FLOOD HAZARD MANAGEMENT PLAN

Lee Hansmann  
Deputy Director of Community Development  
Gray's Harbor County

Dear Ms. Hansmann:

My concerns and comments as written here relate directly to flooding of the Lower Wynoochee Valley, the area identified in the DRAFT Summery as "Wynoochee Tracts". I'm a Land Surveyor who has documented flood related data on the 1997 and 1999 flood events. I'm also an affected citizen in that, when the "Wynoochee Tracts" homes flood, so does our home.

The principle house, built in the late 1880's lies 1300+/- feet north of the westerly most home on Wynoochee Tracts Road (Carol Olsen). Our home was purchased from the original homesteading family, and had never flooded prior to 1997. In fact all of our homes fall outside a designated flood zone as identified on the FEMA flood map.

We began to see high water the winter of 1990. This is less than 2 years after W.S.D.O.T. removed the 205 foot Wynoochee Overflow Bridge and replaced it with a 7 foot diameter culvert. The winter of 1993 saw high waters again, but no damage to homes. Then, one night in March 1997, we awoke stranded on a small and shrinking island. Water where I thought and believed it would never come. I called for help and around 3:00 a.m. some brave volunteer firefighters, rescued my wife, our 2 labs and I by jet boat.

Before long, I had compiled enough survey data to start attacking the problem. The Wynoochee Tract's Residents and I hired an attorney, and by November 1999 we had filed suit against W.S.D.O.T. to fix the 7 foot culvert. 2 weeks later we flooded again. For a second, imagine 2 to 5 feet of water standing in your living room. Now, add to the water, petroleum products, raw sewage and critters. What would you have left? Our case is finally going to be heard in Gray's Harbor Superior Court this September.

In court we will be fighting for some of the very same goals the COMPREHENSIVE FLOOD HAZARD MANAGEMENT PLAN wishes to accomplish. It would be silly for Grays Harbor County to spend any of their funds on a project that realistically should be paid for by the party responsible for the problem.

But rather than forgetting about the Wynoochee Tracts flooding problems, I wish to encourage an addition to the COMPREHENSIVE FLOOD HAZARD MANAGEMENT PLAN by requesting that W.S.D.O.T. fix the flooding problem they have created. This would be a positive, inexpensive way to actually help achieve some of the COMPREHENSIVE FLOOD HAZARD MANAGEMENT PLAN comprehensive goals and eliminate the flood hazard we now face.

.....

May 23, 2001

Page 2

Some additional items that should be included in the summary:

"FLOODS" line 36, pg. 1-1: a) include the 1956 flood on the Wynoochee, this was the highest flood stage data recorded by the C.O.E. and prior to 1997 the largest flow. B) Add the 1935 event shown in the newspaper articles attached. This flood caused major flooding in the vicinity of Wynoochee Tracts.

"PREFERRED ALTERNATIVE" line 12, pg. 1-4: a) we need better evaluation of projects to insure they do not contribute to the flood problem areas. Possible peer review?

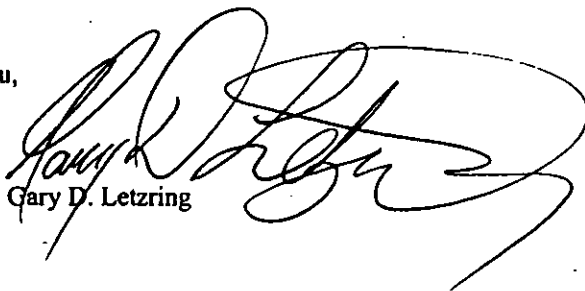
"STRUCTURAL MEASURES" line 39, pg. 1-5: another project to consider would be the east bank of the Wynoochee, opposite of N.W. Rocks West Wynoochee Pit. Approximately 1 mile upstream of HWY. 12.

Also elevating homes or buyout if needed is a better solution for the Wynoochee Tracts homes.

"CAPITAL PROJECTS" line 10 - 30+, pg. 1-6: the proposed earthen berm will place my 2 houses in the pond (backwater) created by the berm. I will not approve of such a plan. You should review some Supreme Court of Washington Rulings: CURENS vs. SLEEK, docket no. 66830-2 and HALVERSON vs. SKAGIT CO., docket no. 66171-5. Anyone who knows the topography around the Wynoochee Tracts homes should soon recognize that a berm would not work here. Think about drainage! Gray's Harbor County does not want to make the same mistake W.S.D.O.T. made.

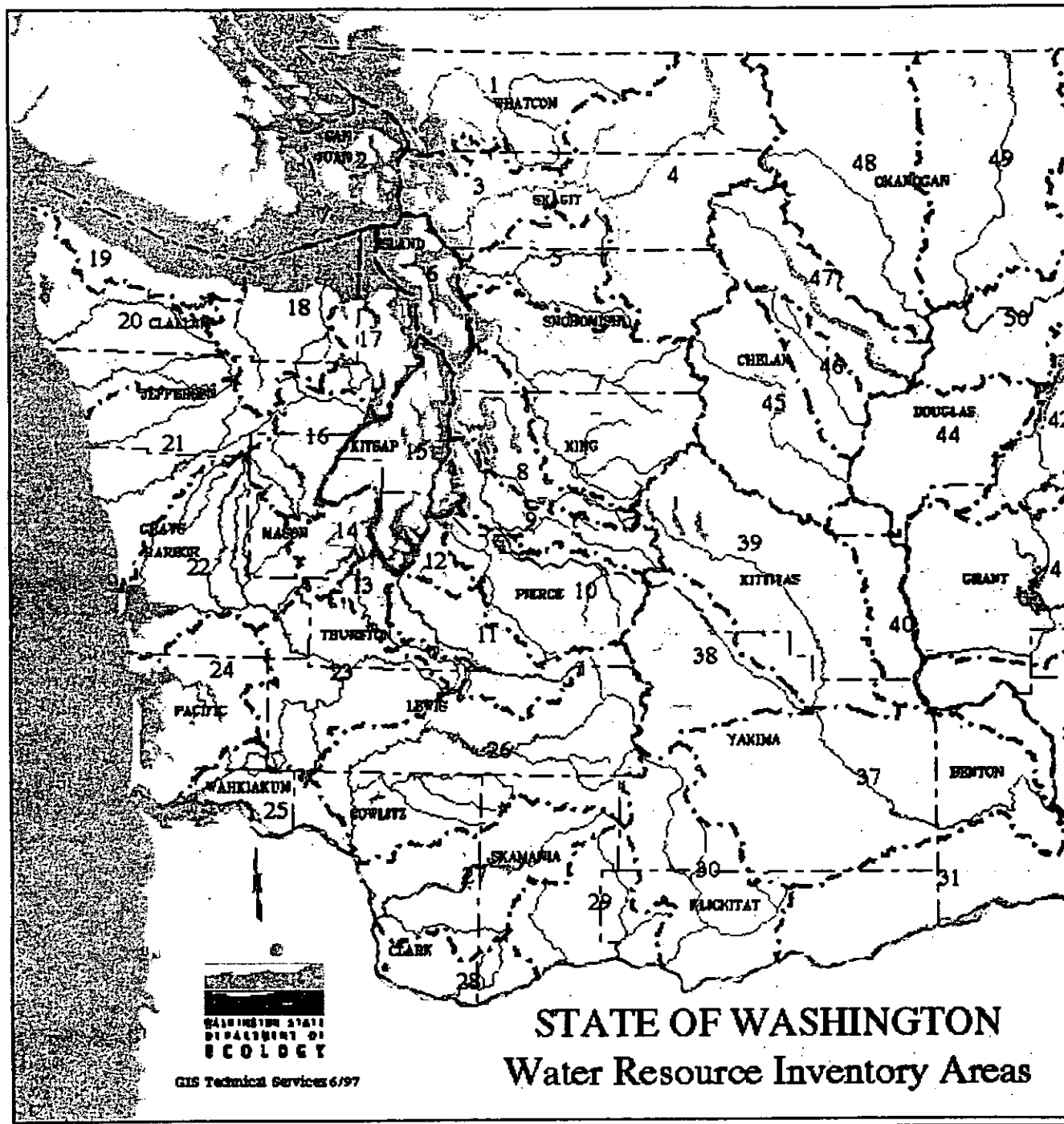
Ms. Hansmann, I hope that you will keep me informed as the summary progresses.

Thank you,

  
Gary D. Letzring

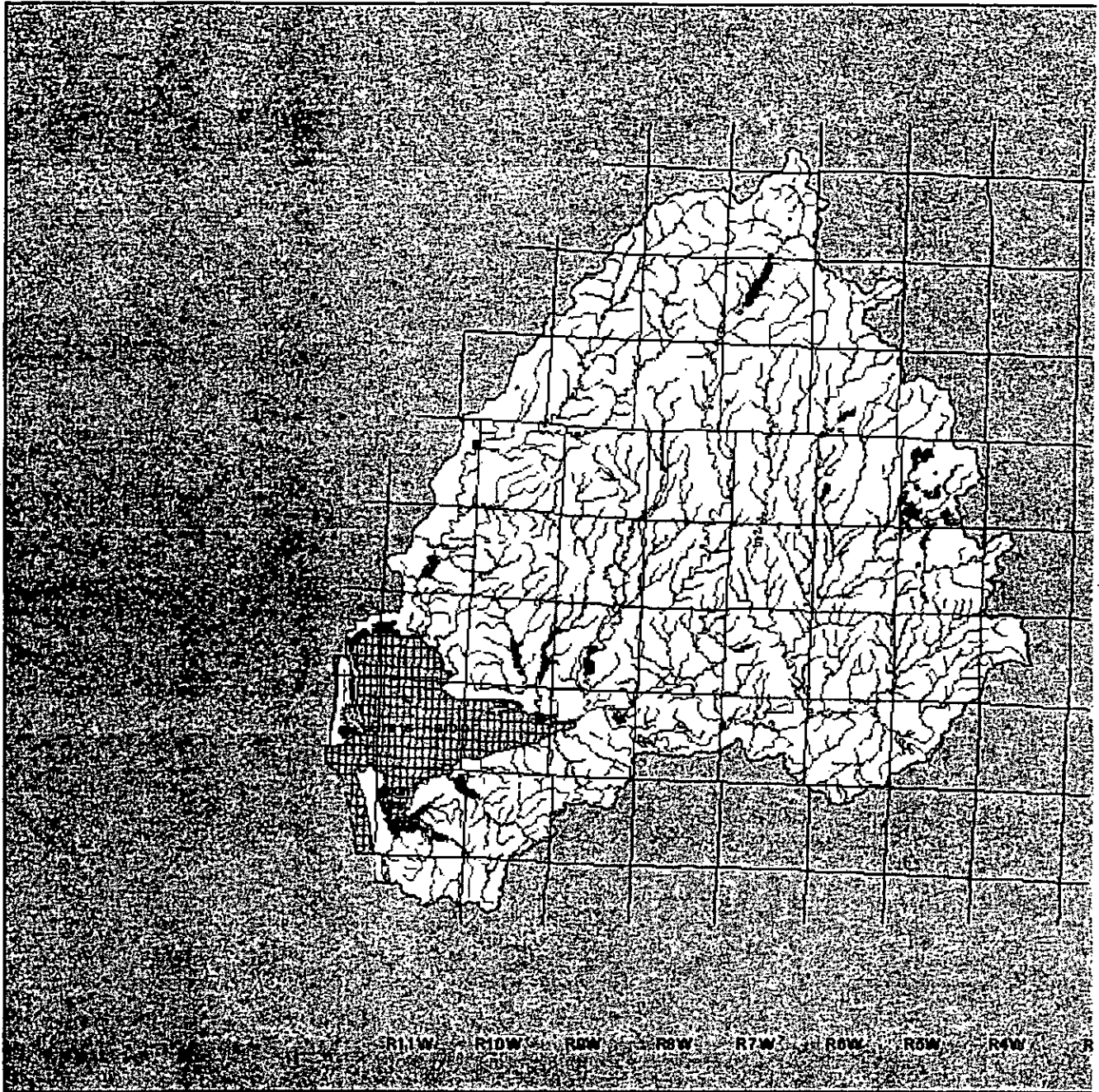
## **Appendix B**

### **Water Quality**



[Return to 303\(d\) page](#)

[Return to WRIA data page](#)



WRIA	Waterbody Name	Parameter	Township	Range	Section	Latitude	Longitude	New ID #	Old ID#
21	KALALOECH CREEK (W.F.)	Temperature	24N	13W	03			OE71LO	WA-21-3000
22	BLACK CREEK	Temperature	18N	07W	17			SC15QZ	WA-22-4025
22	CHEHALIS RIVER	Fecal Coliform	17N	07W	18			PB33WC	WA-22-4040
22	CHEHALIS RIVER	Temperature	17N	07W	18			PB33WC	WA-22-4040
22	GRAYS HARBOR (INNER)	Fecal Coliform				46.965	123.875	390KRD	WA-22-0030
22	GRAYS HARBOR (INNER)	Fecal Coliform	17N	09W	10			DS29ZH	WA-22-0030
22	GRAYS HARBOR (OUTER)	Fecal Coliform				46.865	124.045	390KRD	WA-22-0020
22	GRAYS HARBOR COUNTY DRAINAGE DITCH NO. 1 (GHCDD-1)	4,4'-DDD	15N	11W	06	0	0	AB55IV	None75
22	GRAYS HARBOR COUNTY DRAINAGE DITCH NO. 1 (GHCDD-1)	Azinphos-Methyl	15N	11W	06	0	0	AB55IV	None75
22	GRAYS HARBOR COUNTY DRAINAGE DITCH NO. 1 (GHCDD-1)	Carbaryl	15N	11W	06	0	0	AB55IV	None75
22	GRAYS HARBOR COUNTY DRAINAGE DITCH NO. 1 (GHCDD-1)	Diazinon	15N	11W	06	0	0	AB55IV	None75
22	GRAYS HARBOR COUNTY DRAINAGE DITCH NO. 1 (GHCDD-1)	Parathion	15N	11W	06	0	0	AB55IV	None75
22	HUMPTULIPS RIVER	Temperature	20N	10W	17			NY74PY	WA-22-1010
22	HUMPTULIPS RIVER	Temperature	20N	11W	12			TU95RU	WA-22-1010
22	RABBIT CREEK	Temperature	21N	06W	28			MV99EG	WA-22-4085
22	WILDCAT CREEK	Temperature	18N	05W	14			QS65DS	WA-22-4045

WRIA	Waterbody Name	Parameter	Township	Range	Section	Latitude	Longitude	New ID #	Old ID#
22	WYNOOCHEE RIVER	Temperature	18N	08W	05			PB22WC	WA-22-4020
23	BERWICK CREEK	Fecal Coliform	13N	02W	09			KB60UI	WA-23-1028
23	BLACK LAKE	Total Phosphorus	18N	02W	32			GW14BM	WA-23-9010
23	BLACK RIVER	Temperature	15N	04W	05			GW14BM	WA-23-1015
23	CHEHALIS RIVER	Fecal Coliform	13N	05W	03			DS29ZH	WA-23-1100
23	CHEHALIS RIVER	Fecal Coliform	13N	05W	34			DS29ZH	WA-23-1100
23	CHEHALIS RIVER	Fecal Coliform	14N	02W	07			DS29ZH	WA-23-1020
23	CHEHALIS RIVER	Fecal Coliform	14N	03W	24			DS29ZH	WA-23-1020
23	CHEHALIS RIVER	Fecal Coliform	17N	05W	28			DS29ZH	WA-23-1010
23	CHEHALIS RIVER	PCB-1254	14N	02W	07			DS29ZH	WA-23-1020
23	CHEHALIS RIVER	PCB-1260	14N	02W	07			DS29ZH	WA-23-1020
23	CHEHALIS RIVER	Temperature	13N	05W	12			DS29ZH	WA-23-1100
23	CHEHALIS RIVER	Temperature	14N	02W	07			DS29ZH	WA-23-1020
23	CHEHALIS RIVER	Temperature	14N	02W	18			DS29ZH	WA-23-1020
23	CHEHALIS RIVER	Temperature	14N	02W	24			HF89DS	WA-23-1020
23	CHEHALIS RIVER	Temperature	14N	03W	12			DS29ZH	WA-23-1020
23	CHEHALIS RIVER	Temperature	14N	03W	24			DS29ZH	WA-23-1020
23	CHEHALIS RIVER	Temperature	14N	03W	25			DS29ZH	WA-23-1020
23	CHEHALIS RIVER	Temperature	15N	03W	22			DS29ZH	WA-23-1010
23	CHEHALIS RIVER	Temperature	16N	05W	36			DS29ZH	WA-23-1010
23	CHEHALIS RIVER	Temperature	17N	05W	28			DS29ZH	WA-23-1010

WRIA	Waterbody Name	Parameter	Township	Range	Section	Latitude	Longitude	New ID #	Old ID#
23	CHEHALIS RIVER	Temperature	17N	05W	28			UE35GF	WA-23-1010
23	CHEHALIS RIVER, S.F.	Temperature	13N	04W	24			AR83EA	WA-23-1106
23	DEMSEY CREEK	Dissolved Oxygen	17N	03W	13			FM81JM	WA-23-2060
23	DEMSEY CREEK	Fecal Coliform	17N	03W	13			FM81JM	WA-23-2060
23	DILLENBAUGH CREEK	Fecal Coliform	13N	02W	05			EV39SR	WA-23-1027
23	DILLENBAUGH CREEK	Fecal Coliform	13N	02W	09			EV39SR	WA-23-1027
23	DILLENBAUGH CREEK	Fecal Coliform	13N	02W	10			EV39SR	WA-23-1027
23	DILLENBAUGH CREEK	Fecal Coliform	14N	02W	31			EV39SR	WA-23-1027
23	DILLENBAUGH CREEK	Temperature	13N	02W	05			EV39SR	WA-23-1027
23	DILLENBAUGH CREEK	Temperature	14N	02W	31			EV39SR	WA-23-1027
23	ELK CREEK	Fecal Coliform	13N	05W	03			WI74SE	WA-23-1108
23	LINCOLN CREEK	Fecal Coliform	15N	03W	34			AP15HC	WA-23-1019
23	LINCOLN CREEK	Fecal Coliform	15N	04W	33			AP15HC	WA-23-1019
23	LINCOLN CREEK	Temperature	15N	03W	29			EK51RF	WA-23-1019
23	NEWAUKUM RIVER	Fecal Coliform	14N	02W	31			WC81BX	WA-23-1070
23	NEWAUKUM RIVER	Temperature	14N	02W	31			WC81BX	WA-23-1070
23	SALZER CREEK	Fecal Coliform	14N	02W	19			QF44VO	WA-23-1023
23	SALZER CREEK	Fecal Coliform	14N	02W	23			QF44VO	WA-23-1023
23	SALZER CREEK	Temperature	14N	02W	19			QF44VO	WA-23-1023
23	SCATTER CREEK	Fecal Coliform	15N	03W	08			AQ85FY	WA-23-1018
23	SCATTER CREEK	pH	15N	03W	08			AQ85FY	WA-23-1018



**Appendix C**  
**Limiting Factors Standards**

## Humptulips Sub-Basin

**These are the restoration, preservation, and data gap actions recommended by the Limiting Factors TAG.  
The actions have been prioritized based upon the Limiting Factors Report coupled with professional judgement.**

Limiting Factor	LF Rating	Restoration Actions	Preservation Actions	Data Gap Actions
<b>Fish Passage</b>	DG. Known problems: Fair road density (2.8 mi/sq mi).	<p><b>H</b> - Open three or more miles of good quality habitat used by at least one stock of salmon or steelhead. <i>Exceptions:</i> include very cost efficient projects addressing unique limiting habitat or benefiting multiple stocks of salmon or steelhead.</p> <p><b>H</b> - Bridges are the preferred structure. If culverts are used, they should be sized to allow full access to all fish species and life history stages.</p>		<p><b>M</b> - Inventory, assess, and prioritize all habitat blockages (culverts, dikes, railroad grades, etc.) for all salmonid life history stages.</p> <p><b>M</b> - Develop a database housed with the lead entity, to contain all blockage data.</p>
<b>Floodplain Conditions</b>	Poor in WF & EF; Good in mainstem. Known problems: incision, limited off-channel habitat.	<p><b>H</b> - Reconnect potential off-channel habitat.</p> <p><b>H</b> - Restoration actions need to increase instream LWD to help address channel incision and flow issues. This includes appropriate riparian restoration to result in better future LWD levels.</p>	<b>H</b> - Maintain, conserve and prioritize off-channel and side channel habitat and associated riparian.	<b>M</b> - Inventory impacts and suitable restoration sites for floodplain habitat coincident with the barrier/culvert inventory.
<b>Sediment</b>	Poor (DG). Known problems: landslides caused by roads, bank erosion in lower reaches.	<p><b>H</b> - Improve road drainage at areas identified in watershed analysis.</p> <p><b>H</b> - Decommission road segments that are at high risk of causing landslides (watershed analysis).</p> <p><b>H</b> - Increase protection of steep and unstable slopes.</p> <p><b>H</b> - Stabilize and revegetate exposed mass wasting sites to reduce surface erosion.</p> <p><b>H</b> - Relocate gravel extraction activities away from shorelines and the 100-year floodplain.</p>		<p><b>H</b> - Inventory roads and assess impacts to salmonids and prioritize restoration actions accordingly.</p> <p><b>M</b> - Identify sites, extent, and restoration actions for bank erosion downstream of the forks.</p>

Limiting Factor	LF Rating	Restoration Actions	Preservation Actions	Data Gap Actions
		<b>H</b> - Reduce livestock access to streams, especially to the mainstem Humptulips River and Deep Creek.		
<b>Current Instream LWD</b>	Good in mainstem; Poor in tributaries.	<b>H</b> - Actions are needed to increase LWD, or similarly functioning natural structures, in appropriate places in the tributaries. This would include anchoring LWD and increasing natural recruitment potential (riparian restoration).	<b>H</b> - Prevent removal of appropriate pieces of LWD, and other natural structures, within the floodplain through increased education and enforcement.	<b>H</b> - Determine appropriateness through inventory or other assessment of LWD, or other natural structure(s), placement. (e.g. gravel recruiting, hydrology, wood or structure size, gradient, near term LWD recruitment potential, and valley confinement)
<b>Riparian</b>	Poor except in upper EF and upper WF. Known problems: riparian loss and conversion to hardwoods.	<b>H</b> - Revegetate open riparian areas with native plants including conifers in appropriate places. <b>M</b> - Interplant conifer into hardwood riparian areas that were historically conifer areas. <b>M</b> - Plant conifer adjacent to and outside existing and limited existing conifer and hardwood riparian areas.	<b>H</b> - Funds, lands, and easement opportunities should be identified to obtain areas of mid-to late seral stage riparian with priority given to older stands. This is applicable to lands that do not have current protection such as those outside of current forest practice regulations. <b>H</b> - Continue enforcement and revision of current regulations that preserve and enhance riparian regeneration.	<b>H</b> - Assess and prioritize recovery and protection for riparian conditions in the reaches downstream of the EF and WF confluence.
<b>Water Quality</b>	Poor. Known problems: warm water temperatures (likely due to poor riparian conditions).	<b>H</b> - Actions need to address sediment and riparian problems. <b>H</b> - Reduce livestock access to streams, especially to the mainstem Humptulips River and Deep Creek. <b>H</b> - Increase activities that lead to natural recharge of the aquifers and maintain or improve hydrological maturity. <b>H</b> - Restore wetlands and off-channel habitat.	<b>H</b> - Decrease activities that interfere with the natural recharge of aquifers or degrade hydrological maturity.	<b>H</b> - Monitor water temperature, dissolved oxygen, pH, and turbidity.
<b>Water Quantity</b>	Good in most areas. Concern about peak flows.	<b>M</b> - Increase activities that lead to natural recharge of the aquifers and maintain or improve hydrologic maturity.	<b>H</b> - Decrease activities that interfere with the natural recharge of aquifers or degrade hydrological maturity.	<b>M</b> - Reinstall the flow monitoring gage in the Humptulips River and monitor stream flows.

Limiting Factor	LF Rating	Restoration Actions	Preservation Actions	Data Gap Actions
		H -Restore wetlands and off-channel habitat.		
Biological Processes	Poor	L - Increase contribution of marine – derived nutrients through increased use of carcasses.		<p>H - Increase field surveys regarding salmonid distribution, escapement, and habitat use by life history stage.</p> <p>L - Assess marine-derived nutrient processes.</p>

## Wynoochee River Sub-Basin

These are the restoration, preservation, and data gap actions recommended by the Limiting Factors TAG.  
The actions have been prioritized based upon the Limiting Factors Report coupled with professional judgement.

Limiting Factor	LF Rating	Restoration Actions	Preservation Actions	Data Gap Actions
<b>Fish Passage</b>	DG. High road density in lower reaches, medium density in upper reaches.	<p><b>H</b> - Open three or more miles of good quality habitat used by at least one stock of salmon or steelhead. <i>Exceptions:</i> include very cost efficient projects addressing unique limiting habitat or benefiting multiple stocks.</p> <p><b>H</b> - Bridges are the preferred structure. If culverts are used, they should be sized to allow full access to all fish species and life history stages.</p>		<p><b>H</b> - Inventory, assess, and prioritize all habitat blockages (culverts, dikes, railroad grades, etc.) for all salmonid life history stages.</p> <p><b>H</b> - Develop a database housed with the lead entity, to contain all blockage data.</p>
<b>Floodplain Conditions</b>	DG - Poor in lower.	<p><b>H</b> - Reconnect potential off-channel habitat.</p> <p><b>H</b> - Reconnect off-channel habitat identified in Ralph et al. (1994).</p> <p><b>H</b> - Restoration actions need to increase instream LWD to help address channel incision and flow issues. This includes appropriate riparian restoration to result in better future LWD levels.</p>	<b>H</b> - Maintain, conserve, and prioritize off-channel and side channel habitat and associated riparian.	<b>H</b> - Inventory impacts and suitable restoration sites for floodplain habitat coincident with the barrier/culvert inventory.
<b>Sediment: Spawning gravel quantity</b>	Poor, except in upper reaches. High road density, high bank erosion, landslides.	<p><b>H</b> - Decommission roads at risk of landslides, especially side-cast roads.</p> <p><b>H</b> - Correct high impact road sediment delivery problems via push-outs, cross-drains, and sediment traps etc.</p> <p><b>H</b> - Increase protection of steep and unstable slopes.</p> <p><b>H</b> - Stabilize and revegetate exposed mass wasting sites to reduce surface erosion.</p> <p><b>H</b> - Relocate gravel extraction activities away from shorelines and the 100-year floodplain.</p>	<b>H</b> - Preserve beaver dams in lower 28 miles.	<p><b>H</b> - Inventory roads and assess impacts to salmonids and prioritize restoration actions accordingly.</p> <p><b>H</b> - Further study on WIN data.</p>

Limiting Factor	LF Rating	Restoration Actions	Preservation Actions	Data Gap Actions
<b>Water Quantity</b>	Poor, Poor hydrologic maturity, dam operation, water withdrawals.	<p><b>H</b> - Reduce water withdrawals from surface sources.</p> <p><b>H</b> - Increase activities that lead to natural recharge of the aquifers and maintain or improve hydrologic maturity.</p> <p><b>H</b> - Dam operations should emulate natural flow conditions during adult migration and juvenile emigration periods.</p> <p><b>H</b> - Restore wetlands and off-channel habitat.</p> <p><b>H</b> - Restore water quantity and buy back water rights.</p>	<p><b>H</b> - Decrease activities that interfere with the natural recharge of aquifers or degrade hydrological maturity.</p> <p><b>H</b> - Place a moratorium on further water withdrawal.</p>	<p><b>H</b> - Continue stream flow monitoring</p>
<b>Biological Processes</b>	Good	<p><b>L</b> - Increase contribution of marine - derived nutrients through increased use of carcasses.</p>		<p><b>H</b> - Increase field surveys for salmonid escapement, distribution, and habitat use by life history stage.</p> <p><b>L</b> - Assess marine-derived nutrient processes.</p>

## Satsop Sub-Basin

These are the restoration, preservation, and data gap actions recommended by the Limiting Factors TAG.  
The actions have been prioritized based upon the Limiting Factors Report coupled with professional judgement.

Limiting Factor	LF Rating	Restoration Actions	Preservation Actions	Data Gap Actions
<b>Fish Passage</b>	DG (Suspect Poor). Known problems: high road density (4 mi/sq mi), limited refuge habitat.	<p><b>H</b> - Open three or more miles of good quality habitat used by at least one stock of salmon or steelhead. <i>Exceptions:</i> include very cost efficient projects addressing unique limiting habitat or benefiting multiple stocks.</p> <p><b>H</b> - Prioritize the restoration of culverts blocking passage in the WF and MF Satsop due to limited winter refuge.</p> <p><b>H</b> - Bridges are the preferred structure. If culverts are used, they should be sized to allow full access to all fish species and life history stages.</p>		<p><b>H</b> - Inventory, assess, and prioritize all habitat blockages (culverts, dikes, railroad grades, etc.) for all salmonid life history stages.</p> <p><b>H</b> - Develop a database housed with the lead entity, to contain all blockage data.</p>
<b>Floodplain Conditions</b>	DG. Known problems: limited refuge habitat.	<p><b>H</b> - Reconnect potential off-channel habitat. Follow recommendations in Ralph et al. 1994.</p> <p><b>H</b> - Restoration actions need to increase instream LWD to help address channel incision and flow issues. This includes appropriate riparian restoration to result in better future LWD levels.</p>	<b>H</b> - Maintain, conserve, and prioritize off-channel and side channel habitat and associated riparian.	<b>H</b> - Inventory impacts and suitable restoration sites for floodplain habitat coincident with the barrier/culvert inventory.
<b>Sediment</b>	Poor (DG). Known problems: very high sediment loads (sidecast roads) and sediment transport, high road densities, and low LWD.	<p><b>H</b> - Decommission roads at risk of landslides, especially side-cast roads.</p> <p><b>H</b> - Correct high impact road sediment delivery problems via push-outs, cross-drains, and sediment traps etc.</p> <p><b>H</b> - Increase protection of steep and unstable slopes.</p> <p><b>H</b> - Stabilize and revegetate exposed mass wasting sites to reduce surface erosion.</p>		<p><b>H</b> - Inventory roads and assess impacts to salmon and steelhead as well as prioritize restoration actions.</p> <p><b>H</b> - Inventory and prioritize sediment sources in the MF and EF Satsop watersheds.</p>

Limiting Factor	LF Rating	Restoration Actions	Preservation Actions	Data Gap Actions
		<p><b>H</b> – Relocate gravel extraction activities away from shorelines and the 100-year floodplain.</p> <p><b>H</b> - Reduce livestock access to streams, especially in Drybed, Decker, Bingham Creeks and the West Fork and East Fork Satsop Rivers.</p> <p><b>L</b> - Provide education regarding the impacts of vehicle activity in streams and increase enforcement.</p>		
<b>LWD</b>	Poor in WF, DG elsewhere. Known problems: low LWD.	<p><b>H</b> - Actions are needed to increase LWD, or similarly functioning natural structures, in appropriate places. This would include anchoring or recruiting in the system. Priority should be given to the WF and MF watersheds.</p>	<p><b>H</b> – Prevent removal of appropriate pieces of LWD, and other natural structures, within the floodplain through increased education and enforcement.</p>	<p><b>H</b> - Determine appropriateness through inventory or other assessment of LWD, or other natural structure(s), placement. (e.g. gravel recruiting, hydrology, wood or structure size, gradient, near term LWD recruitment potential, and valley confinement)</p>
<b>Riparian</b>	Poor (DG, based upon coarse data). Known problems: riparian loss, conversion to hardwoods.	<p><b>H</b> - Revegetate open riparian areas with native plants including conifers in appropriate places.</p> <p><b>M</b> - Interplant conifer into hardwood riparian areas that were historically conifer areas.</p> <p><b>M</b>- Plant conifer adjacent to and outside existing and limited existing conifer and hardwood riparian areas.</p>	<p><b>H</b> - Funds, lands, and easement opportunities should be identified to obtain areas of mid-to late seral stage riparian with priority given to older stands. This is applicable to lands that do not have current protection such as those outside of current forest practice regulations.</p> <p><b>H</b> – Continue enforcement and revision of current regulations that preserve and enhance riparian regeneration.</p>	<p><b>H</b> - Assess and prioritize recovery and protection for riparian conditions in all areas of the Satsop except in the WF.</p>
<b>Water Quality</b>	Poor, with some data gaps. Known problems: warm water temperatures likely due to poor riparian conditions, and high turbidity, related to sedimentation.	<p><b>H</b> - Actions need to address sediment, riparian, and flow problems.</p> <p><b>H</b> - Increase activities that lead to natural recharge of the aquifers and maintain or improve hydrological maturity.</p>	<p><b>H</b> - Decrease activities that interfere with the natural recharge of aquifers or degrade hydrological maturity.</p>	<p><b>M</b> - Monitor water temperature, dissolved oxygen, pH, and turbidity in each fork of the Satsop River.</p>



Limiting Factor	LF Rating	Restoration Actions	Preservation Actions	Data Gap Actions
		<p><b>H</b> - Reduce livestock access to streams, especially in Drybed, Decker, Bingham Creeks and the West Fork and East Fork Satsop Rivers.</p> <p><b>H</b> - Restore wetlands and off-channel habitat.</p>		
<b>Water Quantity</b>	Poor in mainstem and MF; DG in WF; Good in EF. Known problems: increased peak flows, reduced hydrologic maturity, high risk of scour.	<p><b>H</b> - Actions need to address sediment, riparian, and flow problems.</p> <p><b>H</b> - Reduce water withdrawals from surface sources.</p> <p><b>H</b> - Increase activities that lead to natural recharge of the aquifers and maintain or improve hydrologic maturity.</p> <p><b>H</b> - Restore wetlands and off-channel habitat.</p>	<b>H</b> - Decrease activities that interfere with the natural recharge of aquifers or degrade hydrological maturity.	<p><b>H</b> - Investigate and prioritize causes of low summer flow in the lower Satsop River.</p> <p><b>M</b> - Monitor scour in the WF, MF, and mainstem Satsop.</p>
<b>Biological Processes</b>	Fair	<b>L</b> - Increase contribution of marine – derived nutrients through increased use of carcasses.		<p><b>H</b> - Increase field surveys for salmonid escapement, distribution, and habitat use by life history stage.</p> <p><b>L</b> - Assess marine-derived nutrient processes.</p>

**Appendix D**  
**Permanent Flood Protection Measures**

SOURCE: FEMA

PERMANENT FLOOD PROTECTION MEASURES

A. RELOCATION

Advantages of Relocation

- \* No more worrying about flooding.
- \* No dependence on human intervention.
- \* Relocation techniques are highly refined and contractors are readily available.
- \* Flood insurance premiums will be eliminated.
- \* Some sources of outside funding may be available

Disadvantages of Relocation

- \* Expensive.
- \* You still own a flood prone lot.

B. ELEVATION

Advantages of Relocation

- \* Reduce or eliminate damage to structure and contents.
- \* No need to relocate vulnerable items.
- \* Flood insurance premiums will be reduced.
- \* The techniques are well known and contractors are readily available.

Disadvantages of Elevation

- \* The appearance of the structure may be adversely affected.
- \* Evacuation during a flood is still necessary.
- \* Supporting foundation may be weakened or fail, especially in areas with high velocity, resulting in major damages.
- \* Isolated buildings are more susceptible to other problems. An elevated house surrounded by floodwater is difficult to protect from fire, theft, or vandalism.

## C. LEVEES and FLOODWALLS

### Advantages of Levees and Floodwalls

- \* The area around your house will be protected from inundation, making it safer and easier to get in and out.
- \* There is no water pressure on the house or other buildings in the protected areas.
- \* Usually less expensive than elevating or relocating.

### Disadvantages of Levees and Floodwalls

- \* Levees and floodwalls can fail or be overtopped by large floods. Your house would have no protection if this occurs. For this reason, these measures can create a false sense of security.
- \* Both levees and floodwalls need periodic maintenance.
- \* Internal drainage must be handled.
- \* Local drainage can be affected, possibly resulting in water problems for others.
- \* Flood insurance rates will not be lowered.
- \* Levees require considerable land.
- \* Levees and floodwalls do not eliminate the need to evacuate during floods. If you remain in your house, you may be trapped and exposed to very serious hazards in the event of barrier failure or overtopping.

## D. DRY FLOODPROOFING

### Advantages of Dry Floodproofing

- \* All contents of the house are kept dry if the limits are not exceeded.
- \* Dry floodproofing could be simpler and less costly than levees or floodwalls if the flood depth is less than 2 feet.

### Disadvantages of Dry Floodproofing

- \* There will be no reduction in flood insurance premiums.
- \* The closing of some openings may require adequate warning.
- \* Dry floodproofing measures can fail or be exceeded by large floods. If this occurs, the effect will be as if there was no protection at all.
- \* If design loads (lateral, uplift, or dynamic) are exceeded. Walls may collapse, floors may buckle, the structure may even float. This could result in more damage than just letting the house flood.
- \* Closures are not always aesthetically pleasing.
- \* The damage to the exterior of the structure, landscaping, and other property is not reduced.

- \* Levees and floodwalls do not eliminate the need to evacuate during floods. If you remain in your house, you may be trapped and exposed to very serious hazards in the event of failure or overtopping.

#### E. WET FLOODPROOFING

##### Advantages of Wet Floodproofing

- \* No matter how small the effort, some wet floodproofing will reduce flood damage to your house and its contents.
- \* Loads placed on the walls and floor of your house will be greatly reduced.
- \* Costs for relocating or storing property (except basement property) after a flood warning is issued are covered by flood insurance.

##### Disadvantages of Wet Floodproofing

- \* Flood warning is usually needed.
- \* The evacuation of property from the flood prone area is dependent on human intervention.
- \* There will be no reduction in flood insurance rates.
- \* Your house will get wet inside and cleanup will still be necessary.
- \* You may have to adjust your use of the floodable area.

**Comparative Table on Permanent Flood Protection Measures**

<b>Key Consideration</b>	<b>Relocation</b>	<b>Elevation</b>	<b>Levee/Wall</b>	<b>Dry Floodproof</b>	<b>Wet Floodproof</b>
<b>Condition of Building</b>	small, wood frame, on crawlspace or basement	small, wood frame, on crawlspace	large lot	masonry walls, on slabs	unfinished basement or garage
<b>Flood Hazard</b>	all types	depth up to 9 feet, lower velocities	depth up to 6 feet, shorter duration	depth up to 3 feet, lower velocities	depth up to bottom of first floor joists, lower velocities
<b>Floodplain Regulations</b>	no restrictions	may be required to elevate to 100 year flood level	may be prohibited in floodway	major projects (substantial improvements) may be prohibited	no restrictions
<b>Human Intervention</b>	no	no	usually: to close openings and start pumps	yes: close openings and valves	yes: to move contents and turn off utilities
<b>Technical Expertise</b>	house mover	house mover	soils expert (engineer if high velocity)	structural engineer	not required
<b>Cost Range</b>	\$22,000 to \$87,000	\$10,000 to \$42,000	minimal to \$15,000	minimal to \$10,000	minimal to \$5,000
<b>Other Benefits</b>	eliminates worry	insurance premiums reduced	surrounding area not inundates	contents stay dry	structural loads reduced
<b>Other Considerations</b>	new site	dynamic pressures on foundation	erosion, overtopping	overtopping, static pressures on walls and floor	warning needed, basement purposefully flooded

**NOTE:** This table only highlights certain factors to consider. For example, any type of building can be elevated, it is just easier and cheaper to elevate small, frame buildings on crawlspaces. Additional technical expertise such as electricians, plumbers, and engineers is recommended for all the categories.

**Appendix E**  
**CRS Credit Program**

## 120 CRS CREDIT POINTS

### 121 Application for Credit

The Community Rating System provides for 10 classes, with Class 1 having the most premium credit and communities in Class 10 receiving none. A community's CRS class is based on the number of credit points calculated for the activities that are undertaken to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance.

A community is automatically a Class 10 community unless it applies for a CRS classification and shows that the activities it is implementing warrant a better classification. A community may apply for CRS credit by submitting a *CRS Application* with appropriate documentation to its ISO/CRS Specialist. Application prerequisites and documentation are discussed in more detail in Section 210.

A community uses the *CRS Application* for its initial application for CRS classification. The community must have at least 500 points using the *CRS Application* to apply for CRS Classification. As explained in Section 230, the final score will be calculated by the ISO/CRS Specialist after a review of the documentation and the community's implementation of its activities at the verification visit.

It is important that the community submit correct and complete materials needed to show what it is doing. Only through a review of the accompanying documentation can FEMA and ISO determine the credit points that should be provided.

A community should apply only for those activities it is actively undertaking and those it knows it can implement in accordance with the *Schedule*. A community should not be overly ambitious and overestimate its first year credit points at the risk of losing credit later for activities it is unable to implement. For example, no credit is provided for draft ordinances. Communities can only receive credit for regulations that have been enacted and enforced.

### 122 Activity Credit Points

The activities and their maximum credit points are shown in Table 120-1. The third column shows the average credit points received by previous years' applicants for each activity. The averages are based upon the number of applicants for each activity, NOT the total number of applicants for the CRS. The fourth column shows the percentage of all applicants that received credit for each activity. Therefore, the average of 81 points for Activity 330 is the estimated average under this 1999 manual for the 62% of the 895 communities that were receiving verified credit for Activity 330 at the end of 1997.

Communities should note the average credits for these activities. They provide a better indication of what an applicant can expect for an activity than do the maximum points available. For example, in order to receive 3,200 points for Activity 520 (Acquisition and Relocation), a community must have removed 100% of the structures from the Special Flood Hazard Areas



(SFHAs) shown on its FIRM. The 9% of all communities that applied for credit under Activity 520 averaged 177 points received for their acquisition and relocation work. At least one community has received 1,700 points for Activity 520.

**Table 120-1. Credit points awarded for CRS activities.**

ACTIVITY	MAXIMUM POSSIBLE POINTS <sup>1</sup>	AVERAGE POINTS EARNED <sup>2</sup>	MAXIMUM POINTS EARNED <sup>3</sup>	PERCENTAGE OF COMMUNITIES CREDITED <sup>4</sup>
<b>300 Public Information Activities</b>				
310 Elevation Certificates	142	72	142	100%
320 Map Information	140	138	140	96%
330 Outreach Projects	290	81	260	62%
340 Hazard Disclosure	81	24	81	47%
350 Flood Protection Library	30	22	30	84%
360 Flood Protection Assistance	71	57	71	39%
<b>400 Mapping &amp; Regulatory Activities</b>				
410 Additional Flood Data	1,230	148	538	20%
420 Open Space Preservation	900	206	743	75%
430 Higher Regulatory Standards	1,750	159	658	71%
440 Flood Data Maintenance	226	78	170	59%
450 Stormwater Management	670	132	430	75%
<b>500 Flood Damage Reduction Activities</b>				
510 Floodplain Management Plan	235	34	178	10%
520 Acquisition and Relocation	3,200	177	1,700	9%
530 Retrofitting	2,800	66	352	4%
540 Drainage System Maintenance	330	236	305	78%
<b>600 Flood Preparedness Activities</b>				
610 Flood Warning Program	200	99	200	27%
620 Levee Safety	900	153	520	1%
630 Dam Safety	120	66	98	82%

<sup>1</sup> The maximum possible points do not include credit for management of special hazards.

<sup>2</sup> The average points earned are based on conversions of the average scores for 1991–1997 to the 1999 CRS Coordinator's Manual. Not all elements can be converted directly to the 1999 system, so some figures are approximate. The average points earned include credit for growth rates, discussed in Section 710.

<sup>3</sup> The maximum points earned are the highest scores attained by a community. In some cases many communities have attained the maximum points listed.

<sup>4</sup> The percentage of communities credited is based on the number of CRS communities receiving the credits in 1997.

## **123 A Quick Check of a Community's Potential CRS Credit**

### **a. Purpose**

A minimum of 500 points is needed to receive a CRS classification of Class 9, which will reduce premium rates. This quick check provides some basic information for local officials to determine if their communities will have enough points to attain Class 9.

If a community does not qualify for at least 500 points, it may want to initiate some new activities in order to attain Class 9. For example, some of the public information activities can be implemented for a very low start-up cost. The quick check can identify where points can be earned for new activities.

### **b. Quick Check Instructions**

The section numbering system is used throughout all CRS publications. Sections 300 through 600 describe the 18 creditable activities. Activity 310 (Elevation Certificates) is required of all CRS communities and Activity 510 (Floodplain Management Planning) is required of designated repetitive loss communities. The rest of the activities are optional. Only the elements most frequently applied for are listed.

If the activity is applicable, the average community score (which is in parentheses) should be entered in the blank to the left to provide a rough estimate of the community's initial credit points.

### **c. Minimum Requirements**

**Section 211 (Prerequisites)** The community must be in the Regular Phase of the NFIP and be in full compliance with the minimum requirements of the NFIP. The application must include a letter from the Federal Emergency Management Agency (FEMA) Regional Office confirming that the community is meeting all of the latest NFIP requirements.

**Activity 310 (Elevation Certificates)** All CRS communities must maintain FEMA's elevation certificates for all new and substantially improved construction in the floodplain after the date of application for CRS classification.

**Sections 501-503 (Repetitive Loss Areas)** A community with properties that have received repeated flood insurance claim payments must map the areas affected. Communities with 10 or more such properties must prepare, adopt, and implement a plan to reduce damage in repetitive loss areas. The FEMA Regional Office can tell whether this applies to any given community.

#### **d. Other Activities**

If the activity is applicable, the average community score (which is in parentheses) should be entered in the blank at left to provide a rough estimate of the community's initial credit points.

##### **Public Information Activities (Series 300)**

- \_\_\_\_\_ (72) 310 (Elevation Certificates) Maintain FEMA elevation certificates for all new construction. Maintaining them after the date of CRS application is a minimum requirement for any CRS credit.
- \_\_\_\_\_ (138) 320 (Map Information) Respond to inquiries to identify a property's FIRM zone and publicize this service.
- \_\_\_\_\_ (81) 330 (Outreach Projects) Send information about the flood hazard, flood insurance, and flood protection measures to floodprone residents or all residents of the community.
- \_\_\_\_\_ (24) 340 (Hazard Disclosure) Real estate agents advise potential purchasers of floodprone property about the flood hazard; or regulations require a notice of the flood hazard.
- \_\_\_\_\_ (22) 350 (Flood Protection Library) The public library maintains references on flood insurance and flood protection.
- \_\_\_\_\_ (57) 360 (Flood Protection Assistance) Give inquiring property owners technical advice on protecting their buildings from flooding, and publicize this service.

##### **Mapping and Regulatory Activities (Series 400)**

- \_\_\_\_\_ (148) 410 (Additional Flood Data) Develop new flood elevations, floodway delineations, wave heights, or other regulatory flood hazard data for an area that was not mapped in detail by the flood insurance study; or have the flood insurance study's hydrology or allowable floodway surcharge based on a higher state or local standard.
- \_\_\_\_\_ (206) 420 (Open Space Preservation) Guarantee that a portion of currently vacant floodplain will be kept free from development.
- \_\_\_\_\_ (159) 430 (Higher Regulatory Standards) Require freeboard; require soil tests or engineered foundations; require compensatory storage; zone the floodplain for minimum lot sizes of 1 acre or larger; regulate to protect sand dunes; or have regulations tailored to protect critical facilities or areas subject to special flood hazards (e.g., alluvial fans, ice jams, or subsidence).

\_\_\_\_\_ **TOTAL FIRST PAGE**

- \_\_\_\_\_ (78) 440 (Flood Data Maintenance) Keep flood and property data on computer records; use better base maps; or maintain elevation reference marks.
- \_\_\_\_\_ (132) 450 (Stormwater Management) Regulate new development throughout the watershed to ensure that post-development runoff is no worse than pre-development runoff.

**Flood Damage Reduction Activities (Series 500)**

- \_\_\_\_\_ (34) 510 (Floodplain Management Planning) Prepare, adopt, implement, and update a comprehensive plan using a standard planning process.
- \_\_\_\_\_ (177) 520 (Acquisition and Relocation) Acquire and/or relocate floodprone buildings so that they are out of the floodplain.
- \_\_\_\_\_ (66) 530 (Retrofitting) Document floodproofed or elevated pre-FIRM buildings.
- \_\_\_\_\_ (236) 540 (Drainage System Maintenance) Conduct periodic inspections of all channels and retention basins and perform maintenance as needed.

**Flood Preparedness Activities (Series 600)**

- \_\_\_\_\_ (99) 610 (Flood Warning Program) Provide early flood warnings to the public and have a detailed flood response plan keyed to flood crest predictions.
- \_\_\_\_\_ (153) 620 (Levee Safety) Maintain levees that are not credited with providing base flood protection.
- \_\_\_\_\_ (66) 630 (Dam Safety) All communities in a state with an approved dam safety program receive credit.

\_\_\_\_\_ TOTAL SECOND PAGE

\_\_\_\_\_ TOTAL FIRST PAGE

\_\_\_\_\_ TOTAL ESTIMATED POINTS FOR THE COMMUNITY

If this quick check shows that the community could receive at least 500 points, it may want to check its status in the NFIP with the FEMA Regional Office (see Appendix A) and apply for a CRS classification using the *CRS Application*.

## 124 Publications

The *CRS Application* is used to apply for an initial CRS classification. The basis for CRS credit and community classification is the *Schedule*, which is contained within the *Coordinator's Manual*. The *Commentary* explains and amplifies the *Schedule* and provides examples. The *Coordinator's Manual* is a document a community should have if it wishes to submit a *CRS Application* and **MUST USE** for modifications for a better CRS classification.

There are a variety of publications available, including activity worksheets, example plans, and publications on credit for mapping and management of special flood-related hazards. These publications are described in Appendix E of the *CRS Application* and the *Coordinator's Manual*. They are available **AT NO COST** from

Flood Publications  
NFIP/CRS  
P.O. Box 501016  
Indianapolis, IN 46250-1016  
(317) 848-2898  
Fax: (317) 848-3578

**Appendix F**  
**Cost Estimates**

Grays Harbor Flooding  
05-Jan-2001

Estimator: C. Moore  
Project Number: 157355.RR.A4.01

Order of Magnitude								Notes
Item	Description	Quantity	Units	Material Unit Cost	Labor & Equip	Total Unit Cost	Total	
15b	Wynoochee Tracts							
	Dike	2000	LF					
	Clear and Grub	1.7	ACRE	\$ -	\$ -	\$ 4,000.00	\$ 6,979	haul debris offsite
	Build Dike	8,519	CY	\$ 12.00	\$ 6.54	\$ 18.54	\$ 157,950	Assume 3 to 1 slope, @ 400 cy/day, allow for material cost
	Hydroseed	8,444	SY	\$ -	\$ -	\$ 0.30	\$ 2,533	Subcontracted
	Subtotal						\$ 167,462	
	CONTINGENCY	30%					\$ 50,239	
	SUBTOTAL						\$ 217,701	
	MOBILIZATION	10%					\$ 21,770	
	SUBTOTAL						\$ 239,471	
	SALES TAX	7.9%					\$ 18,918	
	TOTAL CONSTRUCTION COSTS						\$ 258,389	
	ENG., LEGAL & ADMIN	35.0%					\$ 90,436	
	TOTAL PROJECT COSTS (ROUNDED)						\$ 348,800	

NOTE: The above cost opinion is in January 2001 dollars and does not include escalation, construction management, financing, O&M or hazardous material mitigation costs.

The order of magnitude cost opinion shown has been prepared for guidance in project evaluation from the information available at the time of preparation.

The final costs of the project will depend on actual labor and material costs, actual site conditions, actual site productivity, competitive market conditions, final project scope, final project schedule and other variable factors. As a result, the final project costs will vary from those presented above. Because of these factors, funding needs must be carefully reviewed prior to making specific financial decisions or establishing final budgets.

Grays Harbor Flooding  
05-Jan-2001

Estimator: C. Moore  
Project Number: 157355.RR.A4.01

Order of Magnitude								
Item	Description	Quantity	Units	Material Unit Cost	Labor & Equip	Total Unit Cost	Total	Notes
13a	Geissler Road							
	Dike	0	LF					
	Clear and Grub	-	ACRE	\$ -	\$ -	\$ 4,000.00	\$ -	haul debris offsite
	Silt Fence & erosion control	-	LF	\$ -	\$ -	\$ 5.00	\$ -	Erosion control along stream
	Build Dike	-	CY	\$ 12.00	\$ 6.54	\$ 18.54	\$ -	Assume 3 to 1 slope, @ 400 cy/day, allow for material cost
	Hydroseed	-	SY	\$ -	\$ -	\$ 0.30	\$ -	Subcontracted
	Install Overflow Culvert							
	Excavate for Culverts	67	CY	\$ -	\$ 9.29	\$ 9.29	\$ 620	Assume 4' width @ 200 cy/day
	Culvert	7	EA	\$ 1,600.00	\$ 880.38	\$ 2,480.38	\$ 17,363	3'x6 box culvert, C-850, 8' lengths, ph quote PIPE 1/4/00
	Bedding	11	CY	\$ 15.00	\$ 15.55	\$ 30.55	\$ 339	
	Waste	48	CY	\$ -	\$ -	\$ 3.00	\$ 145	haul waste offsite
	Native Backfill	18	CY	\$ -	\$ 5.87	\$ 5.87	\$ 107	Assume @ 150 cy/day
	Emergency Access	1	LS	\$ -	\$ -	\$ 2,000.00	\$ 2,000	Assume only access road & provide access during construction
	Subtotal						\$ 20,574	
	CONTINGENCY	30%					\$ 6,172	
	SUBTOTAL						\$ 26,746	
	MOBILIZATION	10%					\$ 2,675	
	SUBTOTAL						\$ 29,421	
	SALES TAX	7.9%					\$ 2,324	
	TOTAL CONSTRUCTION COSTS						\$ 31,745	
	ENG., LEGAL & ADMIN	35.0%					\$ 11,111	
	TOTAL PROJECT COSTS (ROUNDED)						\$ 42,900	

NOTE: The above cost opinion is in January 2001 dollars and does not include escalation, construction management, financing, O&M or hazardous material mitigation costs.

The order of magnitude cost opinion shown has been prepared for guidance in project evaluation from the information available at the time of preparation.

The final costs of the project will depend on actual labor and material costs, actual site conditions, actual site productivity, competitive market conditions, final project scope, final project schedule and other variable factors. As a result, the final project costs will vary from those presented above. Because of these factors, funding needs must be carefully reviewed prior to making specific financial decisions or establishing final budgets.



Grays Harbor Flooding  
19-Mar-2001

Estimator: C. Moore  
Project Number: 157355.RR.A4.01

Order of Magnitude		Quantity	Units	Material	Labor &	Total			Notes
Item	Description			Unit Cost	Equip	Unit Cost	Total		
20	Satsop Riviera								
	Channel: Option 1	6000	LF	Length					
		80	LF	Bottom Width					
		170	LF	Top Width					
	Clear and Grub	23	ACRE	\$ -	\$ -	\$ 2,000.00	\$ 46,832		haul debris offsite
	Silt Fence & erosion control	680	LF	\$ -	\$ -	\$ 5.00	\$ 3,400		Erosion control along stream at ends
	Hydroseed	3,340	SY	\$ -	\$ -	\$ 0.30	\$ 1,002		Subcontracted
	Excavate for Channel	27,778	CY	\$ -	\$ 3.13	\$ 3.13	\$ 86,855		800 cy/day
	Waste	27,778	CY	\$ -	\$ -	\$ 3.00	\$ 83,333		haul waste offsite and stockpile within 5 Miles
	Temporary Road	1	LS	\$ -	\$ -	\$ 20,000.00	\$ 20,000		provide access during construction of Bridge, includes removal afterward
	Demo existing road	844	LS	\$ 5.00	\$ -	\$ 5.00	\$ 4,222		Pavement Removal
	2 Lane Bridge plus sidewalk	6840	SF	\$ 120.00	\$ -	\$ 120.00	\$ 820,800		6' shoulders & barriers, 12' lanes
	Subtotal					\$	1,066,445		
	CONTINGENCY	30%				\$	319,933		
	SUBTOTAL					\$	1,386,378		
	MOBILIZATION	10%				\$	138,638		
	SUBTOTAL					\$	1,525,016		
	SALES TAX	7.9%				\$	120,476		
	TOTAL CONSTRUCTION COSTS					\$	1,645,492		
	ENG., LEGAL & ADMIN	35.0%				\$	575,922		\$481,222
	TOTAL PROJECT COSTS (ROUNDED)					\$	2,221,400	\$	1,760,178
	Channel: Option 2	6000	LF	Length					
		170	LF	Bottom Width					
		260	LF	Top Width					
	Clear and Grub	36	ACRE	\$ -	\$ -	\$ 2,000.00	\$ 71,625		haul debris offsite
	Silt Fence & erosion control	1,040	LF	\$ -	\$ -	\$ 5.00	\$ 5,200		Erosion control along stream at ends
	Hydroseed	11,735	SY	\$ -	\$ -	\$ 0.30	\$ 3,521		Subcontracted
	Excavate for Channel	47,778	CY	\$ -	\$ 3.13	\$ 3.13	\$ 149,391		800 cy/day
	Waste	47,778	CY	\$ -	\$ -	\$ 3.00	\$ 143,333		haul waste offsite and stockpile within 5 Miles
	Temporary Road	1	LS	\$ -	\$ -	\$ 20,000.00	\$ 20,000		provide access during construction of Bridge, includes removal afterward
	Demo existing road	1244	LS	\$ 5.00	\$ -	\$ 5.00	\$ 6,222		Pavement Removal
	2 Lane Bridge plus sidewalk	10080	SF	\$ 120.00	\$ -	\$ 120.00	\$ 1,209,600		8' sidewalk, 8' shoulders, 12' lanes
	Subtotal					\$	1,608,892		
	CONTINGENCY	30%				\$	482,668		
	SUBTOTAL					\$	2,091,560		
	MOBILIZATION	10%				\$	209,156		
	SUBTOTAL					\$	2,300,716		
	SALES TAX	7.9%				\$	181,757		
	TOTAL CONSTRUCTION COSTS					\$	2,482,473		
	ENG., LEGAL & ADMIN	35.0%				\$	868,865		\$777,100
	TOTAL PROJECT COSTS (ROUNDED)					\$	3,351,300	\$	2,574,200

Grays Harbor Flooding  
19-Mar-2001

Estimator: C. Moore  
Project Number: 157355.RR.A4.01

Order of Magnitude	Quantity	Units	Material Unit Cost	Labor & Equip	Total Unit Cost	Total	Notes
Item Description							
Channel: Option 3	6000	LF	Length				
	205	LF	Bottom Width				
	295	LF	Top Width				
Clear and Grub	41	ACRE	\$ -	\$ -	\$ 2,000.00	\$ 81,267	haul debris offsite
Silt Fence & erosion control	1,180	LF	\$ -	\$ -	\$ 5.00	\$ 5,900	Erosion control along stream at ends
Hydroseed	16,365	SY	\$ -	\$ -	\$ 0.30	\$ 4,910	Subcontracted
Excavate for Channel	55,556	CY	\$ -	\$ 3.13	\$ 3.13	\$ 173,710	800 cy/day
Waste	55,556	CY	\$ -	\$ -	\$ 3.00	\$ 166,667	haul waste offsite and stockpile within 5 Miles
Temporary Road	1	LS	\$ -	\$ -	\$ 20,000.00	\$ 20,000	provide access during construction of Bridge, Includes removal afterward
Demo existing road	1400	LS	\$ 5.00	\$ -	\$ 5.00	\$ 7,000	Pavement Removal
2 Lane Bridge plus sidewalk	11340	SF	\$ 120.00	\$ -	\$ 120.00	\$ 1,360,800	8' sidewalk, 8' shoulders, 12' lanes
Subtotal					\$	1,820,254	
CONTINGENCY	30%				\$	546,076	
SUBTOTAL					\$	2,366,330	
MOBILIZATION	10%				\$	236,633	
SUBTOTAL					\$	2,602,963	
SALES TAX	7.9%				\$	205,634	
TOTAL CONSTRUCTION COSTS					\$	2,808,597	
ENG., LEGAL & ADMIN	35.0%				\$	983,009	\$900,804
TOTAL PROJECT COSTS (ROUNDED)					\$	3,791,600	\$ 2,890,796

NOTE: The above cost opinion is in January 2001 dollars and does not include escalation, construction management, financing, O&M or hazardous material mitigation costs. The order of magnitude cost opinion shown has been prepared for guidance in project evaluation from the information available at the time of preparation. The final costs of the project will depend on actual labor and material costs, actual site conditions, actual site productivity, competitive market conditions, final project scope, final project schedule and other variable factors. As a result, the final project costs will vary from those presented above. Because of these factors, funding needs must be carefully reviewed prior to making specific financial decisions or establishing final budgets.

Grays Harbor Flooding  
05-Jan-2001

Estimator: C. Moore  
Project Number: 157355.RR.A4.01

Order of Magnitude									
Item	Description	Quantity	Units	Material Unit Cost	Labor & Equip	Total Unit Cost	Total	Notes	
6	Humptulps Valley Road								
	Dike	4,400	LF						
	Survey Dike	4	ACRE	\$ -	\$ -	\$ 700.00	\$ 2,687		
	Clear and Grub	0.4	ACRE	\$ -	\$ -	\$ 4,000.00	\$ 1,535		Assume 10% low, haul debris offsite
	Raise Berm	391	CY	\$ 12.00	\$ 6.54	\$ 18.54	\$ 7,252		Assume 10% length raised 3ft, 3 to 1 slope, @200 cy/day, allow for material cost
	Silt Fence & erosion control	440	LF	\$ -	\$ -	\$ 5.00	\$ 2,200		Erosion control along stream
	Excavate for Culverts	178	CY	\$ -	\$ 9.29	\$ 9.29	\$ 1,652		Assume 4' width 6' avg depth @200 cy/day
	Culvert	3	EA	\$ 1,525.00	\$ 880.38	\$ 2,405.38	\$ 7,216		Assume 24" RCP 50' each w/ flap gate
	Bedding	22	CY	\$ 15.00	\$ 15.55	\$ 30.55	\$ 679		Assume @150 cy/day
	Waste	49	CY	\$ -	\$ -	\$ 3.00	\$ 148		haul waste offsite
	Native Backfill	129	CY	\$ -	\$ 5.87	\$ 5.87	\$ 755		
	Hydroseed	1,858	SY	\$ -	\$ -	\$ 0.30	\$ 557		Subcontracted
	Subtotal						\$ 24,681		
	CONTINGENCY	30%					\$ 7,404		
	SUBTOTAL						\$ 32,085		
	MOBILIZATION	10%					\$ 3,209		
	SUBTOTAL						\$ 35,294		
	SALES TAX	7.9%					\$ 2,788		
	TOTAL CONSTRUCTION COSTS						\$ 38,082		
	ENG., LEGAL & ADMIN	35.0%					\$ 13,329		
	TOTAL PROJECT COSTS (ROUNDED)						\$ 51,000		

NOTE: The above cost opinion is in January 2001 dollars and does not include escalation, construction management, financing, O&M or hazardous material mitigation costs. The order of magnitude cost opinion shown has been prepared for guidance in project evaluation from the information available at the time of preparation. The final costs of the project will depend on actual labor and material costs, actual site conditions, actual site productivity, competitive market conditions, final project scope, final project schedule and other variable factors. As a result, the final project costs will vary from those presented above. Because of these factors, funding needs must be carefully reviewed prior to making specific financial decisions or establishing final budgets.

Grays Harbor Flooding  
05-Jan-2001

Estimator: C. Moore  
Project Number: 157355.RR.A4.01

Order of Magnitude									Notes
Item	Description	Quantity	Units	Material Unit Cost	Labor & Equip	Total Unit Cost	Total		
7	Walker Road (northern portion)								
	Dike	2600	LF						
	Clear and Grub	2.3	ACRE	\$ -	\$ -	\$ 4,000.00	\$ 9,073		haul debris offsite
	Construct Access Road	800	SY	\$ 2.50	\$ 5.23	\$ 7.73	\$ 6,187		Assume gravel 4" depth 4" \$1.5/SY+\$1 geotextile and earthwork @
	Build Dike	11,074	CY	\$ 12.00	\$ 6.54	\$ 18.54	\$ 205,335		Assume 3 to 1 slope, @ 400 cy/day, allow for material cost
	Silt Fence & erosion control	2,600	LF	\$ -	\$ -	\$ 5.00	\$ 13,000		Erosion control along stream
	Hydroseed	10,978	SY	\$ -	\$ -	\$ 0.30	\$ 3,293		Subcontracted
	Detention Pond	-	SY						
	Clear and Grub	-	ACRE	\$ -	\$ -	\$ 4,000.00	\$ -		haul debris offsite
	Strip topsoil and stockpile	-	CY	\$ -	\$ 1.80	\$ 1.80	\$ -		Strip top 4" & Stockpile nearby, @ 2200 cy/day
	Silt Fence & erosion control	-	LS	\$ -	\$ -	\$ 1,000.00	\$ -		Erosion control, Allowance
	Excavate	-	CY	\$ -	\$ 1.80	\$ 1.80	\$ -		Assume @ 2200cy/day
	Place Topsoil	-	CY	\$ -	\$ 3.27	\$ 3.27	\$ -		Assume @ 800 cy/day
	Waste	-	CY	\$ -	\$ -	\$ 3.00	\$ -		haul waste offsite
	Hydroseed	-	SY	\$ -	\$ -	\$ 0.30	\$ -		Subcontracted
	Subtotal					\$ 236,888			
	CONTINGENCY	30%				\$ 71,066			
	SUBTOTAL					\$ 307,954			
	MOBILIZATION	10%				\$ 30,795			
	SUBTOTAL					\$ 338,749			
	SALES TAX	7.9%				\$ 26,761			
	TOTAL CONSTRUCTION COSTS					\$ 365,511			
	ENG., LEGAL & ADMIN	35.0%				\$ 127,929			
	TOTAL PROJECT COSTS (ROUNDED)					\$ 493,400			

NOTE: The above cost opinion is in January 2001 dollars and does not include escalation, construction management, financing, O&M or hazardous material mitigation costs.

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The final costs of the project will depend on actual labor and material costs, actual site conditions, actual site productivity, competitive market conditions, final project scope, final project schedule and other variable factors. As a result, the final project costs will vary from those presented above. Because of these factors, funding needs must be carefully reviewed prior to making specific financial decisions or establishing final budgets.

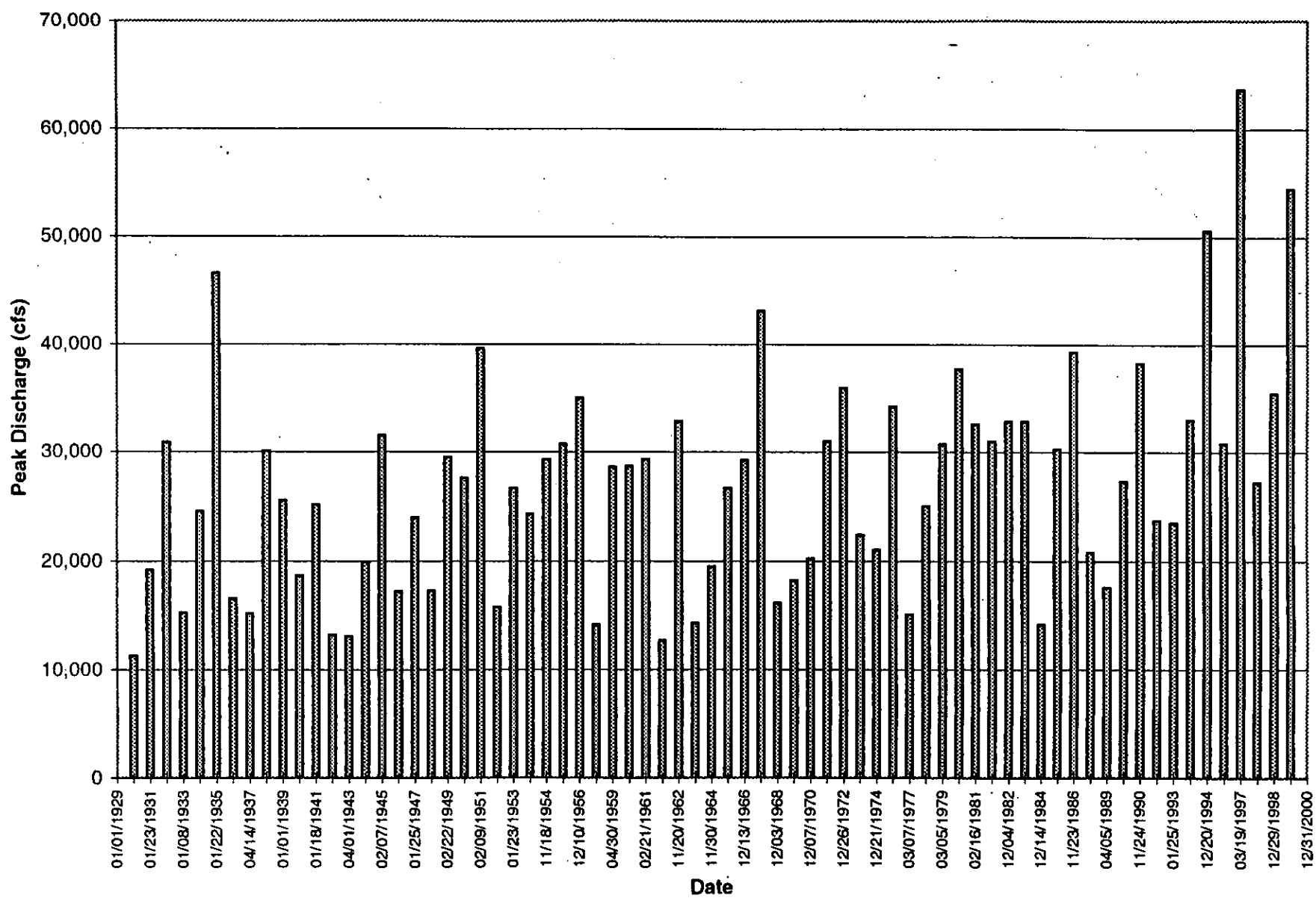


Figure 3- . Recorded Peak Discharge at USGS Gauge 12035000, Satsop River, near Satsop, 1929 to 1999

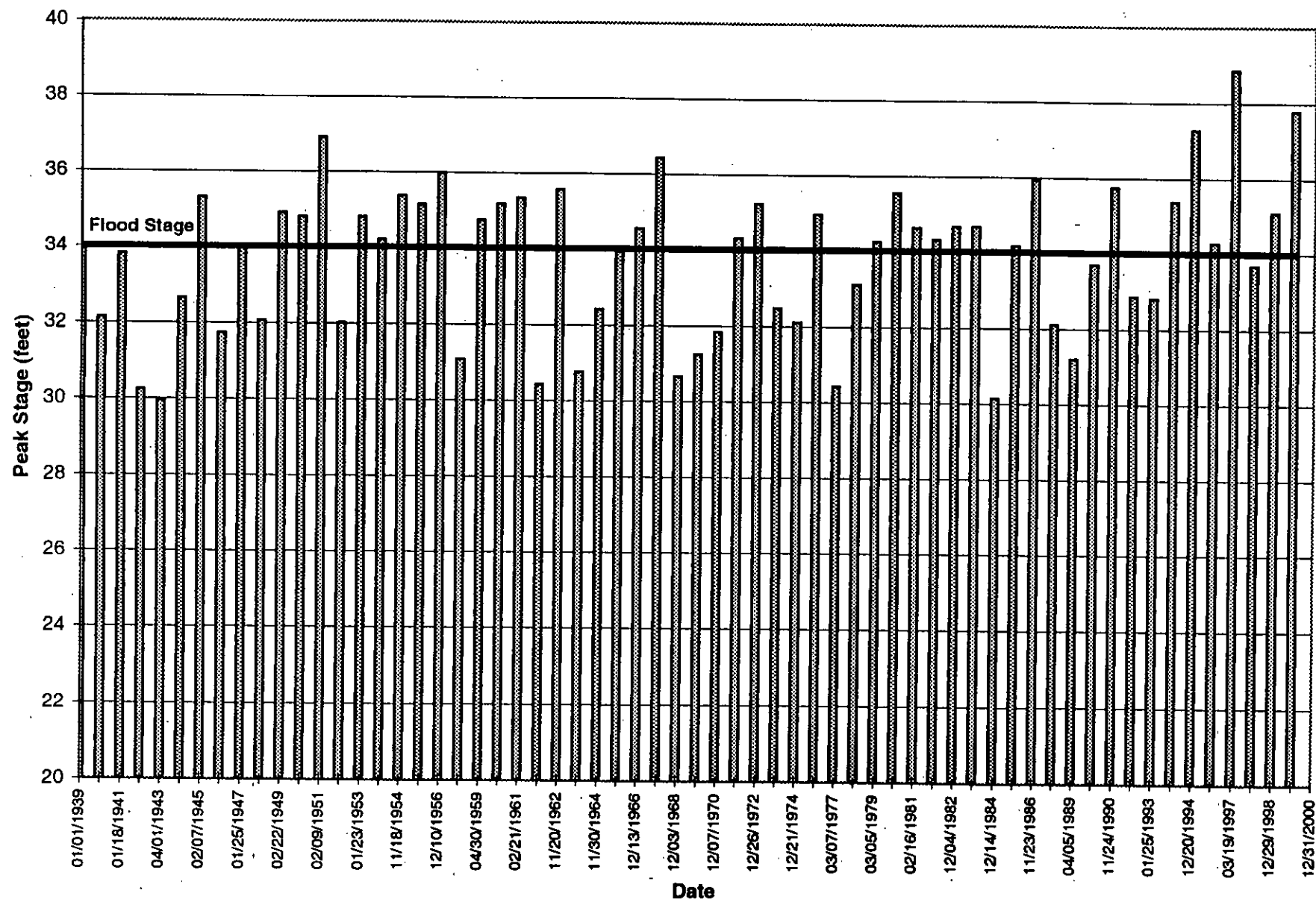


Figure 3- Recorded Peak Stage (Gauge Datum) at USGS Gauge 12035000, Satsop River, near Satsop, 1929 to 1999

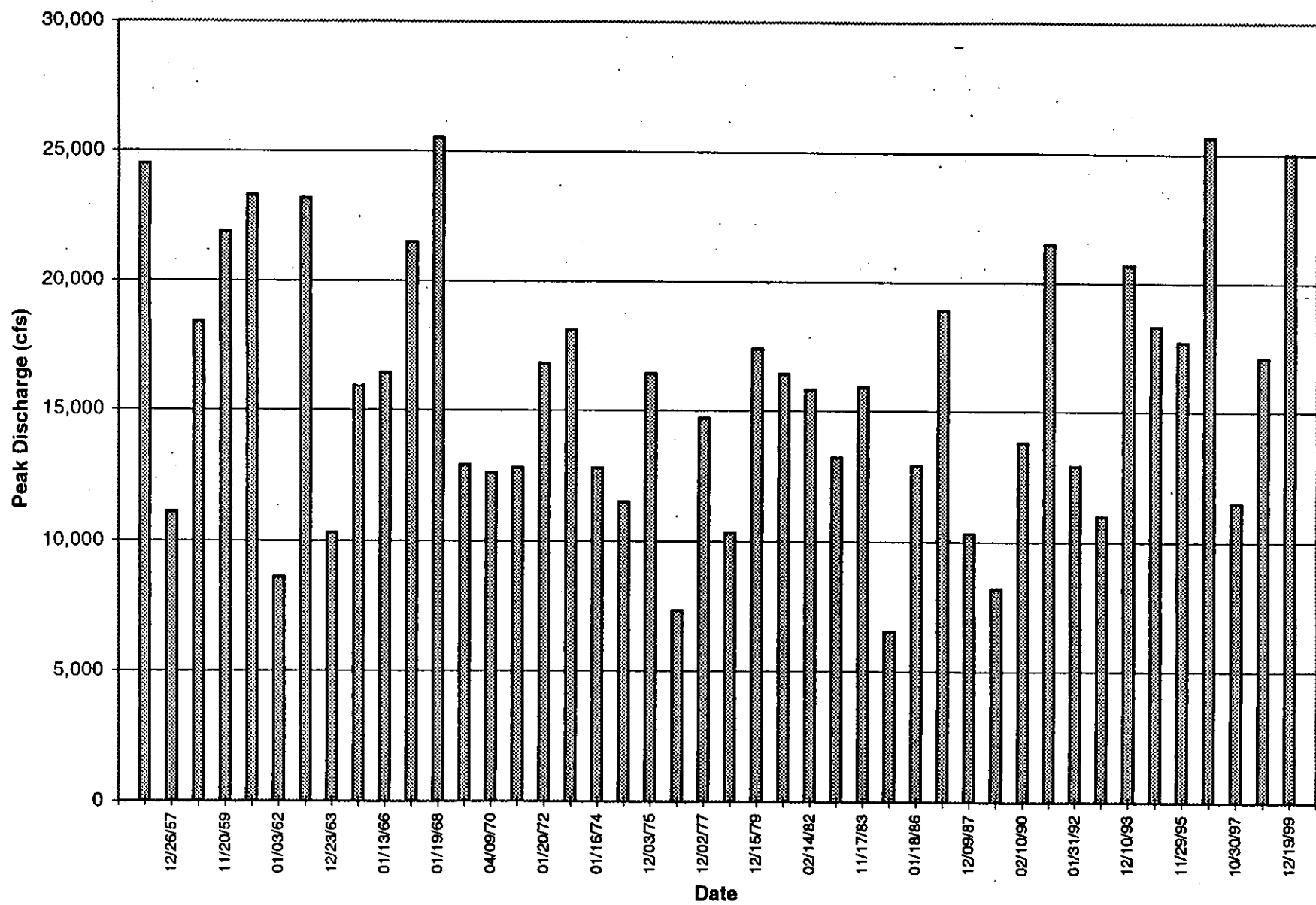


Figure 3-11. Recorded Peak Discharge (Gauge Datum) at USGS Gauge 12037400, Wynoochee River, Upstream of Black Creek, near Monetsano, 1956 to 1999

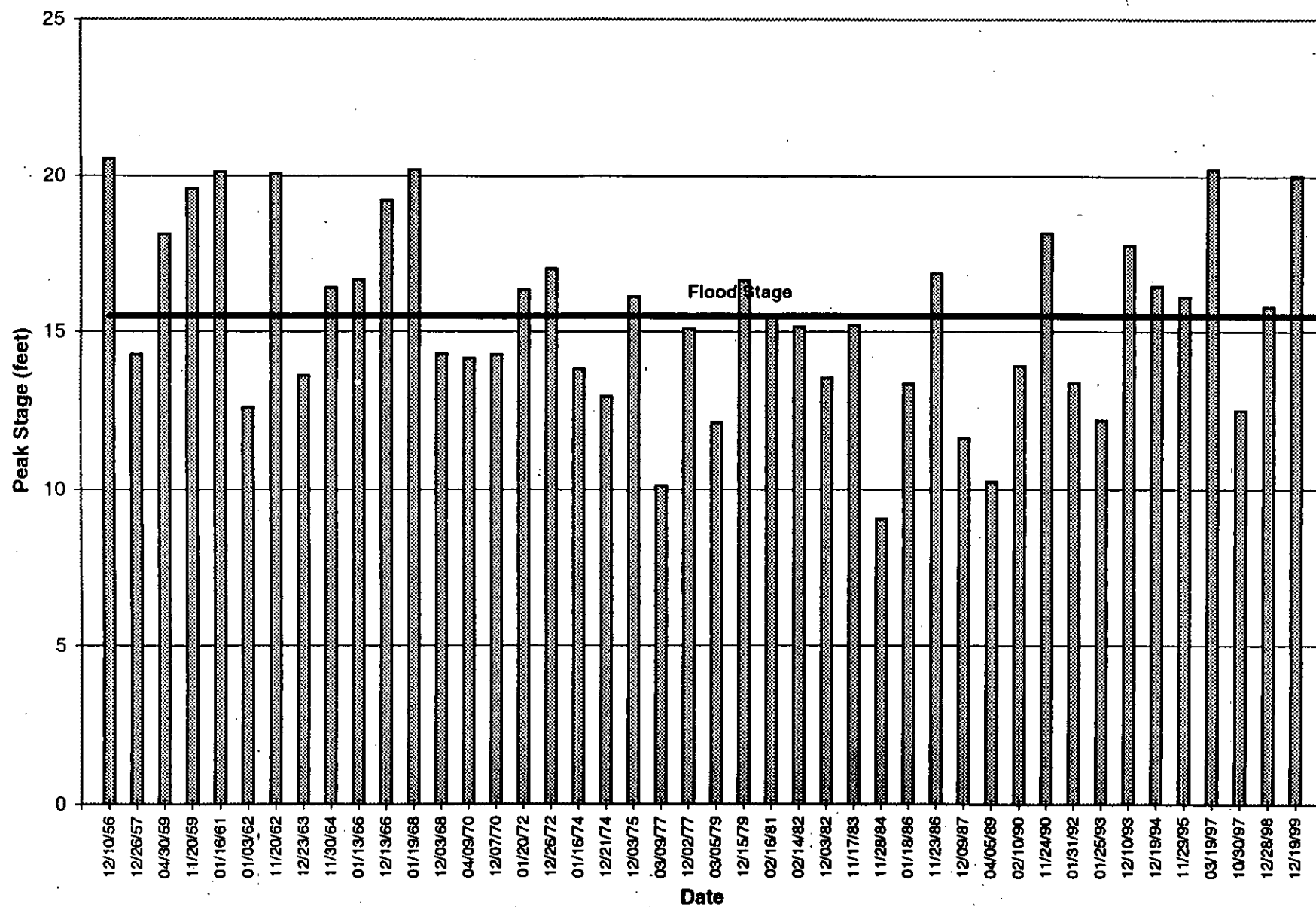


Figure 3-12. Recorded Peak Stage at USGS Gauge 12037400, Wynoochee River, upstream of Black Creek, near Montesano, 1956 to 1999



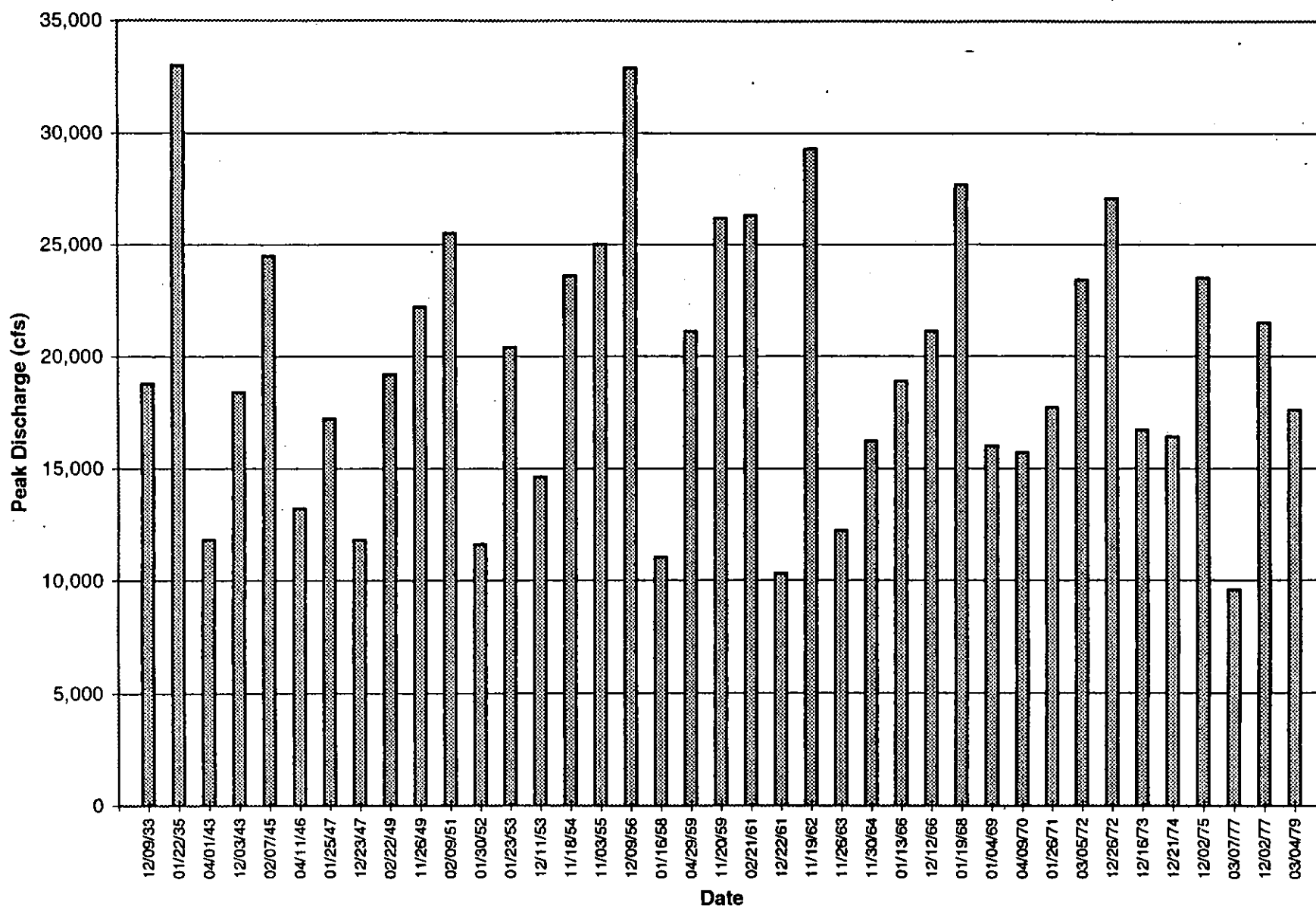
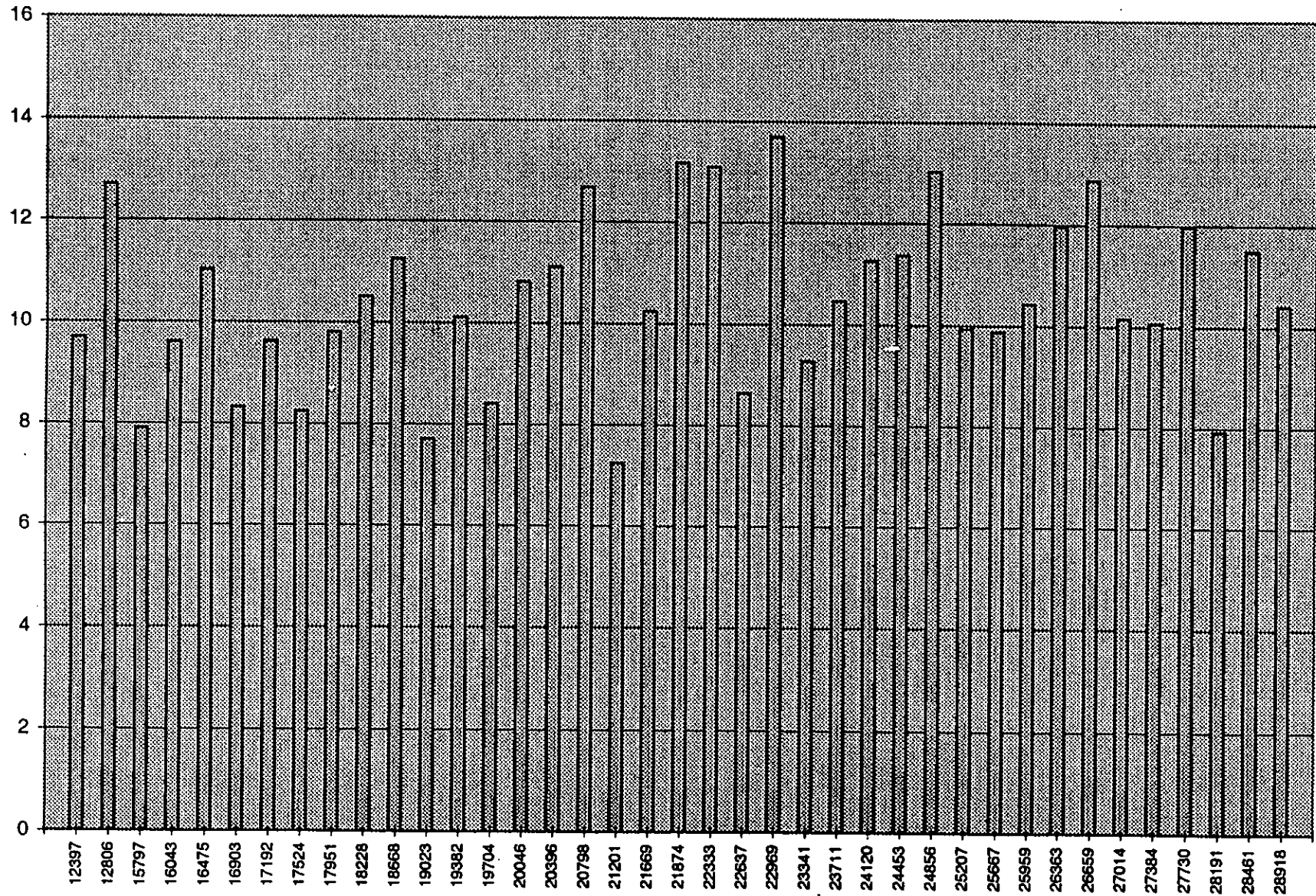


Figure 3- . Recorded Peak Discharge at USGS Gauge 12039000, Humptulips river, near Humptulips, 1933 to 1979

# HumptulipsPeakStage



# Addendum to the Final Comprehensive Flood Hazard Management Plan

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*NOTE: This addendum presents corrections to the 2001 Final Comprehensive Flood Hazard Management Plan (CFHMP) to include requirements of the FEMA Flood Mitigation Plan..*

This addendum presents chapter specific corrections, a summary of the FEMA Flood Mitigation Assistance Program, a description of the public and agency participation process, a record of historic events, prior flood control investigations, a characterization of current and past flood hazard areas, and next steps.

## Chapter Specific Corrections

### Chapter 4:

- p. 4-9: Replace Executive Order 90-40 with Executive Order 90-04. It should state the following:  
  
    **"Washington State Executive Order 90-04—Protection of Wetlands**  
    Executive Order 90-04 mandates that all state agencies rigorously enforce their existing authorities to protect wetland functions and values."
- p. 4-9: Replace RCW 75.20.100-103 with RCW 77.20.100-103. It should state the following:  
  
    **"Washington State Hydraulic Code (RCW 77.20.100-103; WAC 220-110)"**

## FEMA Flood Mitigation Plan

In Washington State, the State Emergency Management Department manages the Flood Mitigation Assistance program for FEMA. The County received flood mitigation assistance from the State Emergency Management Department to develop this CFHMP.

FEMA recommends the flood mitigation planning process include the following:

1. Public involvement.
2. Coordination with other agencies or organizations
3. Flood hazard area inventory.
4. Problem identification.
5. Review of possible mitigation actions
6. State or local adoption following a public hearing.

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## Public and Agency Participation Process

In keeping with Ecology's guidance for flood hazard management planning, the County has worked actively to involve members of the community in identifying flooding problems and advising on potential recommendations. Six public meetings were held in the preparation of this plan. All meetings were advertised in the Aberdeen Daily World and the Vidette local newspapers. In addition, repetitive loss property owners were sent letters inviting them to attend these public meetings. The list of these property owners was obtained from the Grays Harbor County Deputy Director of Emergency Management, who maintains a database of citizens who contact the office when their property is flooded.

Agency members that were represented at the various meetings included staff from the County, Ecology, COE, and WDFW.

## Record of Historic Events

Grays Harbor County is subject to chronic flooding. Floods that caused significant damage occurred in November 1949, February 1951, November 1954, November 1955, October 1962, December 1964, January 1968, January 1971, January 1972, December 1975, December 1977, December 1979, January 1990, November 1990, October-December 1994, November-December 1995, January-February 1996, December 1996-February 1997, March 1997, and December 1999. Two of the highest recorded peak flow events occurred during the 1990s.

## Prior Flood Control Investigations

This document is the fifth phase of a planning effort undertaken by Grays Harbor County. Several flood hazard management plans have been developed for more localized areas throughout the County (see Section 2, Figure 2-1). The Vance Creek, Grayland, South Beach, and North Beach areas were assessed for local flood damage. These previous study areas are delineated in Figure 2-1.

- Vance Creek-In 1994, the County prepared the Vance Creek Drainage Evaluation in and around the City of Elma. The Vance Creek flooding area is located adjacent to Calder Road just north of the Montesano-Elma Road. Creek flooding frequently impacts a residential area located immediately northeast of the intersection, and ranchettes located on the west side of Calder Road. On occasion, the creek overtops its banks and crosses the railroad tracks west of Calder Road and flows through the school grounds and disperses in both directions along the Monte-Elma Road.
- Grayland-In 1995, the County prepared the Grayland Flood Hazard Reduction Plan for the southern portion of the area, extending from Salt Aire Shores to a natural drainage boundary east of Grayland Beach Park. There are numerous locations throughout the planning area that are frequently inundated by flooding. The main flooding problems include nuisance flooding (garages and lawns), non-critical roadways, the bridge at Grange Road, sections of State Route 105, the roadway in front of the post office, and cranberry bogs. A few homes, south of the post office and west of the channel have been flooded. One home has been elevated above flood levels.

- South Coastal-In 1997, the County prepared the South Coastal Flood Hazard Reduction Plan, which covered an area from Salt Aire Shores north to Westport. The main flooding problems include nuisance flooding (garages and lawns), local roads, SR 105, and a number of properties.
- North Beach-In 1999, the County prepared the North Beach Flood Hazard Management Plan, which is located in a coastal strip between Conner Creek on the south and Copalis Beach on the north, and was a continuation of the systematic review of coastal flooding and drainage problems. The main flooding problems include Silver Maple Resort-Roosevelt Road, Haven by the Sea, a depressed area adjacent to Johnson Mercantile, and Rod's Resort.

These studies are appended to the comprehensive plan in order to submit a complete plan.

## Current and Past Flood Hazard Areas

Many residential properties, commercial and industrial properties, and roadways in Grays Harbor County are flooded during large storm events. The following sources were used to identify the extent of flooding within Grays Harbor County, with emphasis on the Wynoochee, Satsop, and Humptulips River Basins:

- FEMA flood insurance rate maps
- FEMA repetitive loss list
- Grays Harbor Emergency Management Office (GHEMO) repetitive loss list
- Community input from public meetings
- Grays Harbor County Public Works staff

Figure 5-1 (oversize map in sleeve) shows the compilation of flood problem areas identified from these sources.

The Federal Emergency Management Agency (FEMA) has a list of properties that are considered repetitive loss. Repetitive loss is defined as "two or more flood insurance claims for more than \$1,000 for the same structure over a 10-year period." These claims represent fewer than 2 percent of the policy base, but more than 35 percent of the claim payments.

In addition to the FEMA list, the Grays Harbor Emergency Management Office (GHEMO) has compiled a list of people who have suffered losses as a result of flooding from 1994 to the present. The GHEMO defines these properties as repetitive loss also, although they do not meet the strict definition of repetitive loss given by FEMA. The majority of the estimates of flood damage that resulted from the December 1999 flood were between \$2,500 and \$35,000. Figure 5-1 shows the location of the GHEMO repetitive loss properties. The County and GHEMO office have a copy of this database.

The extent of flooding and flood risk throughout the river basins became apparent at four public meetings that were conducted during the CFHMP process. Community members were asked to draw on maps to show where and when their properties were flooded. Figure 5-1 shows the areas that community members identified as having flooding and erosion problems.

County Public Works staff were another source that was used to identify flood-prone areas. They helped identify flood areas by personal recollection and other records (e.g., maps and survey information). The flood areas identified by Public Works staff are shown in Figure 5-1. Because the primary focus of Public Works staff is within County right-of-way areas, the majority of the problem areas they identified are typically roadways. Figure 5-2 shows many of the roadways that are subject to road closures during flood events. During the March 1997 event, many people in the City of Montesano were stranded because Highway 12 was inaccessible. During the December 1999 event, the Humptulips Dike Road was closed for 3 months because the dike failed. During both events, numerous residents with homes along the Wynoochee, Satsop, and Humptulips Rivers were stranded.

There are numerous areas throughout the County that are subject to flooding; however, this plan focuses on the Wynoochee, Satsop, and Humptulips River Basins. Other problem areas have been identified in the Flood Hazard Management Plans mentioned previously. The following areas within these basins were identified as subject to chronic flooding:

#### General

- Repetitive loss properties - According to FEMA, there are approximately 6 homes on the FEMA repetitive loss list for Grays Harbor County.

#### Wynoochee River Basin

- The greater Wynoochee River Basin excludes area specific flooding, like the Wynoochee Tracts and Geissler Road. In this area, there are approximately 20 homes on the GHEMO repetitive loss list. Local residents and County staff have observed flood depths up to 6-ft above ground level at/or near homes and property. Damage potential is approximately \$1,314,371 (defined as 75% of the assessed home and land value).
- Wynoochee Tracts is located in the Wynoochee River Valley west of Wynoochee Valley Road and about 1,000 feet north of U.S. Route 12. This area is currently outside of the mapped floodplain as shown on the Flood Insurance Rate Maps (FIRM) published by FEMA. The Washington State Department of Transportation recently purchased 6 of the homes and intends to purchase the remaining home on the GHEMO repetitive loss list. Before the transfer of ownerships the damage potential was approximately \$151,316 (defined as 75% of the assessed home and land value).
- Geissler Road is located in the Wynoochee River Valley. In this area, there are approximately 9 homes (1 agricultural building, 6 site built, and two manufactured homes) on the GHEMO repetitive loss list. Local residents and County staff have observed flood depths up to 3-ft above ground level at/or near homes and property. Damage potential is approximately \$1,315,481 (defined as 75% of the assessed home and land value).

#### Satsop River Basin

- The greater Satsop River Basin excludes area specific flooding, like the Satsop Riviera and Monte-Elma road near Brady. In this area, there are approximately 31 homes on the GHEMO repetitive loss list. Local residents and County staff have observed flood depths up to 10-ft above ground level at/or near homes and property. Damage potential is approximately \$2,629,298 (defined as 75% of the assessed home and land value).

- Satsop Riviera is located in the Satsop River basin. The Satsop Riviera is a development in the mapped floodplain. In this area, there are approximately 18 parcels (2 accessory buildings, 12 manufactured and 3 site built homes) on the GHEMO repetitive loss list. Local residents and County staff have observed flood depths up to 3-ft above ground level at/or near homes and property. Damage potential is approximately \$358,598 (defined as 75% of the assessed home and land value).
- Monte-Elma Road in Brady is located in the Satsop River basin. In this area, there are approximately 13 homes (12 site built and 1 manufactured) on the GHEMO repetitive loss list. Local residents and County staff have observed flood depths up to 9.5-ft above ground level at/or near homes and property. Damage potential is approximately \$640,028 (defined as 75% of the assessed home and land value).

#### Humptulips River Basin

- The greater Humptulips River Basin excludes area specific flooding, like the Humptulips Dike Road and Walker Bottom area. In this area, there are approximately 17 parcels (11 site built, 1 modular, 4 manufactured and 1 agricultural building) on the GHEMO repetitive loss list. Local residents and County staff have observed flood depths up to 1-ft above ground level at/or near homes and property. Damage potential is approximately \$666,004 (defined as 75% of the assessed home and land value).
- The Humptulips Dike Road area is located in the Humptulips River basin where Humptulips Dike Road crosses the Humptulips River. This area is partially outside of the mapped floodplain as shown on the FIRM published by FEMA. Some homes and properties have been flooded. Local residents and County staff have observed flood depths up to 2-ft above ground level at/or near homes and property.
- The Walker Bottom Area is located in the Humptulips River basin in the vicinity of Walker Bottom Road. This area is adjacent to the mapped floodplain as shown on the FIRM published by FEMA. In this area, there are approximately 6 homes (2 site built and 4 manufactured) on the GHEMO repetitive loss list. Damage potential is approximately \$211,755 (defined as 75% of the assessed home and land value). Additionally 10 other homeowners reported at the public meetings that flooding occurred near their property and varied in elevation from flood depths 1-ft to 5-ft above ground level.

## **Next Steps**

The planning process to develop this CFHMP allowed the County to further identify some of the chronic flooding problems within Grays Harbor County, specifically in the Wynoochee, Satsop, and Humptulips River Basins. The County recognizes that there are more properties that are flooded on a chronic basis that have not been identified in this or previous plan. It is the intent of the County that all properties with flooding issues be considered inclusive to the CFHMP.

The County does not currently have the resources to fund the projects described in Section 7 of this plan; however, the County will continue to try to obtain funding in order to implement structural and nonstructural projects as needed. If capital projects are not implemented due to lack of County and/or Special Purpose Districts funds the option is still

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available for citizens to be eligible for funding individual projects through sources such as the FEMA Flood Mitigation Assistance program.



# Wynoochee Repetitive Loss Areas

DATA OBTAINED FROM COUNTY EMERGENCY MANAGEMENT OFFICE. (through August 2000)

Repetitive Loss Data: The list below includes people who contacted the Emergency Management group in the sheriff's office after floods struck their homes. They need flood issues addressed. Most of the claims were between \$2500-\$35,000 in losses.

Majority of floods have not reached the Federal Disaster Level and homeowners have had to use personal funds, since many do not have flood insurance.

Parcel Number	Flood Date	Flood Date	Flood Date	Land Value	Building Value	Damage Potential	Situs Address
170802120040		3/26/97		73380	82190	\$61,643	00237 WYNOOCHE VALLEY RD WYNO
170802130030		3/24/97		25000	94025	\$70,519	00204 WYNOOCHE VALLEY RD WYNO
170802130040		3/24/97		20000	76465	\$57,349	00198 WYNOOCHE VALLEY RD WYNO
170802140020		3/23/97		35000	116750	\$87,563	00174 WYNOOCHE VALLEY RD WYNO
170802310010		3/26/97		50800	135540	\$101,655	00106 WEST WYNOOCHE RD WYNO
170802440040	12/15/99	3/22/97		10000	3425	\$2,569	00111 WYNOOCHE VALLEY RD WYNO
170811210010		3/31/97		30000	76710	\$57,533	00048 WEST WYNOOCHE RD WYNO
180809220020		3/27/97		4515	62445	\$46,834	01289 WYNOOCHE VALLEY RD WYNO
180814230010			12/12/95	25000	47035	\$35,276	00676 WILKIE LN WYNO
180821330020		3/26/97		30000	50915	\$38,186	00546 GEISSLER RD WYNO
180826330030	12/15/99	3/21/97		47580	110040	\$82,530	00484 WYNOOCHE VALLEY RD WYNO
180828130050		3/31/97		30000	119145	\$89,359	00741 WYNOOCHE VALLEY RD WYNO
180835430010		3/23/97		15000	21430	\$16,073	00281 WYNOOCHE VALLEY RD WYNO
190811330010		3/24/97		22877	71010	\$53,258	00032 MATZEN RD WYNO
190811340010		3/21/97		15000	40795	\$30,596	00048 MATZEN RD WYNO
190814240000	12/15/99			24463	90405	\$67,804	00090 WHEELER RD WYNO
190814240000	12/15/99			24463	90405	\$67,804	00090 WHEELER RD WYNO
190822110000	12/15/99			97317	232475	\$174,356	01975 WYNOOCHE VALLEY RD WYNO
190832440010		3/27/97		25415	115645	\$86,734	00106 OLD WYNOOCHE RD WYNO
190832440010	12/15/99			25415	115645	\$86,734	00106 OLD WYNOOCHE RD WYNO
Total Damage Potential						\$1,314,371	

# Geissler Repetitive Loss Areas

DATA OBTAINED FROM COUNTY EMERGENCY MANAGEMENT OFFICE. (through August 2000)

Repetitive Loss Data: The list below includes people who contacted the Emergency Management group in the sheriff's office after floods struck their homes. They need flood issues addressed. Most of the claims were between \$2500-\$35,000 in losses.

Majority of floods have not reached the Federal Disaster Level and homeowners have had to use personal funds, since many do not have flood insurance.

Parcel Number	Flood Date	Flood Date	Land Value	Building Value	Damage Potential	Situs Address	
180821330020		3/26/97	30000	50915	\$38,186	00546 GEISSLER RD	WYNO
180828220010		3/23/97	183900	687000	\$515,250	00530 GEISSLER RD	WYNO
180828340010		3/21/97	50000	102780	\$77,085	00388 GEISSLER RD	WYNO
180833140010	12/15/99	3/24/97	63680	153355	\$115,016	00246 GEISSLER RD	WYNO
180834110020		3/24/97	14322	90775	\$68,081	00064 GEISSLER RD	WYNO
180834110030		3/24/97	25000	118355	\$88,766	00043 GEISSLER RD	WYNO
180834210010		3/23/97	64000	218105	\$163,579	00178 GEISSLER RD	WYNO
180834210020		3/23/97	3696	233420	\$175,065	00158 GEISSLER RD	WYNO
180835220010	12/15/99	3/22/97	25000	99270	\$74,453	00032 GEISSLER RD	WYNO
Total Damage Potential					\$1,315,481		

# Wynoochee Tracts Repetitive Loss Areas

DATA OBTAINED FROM COUNTY EMERGENCY MANAGEMENT OFFICE. (through August 2000)

Repetitive Loss Data: The list below includes people who contacted the Emergency Management group in the sheriff's office after floods struck their homes. They need flood issues addressed. Most of the claims were between \$2500-\$35,000 in losses.

Majority of floods have not reached the Federal Disaster Level and homeowners have had to use personal funds, since many do not have flood insurance.

Parcel Number	Flood Date	Flood Date	Land Value	Building Value	Damage Potential	Situs Address
834500700001	12/15/99	3/22/97	25000	43475	\$32,606	00040 WYNOOCHE TRACTS RD WYNO
834500700002	12/15/99	3/21/97		8855	\$6,641	00038 WYNOOCHE TRACTS RD WYNO
834500700002		3/21/97		8855	\$6,641	00038 WYNOOCHE TRACTS RD WYNO
834500800000	12/15/99	3/20/97 3/24	30000	80530	\$60,398	00044 WYNOOCHE TRACTS RD WYNO
834501300001	12/15/99	3/20/97	25000	20450	\$15,338	00052 WYNOOCHE TRACTS RD WYNO
834502000000		3/25/97	25000	32285	\$24,214	00060 WYNOOCHE TRACTS RD WYNO
Total Damage Potential					\$145,838	

# Satsop Repetitive Loss Areas

DATA OBTAINED FROM COUNTY EMERGENCY MANAGEMENT OFFICE. (through August 2000)

Repetitive Loss Data: The list below includes people who contacted the Emergency Management group in the sheriff's office after floods struck their homes. They need flood issues addressed. Most of the claims were between \$2500-\$35,000 in losses.

Majority of floods have not reached the Federal Disaster Level and homeowners have had to use personal funds, since many do not have flood insurance.

Parcel Number	Flood Date	Flood Date	Flood Date	Land Value	Building Value	Damage Potential	Situs Address
170701120010		3/27/97		7048	101480	\$76,095	00111EBRADY LOOP RD BRAD
170701120020		3/20/97		25000	62410	\$46,808	00115EBRADY LOOP RD BRAD
170701120030		3/24/97		25000	121355	\$91,016	00119EBRADY LOOP RD BRAD
170701140070		3/24/97		20000	37955	\$28,466	00051 HIRAM HALL RD BRAD
170701220010		3/24/97		35850	83150	\$62,363	00064EBRADY LOOP RD BRAD
170701420040		3/26/97		25000	59935	\$44,951	00028 HIRAM HALL RD BRAD
170701430010				4463	139020	\$104,265	00239EBRADY LOOP RD BRAD
170712110030		3/24/97		25000	40510	\$30,383	00271EBRADY LOOP RD BRAD
170712110040		4/1/97		25000	79450	\$59,588	00273EBRADY LOOP RD BRAD
170712120020		3/26/97		25000	113815	\$85,361	00269EBRADY LOOP RD BRAD
170712130030	12/15/99			933	119100	\$89,325	00032 WILLIS RD BRAD
170712140010		3/22/97		15944	142685	\$107,014	WILLIS RD BRAD
170712420000		4/1/97		25547	136480	\$102,360	00369EBRADY LOOP RD BRAD
180606210000		3/24/97		53841	72110	\$54,083	00434 MIDDLE SATSOP RD S.VA
180606310020		3/28/97		5081	180535	\$120,401	00466 MIDDLE SATSOP RD S.VA
180703310030	12/15/99			16140	27185	\$20,389	01056 WEST SATSOP RD S.VA
180703310040	12/15/99	3/26/97		20130	38975	\$29,231	01060 WEST SATSOP RD S.VA
180703310060		3/28/97		27000	64405	\$48,304	01022 WEST SATSOP RD S.VA
180710430010		3/28/97		105300	154515	\$115,886	00732 WEST SATSOP RD S.VA
180711210070		3/31/97		10003	185475	\$139,106	00126SSCHAFFER MEADOWS LN S.VA
180712110010		3/28/97		33459	193820	\$145,365	00912 MIDDLE SATSOP RD S.VA
180723120000		4/1/97		111033	114690	\$86,018	00471 EAST SATSOP RD E.SA
180723420000		3/24/97		18247	453990	\$340,493	00383 EAST SATSOP RD E.SA
180726420010		3/20/97		25000	77910	\$58,433	00048 CASCADE DR S.VA
180735430060			12/12/95	30000	123240	\$92,430	00020WBARRETT RD BRAD
180736320020		3/22/97		78540	275065	\$206,299	00038 MIDDLE SATSOP RD BRAD
190728430060		3/26/97		30000	8000	\$6,000	01365 WEST SATSOP RD S.VA
190733130020		3/26/1997	3/2	25020	12165	\$9,124	01303 WEST SATSOP RD S.VA
190733410080	1994			17280	19195	\$14,396	01232 WEST SATSOP RD S.VA
190733440010	12/15/99			17280	29280	\$21,960	01226 WEST SATSOP RD S.VA
190736410010		3/21/97		15000	4095	\$3,071	01140 MIDDLE SATSOP RD S.VA
Total Damage Potential						\$2,438,981	

# Satsop Riviera Repetitive Loss Areas

DATA OBTAINED FROM COUNTY EMERGENCY MANAGEMENT OFFICE. (through August 2000)

Repetitive Loss Data: The list below includes people who contacted the Emergency Management group in the sheriff's office after floods struck their homes.

They need flood issues addressed. Most of the claims were between \$2500-\$35,000 in losses.

Majority of floods have not reached the Federal Disaster Level and homeowners have had to use personal funds, since many do not have flood insurance.

Parcel Number	Flood Date	Flood Date	Flood Date	Land Value	Building Value	Damage Potential	Situs Address
812001200000		3/24/97		12000	44730	\$33,548	00183 SATSOP RIVIERA LOO E.SA
812001600000		3/21/97	1994	5000	19470	\$14,603	00161 SATSOP RIVIERA LOO E.SA
812001700000		3/23/97		5000	20525	\$15,394	00159 SATSOP RIVIERA LOO E.SA
812002100000		3/23/97	1994	5000	25875	\$19,406	00149 SATSOP RIVIERA LOO E.SA
812002300000	12/15/99			5000	8000	\$6,000	00143 SATSOP RIVIERA LOO E.SA
812003200000		4/3/97		5000	18285	\$13,714	00121 SATSOP RIVIERA LOO E.SA
812003300000		3/23/97		5000	39825	\$29,869	00119 SATSOP RIVIERA LOO E.SA
812004600000	12/15/99	3/24/97		7500	64285	\$48,214	00081 SATSOP RIVIERA LOOP E.SA
812005400000		3/21/97	1994	5000	29905	\$22,429	00055 SATSOP RIVIERA LOOP E.SA
812006600000		3/31/97		12000	30560	\$22,920	00021 SATSOP RIVIERA LOO E.SA
812007100000		3/23/97		5000	35760	\$26,820	00030 SATSOP RIVIERA LOO E.SA
812007200000		3/23/97		5000	13200	\$9,900	00040 SATSOP RIVIERA LOO E.SA
812008100000		4/1/97		5000	11630	\$8,723	00104 SATSOP RIVIERA LOO E.SA
812008600000		3/23/97		5000	11360	\$8,520	00148 SATSOP RIVIERA LOOP E.SA
812008700000		4/3/97		5000	22845	\$17,134	00168 SATSOP RIVIERA LOOP E.SA
812008800000		3/21/97		5000	20135	\$15,101	00176 SATSOP RIVIERA LOOP E.SA
812009200000		3/27/97	1994	5000	45310	\$33,983	00196 SATSOP RIVIERA LOOP E.SA
812009300000		3/23/97		5000	16430	\$12,323	00206 SATSOP RIVIERA LOO E.SA
Total Damage Potential						\$358,598	

# Monte - Elma Road Repetitive Loss Areas

DATA OBTAINED FROM COUNTY EMERGENCY MANAGEMENT OFFICE. (through August 2000)

Repetitive Loss Data: The list below includes people who contacted the Emergency Management group in the sheriff's office after floods struck their homes. They need flood issues addressed. Most of the claims were between \$2500-\$35,000 in losses.

Majority of floods have not reached the Federal Disaster Level and homeowners have had to use personal funds, since many do not have flood insurance.

Parcel Number	Flood Date	Flood Date	Flood Date	Land Value	Building Value	Damage Potential	Situs Address
180631130010			12/12/95	30000	107905	\$80,929	00869 MONTE ELMA RD SATS
180736130000			12/12/95	21722	44385	\$33,274	00683 MONTE ELMA RD BRAD
180736330100	12/15/99	3/22/97		15000	80110	\$60,083	00668 MONTE ELMA RD BRAD
180736410020		3/28/97		30000	79440	\$59,580	00712 MONTE ELMA RD BRAD
180736420010		3/27/97		20000	87555	\$85,666	00715 MONTE ELMA RD BRAD
180736420020		3/23/97		24750	82830	\$62,123	00709 MONTE ELMA RD BRAD
180736420030		3/21/97		15000	99625	\$74,719	00689 MONTE ELMA RD BRAD
180736420040		3/24/97		12500	33320	\$24,990	00682 MONTE ELMA RD BRAD
713500100000		3/22/97		35000	70590	\$52,943	00681 MONTE ELMA RD BRAD
713500200000		3/21/97		17500	9320	\$6,990	00673 MONTE ELMA RD BRAD
713500300000	12/15/99	3/23/97	1994	17500	16160	\$12,120	00661 MONTE ELMA RD BRAD
713500400001	12/15/99	3/20/97	1994	25000	42995	\$32,246	00655 MONTE ELMA RD BRAD
713500500000		3/22/97		14619	99155	\$74,366	00625 MONTE ELMA RD BRAD
Total Damage Potential						\$640,028	

# **Humtullips Repetitive Loss Areas**

DATA OBTAINED FROM COUNTY EMERGENCY MANAGEMENT OFFICE. (through August 2000)

Repetitive Loss Data: The list below includes people who contacted the Emergency Management group in the sheriff's office after floods struck their homes.

They need flood issues addressed. Most of the claims were between \$2500-\$35,000 in losses.

Majority of floods have not reached the Federal Disaster Level and homeowners have had to use personal funds, since many do not have flood insurance.

Parcel Number	Flood Date	Flood Date	Flood Date	Flood Date	Land Value	Building Value	Damage Potential	Situs Address	Structure Type
181103310010		3/27/97			27020	48485	\$36,364	01062 OCEAN BEACH RD NEWT	site built
181115210010		3/24/97			50000	89210	\$66,908	00101 POWELL RD NEWT	site built
191001230100		4/3/97			15000	63615	\$47,711	00036 POLSON CAMP RD AXFO	site built
191128340010		3/22/97			72140	28480	\$21,360	01518 OCEAN BEACH RD C.CR	site built
191128340020		3/20/97			12000	30535	\$22,901	01536 OCEAN BEACH RD C.CR	manufactured
191128440020		3/24/97			23375	48370	\$36,278	00092 HUMPTULIPS VALLEY RD NEWT	manufactured
191133420010		3/23/97			25000	27440	\$20,580	01356 OCEAN BEACH RD NEWT	site built
201016220010		3/24/97			40180	61185	\$45,889	00265 EAST HUMPTULIPS RD AXFO	modular
201018100000	12/15/99				154200	17400	\$13,050	00100 HANSON RD AXFO	site built
201027340050	12/15/99				12000	5400	\$4,050	00018 CEDAR MILL LN AXFO	manufactured
759500000701	12/15/99				16875	60335	\$45,251	00019 ROBERTSON SCHOOL RD NEWT	site built
760000000100	12/15/99				12051	30430	\$22,823	00112 ORTON LN N.BA	manufactured
760000003000		3/24/97			41150	181815	\$136,361	01398 STATE RT 109 N.BA	site built
762001600000		3/21/97	1994		15160	86555	\$64,916	00047 TULIPS RD NEWT	site built
762003000000		3/22/97			28750	51030	\$38,273	00017 TULIPS RD NEWT	site built
762003100000				1994	13065	1000	\$750	00121 ROBERTSON RD NEWT	agricultural
762004500000		3/21/97			36150	56720	\$42,540	00055 ROBERTSON RD NEWT	site built
Total Damage Potential							\$666,004		

# Walker Bottom Repetitive Loss Areas

DATA OBTAINED FROM COUNTY EMERGENCY MANAGEMENT OFFICE. (through August 2000)

Repetitive Loss Data: The list below includes people who contacted the Emergency Management group in the sheriff's office after floods struck the They need flood issues addressed. Most of the claims were between \$2500-\$35,000 in losses.

Majority of floods have not reached the Federal Disaster Level and homeowners have had to use personal funds, since many do not have flood ins

Parcel Number	Flood Date	Flood Date	Land Value	Building Value	Damage Potential	Situs Address
191101210010	12/15/99		66470	28550	\$21,413	00675 WALKER RD AXFO
191101220040	12/15/99		25050	66595	\$49,946	00664 WALKER RD AXFO
201125330010		3/24/97	78636	57175	\$42,881	00476 WALKER RD AXFO
201135140020	12/15/99	3/21/97	8000	55540	\$41,655	00547 WALKER RD AXFO
201136230020		3/27/97	29550	42365	\$31,774	00577 WALKER RD AXFO
201136330010	12/15/99		17875	32115	\$24,086	00621 WALKER RD AXFO
Total damage potential					\$211,755	