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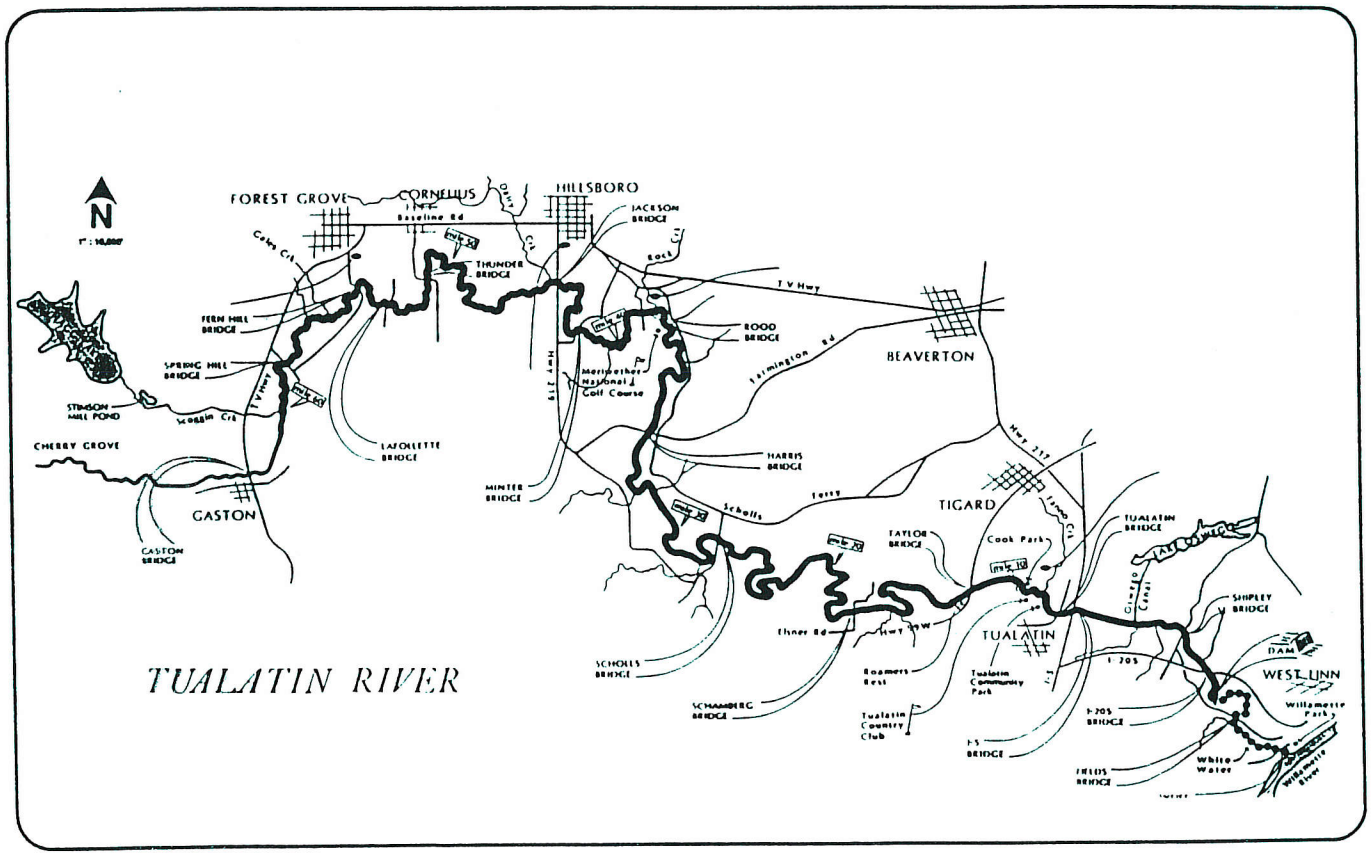
Farm and Forestry Operation Survey of Water Quality Issues Dairy-McKay Hydrologic Unit Area Washington County Oregon

Spring, 1992



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July, 1993

Farm and Forestry Operation Survey of Water Quality Issues

Dairy-McKay Hydrologic Unit Area
Washington County
Oregon

Spring, 1992

by

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Summary

Oregon State University Extension Service (ES) is responsible for the information and education portion of the USDA Dairy-McKay Hydrologic Unit Area (HUA) Project to reduce rural non-point source pollution. Approximately 2,700 people own farm and forest land in the 165,000 acre project area. The ES conducted a phone survey of 298 landowners in the HUA to determine knowledge and implementation of water quality management practices. Producers, when asked to describe themselves, chose 178 as farmers and 120 as foresters. The respondents were polled for information on:

Acreage, crops, and operation
Stream, roadway, soil, irrigation, and septic system management
Livestock and waste management
Water quality projects and agencies
Public perception
Demographics

The HUA is an agriculturally diverse, high-production farm and forest region. Knowledge and implementation of water quality management practices was high, with the exception of animal waste management by non-commercial animal owners. Some owners know that water quality project help is available. Awareness of the HUA project and designated, specific agency assistance was quite low. A notable number from the farming sector rated the agency assistance as unsatisfactory. Many of the respondents don't perceive a water quality problem in their area.

The ES needs to increase awareness of the issue of water quality, potential animal waste problems; what the HUA is; and where agency assistance is available. Successful voluntary water quality management programs have an effective education and information component.

Study Need

In 1990, the United States Department of Agriculture (USDA) agreed to fund a Hydrologic Unit Area (HUA) in Washington County, Oregon. This HUA was designed to incorporate three USDA agencies (Soil Conservation Service [SCS], Agricultural Stabilization and Conservation Service [ASCS], and Cooperative Extension Service) working together to help solve the problem of the phosphorous-impacted Tualatin River. In its broadest sense, the Oregon State University Extension Service (ES) is to provide education and information to citizens and landowners in the HUA, the SCS is to provide technical assistance for best management practices aimed at curbing problems, and the ASCS is to provide cost-sharing dollars to implement these ideas and practices.

The Dairy/McKay Creeks HUA organized itself in a manner which brought the three USDA agencies together along with other agencies and organizations to guide outputs. The Interagency Action Committee is a loose coalition of members with job assignments in the HUA, from ES, SCS, ASCS, the Washington County Soil and Water Conservation District, the Oregon Department of Forestry, the Oregon Department of Agriculture, and the Oregon Department of Environmental Quality.

Early on, it became apparent that in a complex County like Washington County the needs, desires, and expectations of landowners, home owners, farmers, woodlot owners, hobby farmers/ranchers, and citizens in general would be diverse. We also recognized that the knowledge base that each of these citizens held was widely divergent. But, we did not know exactly how, why, or where each would be positioned. It became apparent to the Task Group that a survey of landowners across the HUA would be very useful in guiding programs and ultimately in measuring the degree of success which these programs enjoy.

With the help and encouragement of the Action Committee, the ES undertook the survey.

Farm Question Responses

Acreage and Crops

In the first section of the survey the respondents were asked questions about acres owned, leased, farmed, and grazed. Residents were polled for the types of crops grown, with consideration for diversified farming.

- The largest farm operation was 2,600 acres with the average size at 112 acres; 75 acres was the largest area in pasture; with 15 acres the average size.

- One-third (31%) own from 5 to 24 acres, and a second one-third (29%) own 25 to 49 acres.

- The longest period owning or operating a farm was 75 years; the shortest 1 year; and the average, 24 years.

- More than one-third (39%) lease out crop pasture land to someone else, and 23% in turn lease land.

- Of the respondents, 63% raise grain, forage, or seed crops; 52% have orchards, small fruits, or vegetables; 24% are also raising Christmas trees or practice forestry; 4% of the group raise bare root or container nursery crops.

Stream, Roadway, Soil, Irrigation, and Septic System Management

The respondents were questioned about stream or river banks on their property, and any management measures. They were polled for similar information on road cuts or embankments, soil erosion control, irrigation management, and septic system maintenance.

- A majority (59%) of the farms have continuous running streams or rivers through them; 5.5 miles was the longest water course; 100 feet (.02 mile) the shortest; and .75 mile the average.

- One-third (30%) of those with streams or rivers have installed bank protection on their property. About equal numbers (41% and 45%) had installed riprap or planted grass to protect the banks; 18% have installed fencing to keep livestock out.

- One-fourth have road cuts or embankments on their property; 2.5 miles was the longest roadway and .3 mile the average. Almost all (91%) were more than two years old. One-fourth (25%) of the roadways have erosion control measures.

Water Quality Projects and Agencies

The respondents were questioned about the HUA, where to get information for water quality projects, and help with projects. Have they received help, what for, and their opinion of that help?

- Slightly more than one-third (36%) knew that they owned land within the HUA.

- Those surveyed were asked where to go to get information on improving water quality in their streams. One-third (34%) said the OSU Extension Service (OSU ES). About an equal number (16% and 18%) said the Watermaster/county water agencies or the USDA Soil Conservation Service (SCS). The USDA Agricultural, Stabilization and Conservation Service (ASCS) was mentioned 11% of the responses.

- They were asked where to get planning or financing for water quality projects. One-third (35%) mentioned the ASCS ; 25% said the SCS. The OSU ES was mentioned by 20% of the respondents.

- Over one-half (56%) of the respondents said that farmers could get planning or financing for water quality projects on their farms.

- One-third (31%) have used agency help with planning or financing such projects.

- One-third (33%) of the projects were for minimal waste management systems; 16% had installed drain tile, catch basins, or water diversions. Equal numbers (13%) had used cover crops and conservation tillage.

- Of the projects, 65% were completed; 19% planned; 10% were terminated; and 6% were on-going projects.

- Respondents were asked to rate the agency assistance; 64% considered the assistance very helpful or somewhat helpful; 25% considered the assistance not too helpful, or not at all helpful.

- Those respondents unhappy with the assistance were asked why they considered the assistance not too helpful or not at all helpful. Equal numbers (24%) replied that there was too much government red tape, or the agency representative came to look but never called back or couldn't help. Equal numbers (13%) had one of four replies. The process is too slow; the cost was more than the owner was told; the representatives didn't have all the forms and information; and nobody at the agency knew what they were doing.

Forest Question Responses

Acreage and Operation

In the first section of the survey the respondents were asked questions about forest acres owned and leased. Residents were polled for the type of forest management, with considerations for diversification.

- The largest forestry operation was 1,340 acres with the average size at 84 acres.
- One-fourth (24%) own from 10 to 24 acres and a second one-fourth (23%) own 25 to 49 acres of forest land.
- The longest period owning or operating forest land was 56 years; the shortest 1 year; and the average 19 years.
- None of the respondents are leasing forest land. Very few (3%) lease out some or all of their forest land.
- Of the respondents, 73% plant trees; 37% salvage log; 29% commercially thin; 26% pre-commercial thin; about equal numbers (23% and 21%) apply herbicides or clearcut harvest; and 17% use prescribed burns.

Stream, Roadway, Soil, Irrigation, and Septic System Management

The respondents were questioned about stream or river banks on their property, and any management measures. They were polled for similar information on road cuts or embankments, soil erosion control, irrigation management, and septic system maintenance.

- A majority (53%) of the forest lands have streams or river through them. Five miles was the longest watercourse; 40 feet the shortest; and .5 mile the average.
- Almost one-fourth (23%) of those with streams or rivers have installed bank protection on their property. Slightly more than one-fourth (27%) of those installations are riprap; 20% have planted grass to protect the banks.
- One-half (51%) have road cuts or embankments on their property. Ten miles was the longest roadway and .9 mile the average. More than three-fourths (84%) were more than two years old. More than one-third (39%) of the roadways have erosion control measures.

- They were asked where to get planning or financing for water quality projects. About the same number (29% and 27%) mentioned the Oregon Department of Forestry or the OSU Extension Service. The USDA Agricultural Stabilization and Conservation Service was mentioned in 15% of the responses.

- One-third (35%) of the respondents said that forest owners could get planning or financing for water quality projects on their property.

- Only 12% have used agency help with planning or financing such projects.

- One-third (30%) of the projects were for tree planting. The rest were equally distributed between the Stewardship Incentive Program, tree thinning, evaluating conservation practices, and others.

- Of the projects, 43% were completed; 29% planned; and the remainder on-going or terminated.

- Respondents were asked to rate the agency assistance and 86% consider the assistance very helpful.

Public Perception

Those surveyed were asked how serious was the surface water quality in their area and why. Respondents were asked for any additional comments about surface water quality.

- More than a majority (60%) believe that the water quality in area streams and rivers is not at all serious, or not too serious. One-third (32%) believe that the surface waters have a somewhat serious or very serious quality problem.

- Those believing that there was a problem, were asked, why? About an equal number (38% and 36%) believed that the land use (agriculture, logging, or manufacturing) or pollution was causing the problem. Population problems (overuse or water supply) was blamed by 25% for the water quality problems.

- When asked for other water quality comments, 26% believed that cleanup is needed to protect aquatic life. A group (12%) thought that population and growth are the problem. Equal numbers (7%, 7%, 7%, and 7%) said that the water quality is improving; government and land owners need to work together; that chemicals and fertilizers are part of the problem; and forest debris and flotsam are a problem.

Conclusions

Results from a sample of 298 land owners, self-described as 178 farm and 120 forest, indicate the following:

Farm acreage ownership tends to be larger than forest acreage; and leasing property, common in farming, is rare for forestry. Farm diversity, grains, forage, seed crops, orchards, small fruits, and vegetables dominated the farm sector. Surprisingly, one-fourth of the farmers also raise Christmas trees or practice forestry. Most of the foresters are planting trees, and salvage logging or timber thinning, is more common than clear cutting. Forest herbicides and prescribed burns are not used very often.

All of the surveyed property has either a stream, cut roadway, or both. At least one-quarter of land owners, depending on the type, have installed some means of stream bank and/or roadway erosion control. Half of the farmers irrigate with sprinklers or a big-gun system. Irrigators check the plant condition or soil moisture to schedule irrigations. Almost all of the respondents have a septic system; and any maintenance, other than pumping, is infrequent.

Many of the farms, and some of the forest operations, raise some livestock. Beef or dairy cattle and horses are the most common, with beef and dairy animals in commercial numbers on some of the farms. Commercial swine and poultry operations were also noted. Most of the livestock owners pasture the animals, and don't collect or store the wastes, with the commercial-sized operations as the exceptions.

Unfortunately, only some of the people, farm or forestry, knew that they own land within the HUA. When asked where to go for water quality project information, the respondents frequently mentioned the OSU Extension Service. At least one-third of the respondents knew the agency help was available for projects.

When asked where to go for water quality project planning or financing help, only the farm respondents frequently mentioned the USDA Agricultural Stabilization and Conservation Service or Soil Conservation Service. One-fourth of the farm respondents, who had sought agency assistance, were not satisfied with the help.

Two-thirds of the respondents were men, with the average age in the fifties, and most of them are married. All respondents had completed high school and many had attended a four-year college or university. One-third or more responses have the respondent and/or spouse working elsewhere. The off-farm or forest-land work accounted for at least three-fourths of their annual income.

Data

Number of acres leased out

1.0 - 4.9 acres	5	7
5.0 - 9.9 acres	9	13
10.0 - 24.9 acres	17	24
25.0 - 49.9 acres	12	17
50.0 - 99.9 acres	13	19
100.0 - 199.9 acres	9	13
200.0 + acres	4	6
Don't know/no answer	1	1
	70	100

5. I have a short list of crops that are grown in Washington County. As I read each one, will you please tell me if you raised it in 1991 or not?

	Yes	Freq.	%	No	Freq.	%
Orchards, small fruits, or veg.	x	19	52	x	85	48
Grain, forage, or seed crops	x	112	63	x	64	37
Bare root/container nursery crops	x	6	4	x	170	96
Forestry or Christmas trees	x	42	24	x	134	76
Other	x	28	16	x	148	84
Don't know/no answer	x	2	1	x	176	99

6. Is any of the <u>crop</u> land you own or operate within the Dairy-McKay Hydrologic Unit Area - that is, the area bordered by East and West Dairy Creeks and McKay Creek?

	Freq.	%
Don't know/no answer	10	6
No	103	58
Yes	65	36
Total	178	100

> 6a. How many cropland acres altogether do you own or operate in the Dairy-McKay Hydrologic Unit Area?

	Freq.	%	Mean	Max	Min	StD
Number of acres crop land	64		201	2,100	2	341
Don't know/no answer	1					

7. Do you own or operate any <u>pasture</u> land within the Dairy-McKay Hydrologic Unit Area?

	Freq.	%
Don't know/no answer	6	3
No	139	78
Yes	33	19
Total	178	100

> 7a. How many acres of pasture land do you own or operate in the Dairy-McKay Hydrologic Unit Area?

	Freq.	%	Mean	Max	Min	StD
Number of acres pasture	33		15	75	2	17

8. Are there any streams or rivers that run all year through the crop or pasture land you own or operate in Washington County?

	Freq.	%
No	105	59
Yes	73	41
Total		100

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> 9a. What is the total length, in feet, of the embankments and cuts?

	Freq.	%	Mean	Max	Min	StD
Feet	37		1,480	13,200	2	2,235
Don't know/no answer	6					

9b. Are any of your roadway embankments or cuts less than two years old?

	Freq.	%
No	39	91
No answer	4	9
	43	100

9c. Are there any improvements that have been installed to reduce erosion on your road embankments, or not?

	Freq.	%
Don't know/no answer	2	5
No	30	70
Yes	11	25
Total	43	100

> 9ca. I also have a few improvements that some people have installed to reduce erosion. As I read each one, will you please tell me if you have put them in, or not? (INT: If R has added improvement, ask for year installed.) First...

		Freq.	%
Grass seeding	Yes	4	36
	No	7	64
	Year 1972	1	
	On-going	2	
	Don't know/none	8	
Catch Basins	Yes	2	18
	No	9	82
	Year 1991	1	
	1975	1	
	Don't know/none	9	
Mulching	Yes	0	0
	No	11	100
Rock lined ditches	Yes	2	18
	No	9	82
	Year 1988	1	
	Don't know/none	10	
Other	Yes	5	46
	No	6	54
	Year 1992	1	
	On-going	1	
	Don't know/none	9	

10. Do you operate an irrigation system on any of the crop land or pasture land you own or manage in Washington County?

	Freq.	%
Don't know/no answer	2	2
No	88	49
Yes	88	49
Total	178	100

> 11a. Have you completed any maintenance to your septic system, other than routine pumping, in the last three years, or not?

	Freq.	%
Yes	19	11
No	148	88
Don't know/no answer	2	1
	169	

12. Do you have a livestock operation on the property you own or manage in Washington County?

	Freq.	%
Don't know/no answer	1	1
No	99	56
Yes	78	43
Total	178	100

> 12a. What type of animals do you have?

	Yes	Freq.	%	No	Freq.	%
Beef	x	39	50	x	39	50
Dairy	x	19	24	x	59	76
Horses	x	25	32	x	53	68
Sheep	x	6	8	x	72	92
Hogs	x	5	6	x	73	94
Chickens/Ducks	x	4	5	x	74	95
Goats	x	5	6	x	73	94
Rabbits	x	1	1	x	77	99

> 12ab. How many animals do you have?

	Freq.	%	Mean	Max	Min	StD
Beef	39		15	100	1	19
Dairy	19		87	250	1	81
Horses	25		3	9	1	2
Sheep	6		13	45	3	16
Hogs	5		80	200	20	70
Chickens/Ducks	4		15	24	2	9
Goats	5		8	30	1	12
Rabbits	1		30	30	30	--

> 12b. How do you store your animal waste - a waste holding pond, a dry storage facility, some other method, or no storage at all?

	Freq.	%
Waste holding pond	2	2
Dry storage	14	18
Both holding pond and dry storage	4	5
Storage pile or pit	9	12
No storage/left on pasture/recycle	48	62
Liquid waste tank	1	1
	78	100

13. How serious is waste quality in the streams and rivers of your immediate area in Washington County - very serious, somewhat serious, not too serious, or not at all serious?

	Freq.	%
Don't know/no answer	17	9
Not at all	44	25
Not too	55	31
Somewhat	41	23
Very	21	12
	178	100

> 15ba. What, specifically is this project?

	Freq.	%
Re-vegetation, cover crop	4	13
Animal waste mgmt. system, fencing	10	33
Min. tillage, tillage prac. change	4	13
Tile installation, catch basin, water diversion	5	16
Conservation practices evaluation	1	3
Irrigation system, pond	2	6
Run-off water filtration	1	3
Don't know/no answer	4	13
	31	100

> 15bb. Is this project completed or still being planned?

	Freq.	%
Completed	20	65
Planned	6	19
Terminated	3	10
On-going	2	6
	31	100

> 15bc. How would you rate the help you received - very helpful, somewhat helpful, not too helpful, or not helpful at all?

	Freq.	%
Don't know/no answer	3	10
Very	12	38
Somewhat	8	26
Not too	5	16
Not at all	3	10
	31	100

> 15bca. Why do you say that the help was not too helpful or not helpful at all?

	Freq.	%
Government red tape	2	24
Process too slow	1	13
They came to look, but never called or couldn't help	2	24
Cost would be more than they said	1	13
They didn't have all the forms and information	1	13
Nobody knew what they were doing	1	13
	8	100

16. I have a list of soil conservation practices that some farmers use. As I read each one, please tell me if you have used them in the past three years, or not?

		Freq.	%
Cover Crops	Yes	82	46
	No	88	49
	Don't know/no answer	8	5
		178	100
Conservation Tillage	Yes	68	38
	No	95	53
	Don't know/no answer	15	8
		178	100

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> 19a. (continued)

Respondent/spouse hours	Freq.	%
0-9	0	0
10-19	4	4
20-29	4	4
30-39	20	18
40-49	66	61
50-59	7	6
60-69	7	6
70-79	0	0
80	1	1
	108	100

> 19b. What specific types of work is this?

	Freq.	%
Respondent		
Retail/wholesale work, clerical, shop sales, stock, waitress, baker, etc.	2	5
Construction, manufacturing/support services, plumbing, carpenter, engineer	10	21
Custom farming/logging/ag related	10	22
Agents (real estate, brokers, bankers)	3	6
Doctor/dentist/vet/pharmacist	1	1
Sales reps, suppliers	3	6
Technical services (bookkeeping, computer work, appraisers, analysts, printing)	5	10
Management/non-technical consulting	3	6
Service (cleaning, baby sitting, care-giver	1	1
Truck driver, hauler/bus driver	4	8
Entertainment/artists/writers/crafts	1	1
Repair, installation work or shop/mechanics	1	1
Teaching	3	6
"Small business"/shop owner	3	6
	50	100
Spouse		
Retail/wholesale work, clerical, shop sales, stock, waitress, baker, etc.	3	26
Custom farming/logging/ag related	1	8
Accountant/CPA	1	8
Technical services (bookkeeping, computer work, appraisers, analysts, printing	1	8
Management/non-technical consulting	1	8
Service (cleaning, baby sitting, care-giver)	3	26
Truck driver, hauler/bus driver	1	8
Teaching	1	8
	12	100

> 19c. About what percent did (your) (spouse) off-farm work contribute to your total household income in 1991?

	Freq.	%
0-9	2	4
10-19	3	6
20-29	1	2
30-39	0	0
40-49	0	0
50-59	1	2
60-69	0	0
70-79	0	0
80-89	4	8
90-100	36	72
No answer	3	6
	50	100

FOREST QUESTIONNAIRE

0. Is this _____ (when talking to R) would you describe yourself as a farm owner or operator or as a forest owner or operator? If both,
   > Which one is more important to you - your farm operation or your forest operation?

	Freq.	%
Farm	178	60
Forest	120	40
	298	100

1. Do you describe yourself as a Washington County forest operator, a forest owner, or both a forest owner and operator?

	Freq.	%
Owner only	43	36
Operator only	3	3
Both	74	61
Total	120	100

2. How many total acres of forest land do you own in Washington County?

Number of acres owned	Freq.	%	Mean	Max	Min	StD
	120		84	1,340	3	186
1.0 - 4.9 acres	15	13				
5.0 - 9.9 acres	21	18				
10.0 - 24.9 acres	28	23				
25.0 - 49.9 acres	29	24				
50.0 - 99.9 acres	19	16				
100.0 - 199.9 acres	3	2				
200.0 + acres	5	4				
	120	100				

3. Are you leasing any forest land in Washington County from someone else?

	Freq.	%
No	120	100
Yes	0	0
Total	120	100

> 3.a How many acres of forest land do you lease from someone else? (INT: RECORD FOR EACH TYPE.)

Number of acres	Freq.	%	Mean	Max	Min	StD
	0		0	0	0	0

4. How many acres of your own forest land in Washington County, if any, do you lease to someone else?

	Freq.	%
No	114	94
Yes	3	3
Don't know/no answer	3	3
Total	120	100

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> 7ba. I have a short list of stream bank improvements that some people have installed. As I read each one, please tell me if you have put them in or not? (INT: If R has added improvements, ask for year installed.) First...

			Freq.	%
Rock riprap	Yes		4	27
	No		11	73
	Year	1988	1	
	On-going		1	
Grass Seeding	Yes		3	20
	No		12	80
	Year	On-going	1	
Fencing	Yes		2	13
	No		13	87
	Year	1976	1	
		1990	1	
Other	Yes		11	73
	No		4	27
	Year	1950	1	
		1967	1	
		1976	1	
		1987	1	
	On-going		4	

8. Are there any roadway embankments or road cuts on the forest property you own or manage in Washington County?

	Freq.	%
No	59	49
Yes	61	51
Total	120	100

> 8a. What is the total length, in feet, of the embankments and cuts?

	Freq.	%	Mean	Max	Min	StD
Feet	53		4,523	52,800	2	8,938
Don't know/no answer	8					
	61					

8b. Are any of your roadway embankments or cuts less than two years old?

	Freq.	%
Yes	6	10
No	51	84
No answer	4	6
	61	100

8c. Are there any improvements that have been installed to reduce erosion on your road embankments, or not?

	Freq.	%
Don't know/no answer	3	5
No	34	56
Yes	24	39
Total	61	100

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> 9b. Is there anything you do to manage your irrigation applications, or not?

	Freq.	%
No	8	66
Yes	4	34
Total	12	100

> 9ba. I have a list of the ways people manage their irrigation applications. As I read each one, please tell me if you use them, or not.

		Freq.	%
Soil moisture measurement	Yes	2	50
	No	2	50
Plant response	Yes	0	0
	No	4	100
Consultant recommendation	Yes	1	25
	No	3	75
Calendar date	Yes	1	25
	No	3	75
Other	Yes	2	50
	No	2	50

10. Do you have a septic system on the property you own or manage?

	Freq.	%
No	15	13
Yes	105	87
	120	100

> 10a. Have you completed any maintenance to your septic system, other than routine pumping, in the last three years, or not?

	Freq.	%
Yes	10	9
No	95	91
	105	100

11. Do you have a livestock operation on the property you own or manage in Washington County?

	Freq.	%
Don't know/no answer	1	1
No	100	83
Yes	19	16
Total	120	100

> 11a. What type of animals do you have?

	Yes	Freq.	%	No	Freq.	%
Beef	x	10	53	x	9	47
Dairy	x	3	16	x	16	84
Horses	x	7	34	x	12	66
Sheep	x	1	5	x	18	95
Hogs	x	1	5	x	18	95
Chickens/Ducks	x	2	10	x	17	90
Goats	x	3	16	x	16	84

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14. From what you know or have heard, can forest operators in Washington County get help in planning and financing water quality improvements on their forest land, or not?

	Freq.	%
Don't know/no answer	62	52
No	15	13
Yes	43	35
	120	100

> 14a. Where can they get help for planning or financing water quality projects on their forest land?

	Freq.	%
Oregon Dept. of Environ. Quality	1	2
OSU Extension Service	18	27
OR Dept. Forestry/US Forestry	14	29
ASCS	11	15
SCS	6	9
Hydrologic Unit Area	1	2
County Water Agencies	2	4
Oregon Dept. of Agriculture	2	4
Fellow foresters/forest organizations	4	8
	59	100

> 14b. Have you, yourself, used any of these sources for help in planning or financing water quality projects, or not?

	Freq.	%
No	36	88
Yes	7	12
	43	100

> 14ba. What, specifically is this project?

	Freq.	%
Stewardship incentive program	1	14
Sewage line beside stream	1	14
Replanting	2	30
Tree thinning	1	14
Conservation practice evaluation	1	14
Don't know/no answer	1	14
	7	100

> 14bb. Is this project completed or still being planned?

	Freq.	%
Completed	3	43
Planned	2	29
Terminated	1	14
On-going	1	14
	7	100

> 14bc. How would you rate the help you received - very helpful, somewhat helpful, not too helpful, or not helpful at all?

	Freq.	%
Don't know/no answer	1	14
Very	6	86
	7	100

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> 17b. What specific types of work is this?

Respondent	Freq.	%
Retail/wholesale work, clerical, shop sales, stock, waitress, baker, etc.	1	4
Construction, manufacturing/support services, plumbing, carpenter, engineer	3	13
Custom farming/logging/ag related	6	25
Management/non-technical consulting	5	21
Truck driver, hauler/bus driver	1	4
Repair, installation work or shop/mechanics	6	25
Medical technical workers (nurser, hospital	1	4
"Small business"/shop owner	1	4
	24	100

> 17c. About what percent did (your) (spouse) off-forest work contribute to your total household income in 1991?

	Freq.	%
0-9	1	5
10-19	0	0
20-29	1	5
30-39	0	0
40-49	0	0
50-59	0	0
60-69	3	13
70-79	2	9
80-89	2	9
90-100	11	50
No answer	2	9
	22	100

18. What was your age on your last birthday?

	Freq.	%	Mean	Max	Min	StD
	117		52	82	25	13
No answer	3					

	Freq.	%
20-29	4	3
30-39	18	15
40-49	29	24
50-59	30	25
60-69	23	19
70-79	11	9
80-82	2	2
No answer	3	3
	120	100

19. What is the highest level of education you have completed?

	Freq.	%
8th grade or less	4	3
Grades 9 to 11	3	3
High School graduate or equivalent	43	35
Technical or vocational school	4	3
Some community college	7	6
Some 4-year college or university	29	24
4-year college/university graduate	16	13
Some graduate school	3	3
Graduate degree	9	8
Other	1	1
No answer	1	1
	120	100

Appendices

Final WASHINGTON CO. SCREENER 13 Apr 92

Hello, I'm _____from Oregon State University. We are conducting a survey about Washington County's water quality and would like to ask you a few questions. You may recall receiving a letter from Neil Rambo of the Extension Service that explained the study. Is this _____? (When talking to R) would you describe yourself as a farm owner or operator or as a forest owner or operator?

NEITHER . . . . . 1 (Terminate)
FARM OWNER/OPERATOR . . . . 2 (Use farm quex)
FOREST OWNER/OPERATOR . . . 3 (Use forest quex)
BOTH 4

→ Which one is most important to you -- your farm operation or your forest operation?

FARM . . . . . 1 (Use farm quex)
FOREST . . . . . 2 (Use forest quex)
DK/NA 3

Thank you. Before we begin, I'd like to say that we are talking to a number of Washington County residents and you were chosen for this interview by random methods. I want to assure you that all the information you give us is strictly confidential. The interview is voluntary and if we come to a question you don't care to answer, just say so and we will go on to the next question. Okay?

INT; RECORD DATE, TIME AND RESULT OF EACH ATTEMPT TO CONTACT IN THE TABLE BELOW. NOTE APPOINTMENTS IN THE "TIME OF RECALL" COLUMN.

Date	Time	Interviewer	Results (See Codes)	Time of recall

Codes for results:

NH = Not Home
WR = Will return
REF = Refused
AM = Answer Mach.
BSY = Line busy
PIC = Part comp.
COMP = Completed

Time interview started: _____ Stopped: _____

Verified by: _____

6. Is any of the crop land you own or operate within the Dairy-McKay Hydrologic Unit Area -- that is, the area borderd by East and West Dairy Creeks and McKay Creek?

DK/NA . . 1
NO . . . 2
YES . . . 3

→ 6a. How many cropland acres altogether do you own or operate in the Dairy-McKay Hydrologic Unit Area?

NO. ACRES . . _____
DK/NA 99999

7. Do you own or operate any pasture land within the Dairy-McKay Hydrologic Unit area?

DK/NA . . 1
NO . . . 2
YES . . . 3

→ 7a. How many acres of pasture land do you own or operate in the Dairy-McKay Hydrologic Unit Area?

NO. ACRES . . _____
DK/NA 99999

8. Are there any streams or rivers that run all year through the crop or pasture land you own or operate in Washington County?

DK/NA . . 1
NO . . . 2
YES . . . 3

→ 8a. How many feet of stream- or river-bank do you have on the property you own or manage?

FEET . _____
DK/NA 99999

9c. Are there any improvements that have been installed to reduce erosion on your road embankments, or not?

DK/NA . . 1
NO . . . 2
YES . . . 3

→ 9ca. I also have a few improvements that some people have installed to reduce erosion. As I read each one, will you please tell me if you have put them in, or not? (INT: If R has added improvement, ask for year installed.) First...

	YES	NO	DK/NA	YEAR
a. Seeding to grass . . .	1	2	3	____
b. Catch basins	1	2	3	____
c. Mulching	1	2	3	____
d. Rock-lined ditches . .	1	2	3	____
e. Other (_____				
_____	1	2	3	____

ASK OF EVERYONE:

10. Do you operate an irrigation system on any of the crop land or pasture land you own or manage in Washington County?

DK/NA . . 1
NO . . . 2
YES . . . 3

→ 10a. I'd like to read a list of irrigation systems. As I read each one, please tell me if you use them, or not?

	YES	NO	DK/NA
a. Sprinklers on a handline . . .	1	2	3
b. Permanent sprinklers	1	2	3
c. Big guns	1	2	3
d. Drip	1	2	3
e. Other _____	1	2	3
_____	1	2	3

12. Do you have a livestock operation on the property you own or manage in Washington County?

DK/NA 1
NO 2
YES 3

→ 12a. What type of animals do you have?

	NUMBERS
a. Beef. . . .	_____
b. Dairy . . .	_____
c. Horses. . .	_____
d. Sheep . . .	_____
e. Other _____	_____
_____	_____
_____	_____

12b. How do you store your animal waste -- a waste holding pond, a dry storage facility, some other method, or no storage at all?

WASTE HOLDING POND . 1
DRY STORAGE. 2
OTHER _____ 3
OTHER _____ 4
NO STORAGE 5

ASK OF EVERYONE:

13. How serious is water quality in the streams and rivers of your immediate area in Washington County -- very serious, somewhat serious, not too serious, or not at all serious?

DK/NA. . . . 1
NOT AT ALL . 2
NOT TOO . . 3
SOMEWHAT . . 4
VERY 5

→ 13a. Why do you say that?

15bb. Is this project completed or still being planned?

COMPLETED . . 1
PLANNED . . . 2
OTHER _____

15bc. How would you rate the help you received -- very helpful, somewhat helpful, not too helpful or not helpful at all?

DK/NA . . 1
VERY . . 2
SOMEWHAT 3
NOT TOO . 4
NOT ALL . 5

→ 15bca. Why do you say that? **(PROBE!)**

ASK OF EVERYONE:

16. I have a list of soil conservation practices that some farmers use. As I read each one, please tell me if you have used them in the past three years, or not?

	PRACTICE	YES	NO	DK/NA
a.	Cover crops	1	2	3
b.	Conservation tillage	1	2	3
c.	Buffer strips	1	2	3
d.	Seeding waterways to grass.	1	2	3
e.	Drain tile installation	1	2	3

Finally, a few questions about yourself...

17. How many years have you owned or operated a farm in Washington County?

YEARS _____
DK/NA 99

21. What is the highest level of education you have completed?

8th GRADE OR LESS	1
GRADES 9-11	2
H. S. GRAD OR EQUIVALENT. .	3
TECHNICAL OR VOC. SCHOOL .	4
SOME COMMUNITY COLLEGE . .	5
SOME 4 YR COLLEGE OR UNIV .	6
UNIVERSITY 4 YR GRAD. . . .	7
SOME GRAD. SCHOOL	8
GRADUATE DEGREE	9
OTHER _____	10
DK/NA	11

22. One final question. Is there anything else you would like to say about the water quality of streams and rivers in Washington County?

BY OBSERVATION:

R's Gender?

Male . . . 1
Female . . 2

Final WASHINGTON COUNTY FOREST LANDOWNER SURVEY 13 Apr 92

1. Do you describe yourself as a Washington County forest operator, a forest owner or as both a forest owner and operator?

OWNER ONLY 1
OPERATOR ONLY . . 2
BOTH 3
NEITHER 4
DK/NA 5

(INT: If R is an owner, operator, or both, continue; otherwise TERMINATE interview.)

2. How many total acres of forest land do you own in Washington County?

NO. ACRES OWN . . . . _____
DK/NA 99999

3. Are you leasing any forest land in Washington County from someone else?

DK/NA (SKIP TO Q 4) . 1
NO (SKIP TO Q 4). . . 2
YES 3

→ 3a. How many acres of forest land do you lease from someone else?

NO. ACRES LEASED . . . _____
DK/NA 99999

4. How many acres of your own forest land in Washington County, if any, do you lease to someone else?

NO. ACRES LEASED . . . _____
DK/NA 99999

7b. Has any special stream bank protection been installed to reduce erosion or improve water quality for stream or river banks on your property?

DK/NA 1
NO 2
YES 3

→ 7ba. I have a short list of stream bank improvements that some people have installed. As I read each one please tell me if you have put them in or not? ((NT: If R has added improvement, ask for year installed.) First...

	YES	NO	DK/NA	YEAR
a. Rock riprap . .	1	2	3	____
b. Grass seeding .	1	2	3	____
c. Fencing	1	2	3	____
d. Other (_____ _____	1	2	3	____

ASK OF EVERYONE:

8. Are there any roadway embankments or road cuts on the forest property you own or manage in Washington County?

DK/NA . . 1
NO . . . 2
YES . . . 3

→ 8a. What is the total length, in feet, of the embankments and cuts?

FEET . _____
DK/NA . 99999

8b. Are any of your roadway embankments or cuts less than two years old?

YES 1
NO 2
DK/NA . . . 3

9b. Is there anything you do to manage your irrigation applications, or not?

DK/NA 1
NO 2
YES 3

→ 9ba. I have a list of the ways people manage their irrigation applications. As I read each one, please tell me if you use them, or not?

		YES	NO	DK/NA
a.	Soil moisture measurement . .	1	2	3
b.	Plant response	1	2	3
c.	Consultant recommendation . .	1	2	3
d.	Calendar date	1	2	3
e.	(Other _____			
	_____	1	2	3

ASK OF EVERYONE:

10. Do you have a septic system on the property you own or manage?

DK/NA 1
NO 2
YES 3

→ 10a. Have you completed any maintenance to your septic system, other than routine pumping, in the last three years, or not?

YES . . 1
NO . . 2
DK/NA . 3

13. Suppose someone asked you where he or she could get good information on what landowners could do to improve the water quality of streams in their area. Where would you advise them to get that information? **(PROBE a) for someone to talk to and b) something to read or view.)**

Where else?

14. From what you know or have heard, can forest operators in Washington County get help in planning and financing water quality improvements on their forest land, or not?

DK/NA 1
NO 2
YES 3

→ 14a. Where can they get help for planning or financing water quality projects on their forestland? **(PROBE for ASCS, SCS, and Extension sources.)**

Where else?

14b. Have you, yourself, used any of these sources for help in planning or financing water quality projects, or not?

DK/NA 1
NO 2
YES 3

→ 14ba. What, specifically is this project?

17. Do you (and/or your spouse) work off the forest acreage for pay?

DK/NA . . . 1
NO 2
YES 3

→ 17a. About how many hours per week do (you)(spouse) work off the forest for pay?

a. "R' HOURS/WK ____
DK/NA 99

b. SPOUSE HOURS/WK ____
DK/NA 99

17b. What specific types of work is this?

a. "R" _____
DK/NA 9

b. SPOUSE _____
DK/NA 9

17c. About what percent did (your)(spouse) off-forest work contribute to your total household income in 1991?

PERCENT ____
DK/NA . 99

ASK OF EVERYONE:

18. What was your age on your last birthday?

YEARS ____
DK/NA 99

19. What is the highest level of education you have completed?

8th GRADE OR LESS 1
GRADES 9-11 2
H. S. GRAD OR EQUIVALENT. . 3

TECHNICAL OR VOC. SCHOOL . 4
SOME COMMUNITY COLLEGE . . 5
SOME 4 YR COLLEGE OR UNIV . 6

UNIVERSITY 4 YR GRAD. . . . 7
SOME GRAD. SCHOOL 8
GRADUATE DEGREE 9
OTHER _____ 10
DK/NA 11