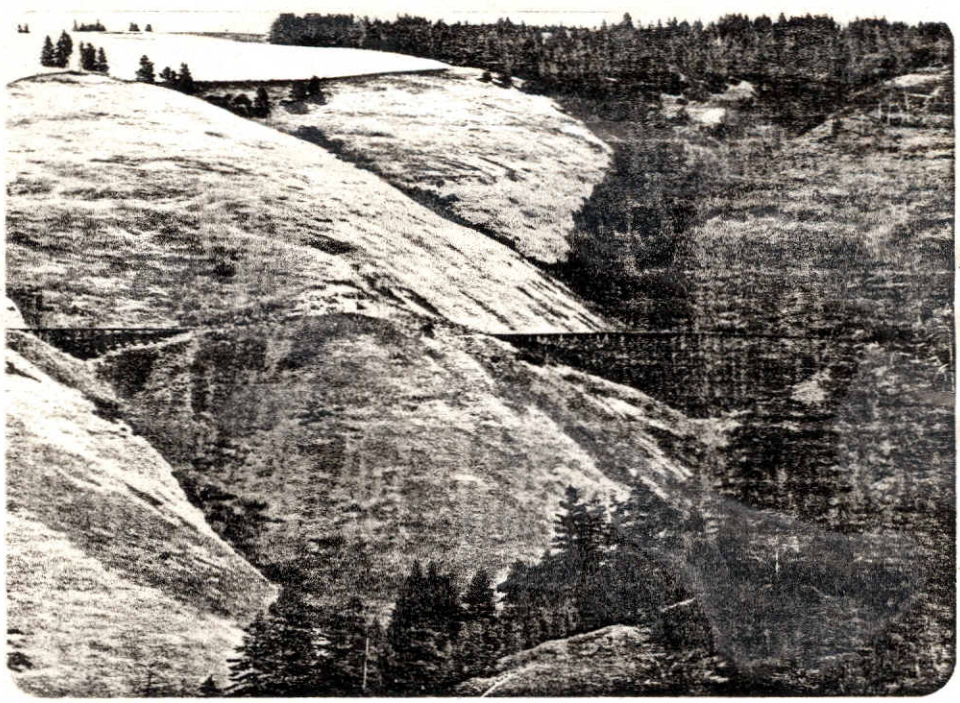
PRELIMINARY INVESTIGATION

LAPWAI CREEK WATERSHED PROJECT



Lewis Soil Conservation District

October 1980

Lewis Soil Conservation District
Box 67 - Craigmont, Idaho 83523

October 29, 1980

Dear Sir;

Enclosed is a copy of our completion report on Lapwai Creek Watershed to the Idaho Soil Conservation Commission.

We appreciate your help and your interest in this phase of the project and we look forward to an action program on Lapwai Creek, in which we welcome your participation.

Sincerely,

Don Hamilton (HM)

Don Hamilton, Chairman
Lewis Soil Conservation District

DATE: 10-31-80
No. of Copies 1
Initial

- ✓ Area Cons.
- Area Clerk
- Agronomist
- ✓ Area Eng.
- ✓ Eng.
- ✓ Const. Insp.
- ~~Soil Sc.~~
- Soil Sc.
- ✓ Range
- ✓ Soil.
- Cartyp.
- Engl. Asst.
- Engl. Aide.
- Secty. to Engr. File

The Lewis Soil Conservation District thanks the following for their assistance in this watershed inventory and preliminary plan:

Idaho Soil Conservation Commission
Soil Conservation Service, principally the Craigmont Field Office
Agricultural Stabilization and Conservation Service
Idaho Department of Lands
Bureau of Indian Affairs
Kenneth Riersgard, Employee, Lewis Soil Conservation Service

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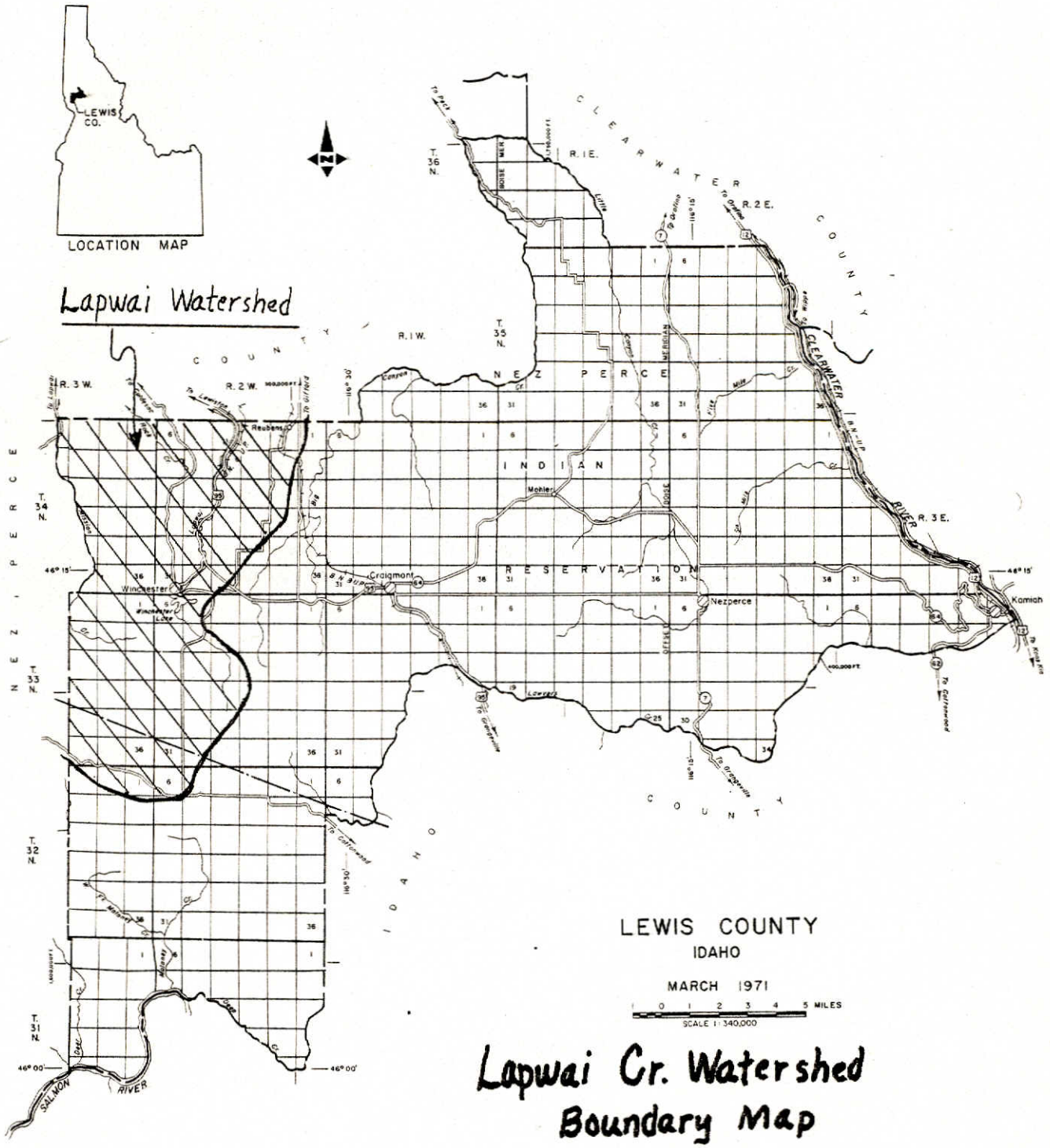
SUPPORTING DATA

The following back-up material is on file in the Craigmont Field Office.

1. General soil survey map of Lewis County
2. Operator map of Lapwai Creek Watershed (8"/mi aerial photo mosaic)
3. Aerial photo mosaic maps on 4"/mi and 8"/mi with Lapwai Creek Watershed boundary.
4. Highway map of Lewis County, ½ in/mi scale, with Lapwai Creek Watershed boundary.
5. Back up notes on non-ag sediment sources
6. Crop system component chart
7. Interview notes
8. Mailing list of approximately 45 operators



Source:
Base map prepared by SCS, WTSC Carto Unit from 1:126,720 General Highway maps.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE USDA-SCS-PORTLAND, OR. 1977

M7-EL-21912-31

LAPWAI CREEK WATERSHED

Preliminary Investigation

Introduction

The Lewis Soil Conservation District submitted a request to the Idaho Soil Conservation Commission for RCA funds to evaluate agricultural practices and identify sediment source factors on the Lapwai Creek watershed. This stream, from Winchester Lake to its mouth was identified as a first priority segment in the Idaho Agricultural Pollution Abatement Plan. The commission approved the request in Devember, 1979.

Some preliminary work was done in early 1979. Further progress was interrupted by the transfer of the District Conservationist out of the state. In August 1980 the district employed Kenneth Riersgard, retired conservationist to complete the project.

It is to be noted that due to the lateness of the season the inventory work had to be done during late summer and fall. Evidence of soil erosion from spring runoff was somewhat obscured but this did not detract from the inventory. A reasonably accurate appraisal of the soil erosion status was obtained by interviews, by field observations, and from previous experience in the community as a district conservationist.

Objective

The project sought to address some general goals as follows:

1. Review and evaluate the farming practices now used in the watershed.
2. Evaluate the soil erosion status associated with these practices.
3. Determine needed practices.
4. Develop an awareness among the land operators in incentive programs to solve the erosion problems.

A specific and primary goal in the inventory is to determine which additional conservation practices would the farmers be apt to use if they were to advance into a better program for sediment control. This matter has direct bearing on improving water quality in this stream segment.

Methods

It appeared that interviews with farmers in the watershed would best

provide a basis for a conservation inventory. Concurrent observation of the crop and tillage systems would supplement interviews. Notes were kept on farmers comments as well as observations made during field inspections of grassed waterways. Of the 40 operators shown on the operator map of the watershed, 35 were interviewed.

Advisory Committee

The goals of the project appear to lean heavily on the existence of a group of local people who would involve themselves with the project and would remain in stand-by for dealing with future programs that might contain opportunities for cost-sharing to accelerate erosion control practices. This committee of three has been formed. They will work with the Lewis SCD to make further gains in water quality and in protecting the soil resources of farms and ranches in the Lapwai watershed.

THE WATERSHED

General

Lapwai Creek orginates in Lewis County and flows north and west 11 miles to the Nez Perce County line, from which it flows about 20 miles west and north to its confluence with the Clearwater River at Spaulding, in Nez Perce County.

Consideration of Lapwai Creek can be done in a number of ways. In this report it includes Rock Creek and Mission Creek which drain the western edge of Lewis County and join Lapwai Creek at Jacques Spur in Nez Perce County. Lapwai Creek itself heads near Mason Butte and flows north through Winchester Lake and within a mile from the spillway it merges with Highway 95 and on into Lapwai canyon, a steep-walled, steep gradient canyon descending from the Camas Prairie. The county line is about 6½ miles north from the top of the canyon. A prominent branch of Lapwai Creek drains the farmland between Winchester and Reubens. It joins the main stream of Lapwai Creek about a mile inside the Lewis County line.

The watershed lies at the western edge of what is called the Camas Prairie. Lapwai Creek Watershed is not a native grassland landscape as is the rest of the Camas Prairie but was cleared from forest.

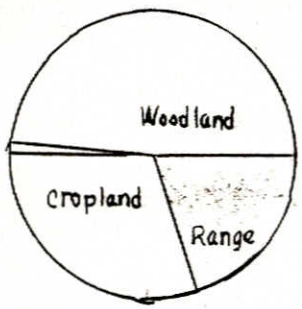
The total acreage of Lapwai Creek Watershed in Lewis County is 50,157 acres which is 34% of the entire watershed in the two counties.

Lapwai watershed is one of the highest elevation farming communities in this part of Idaho.

	Elev.	Annual Precip.	Frost free period	Annual Showfall
Winchester	4000'	24.60"	110 days	100"
Reubens	3500'	---	120 days	100"

According to information from interviews some weather factors are important in the timing and amount of runoff from snow melt and the spring rains. The flood of 1965 which destroyed the highway in Lapwai canyon was a result of chinook conditions over a wider than usual area. There was a simultaneous release of the snow pack from higher and lower elevations and the accompying rain produced immense stream flow on Lapwai Creek. The consensus is that each winter there are two thaw periods in the Winchester area. It is also agreed that the runoff peak is brief, about two days.

PRESENT LAND USE



	Acres	Per cent
Cropland	16,722	33%
Range (native pasture)	9,330	18%
Woodland	23,733	48%
Other	374	1%
Total	50,157	

Cropland: The crops used are winter wheat, barley, peas, and hay. Grass seed has a long history south of Winchester. Winter wheat is the principal crop, although barley makes up the largest acreage of any small grain. Dry and Austrian winter peas are important crops whose acreage varies from time to time. They are more popular in the area between Reubens and Winchester probably due to more favorable growing conditions there. Some spring wheat is grown, mainly in the cooler sections. Hay is grown on possibly 40% of the ranches but it is a minor acreage in the total. Only about four ranches have as much as 100 acres. About 50% of the ranches have livestock. There

are very few acres of seeded pasture. In no case is livestock the principal enterprise.

Average crop yields

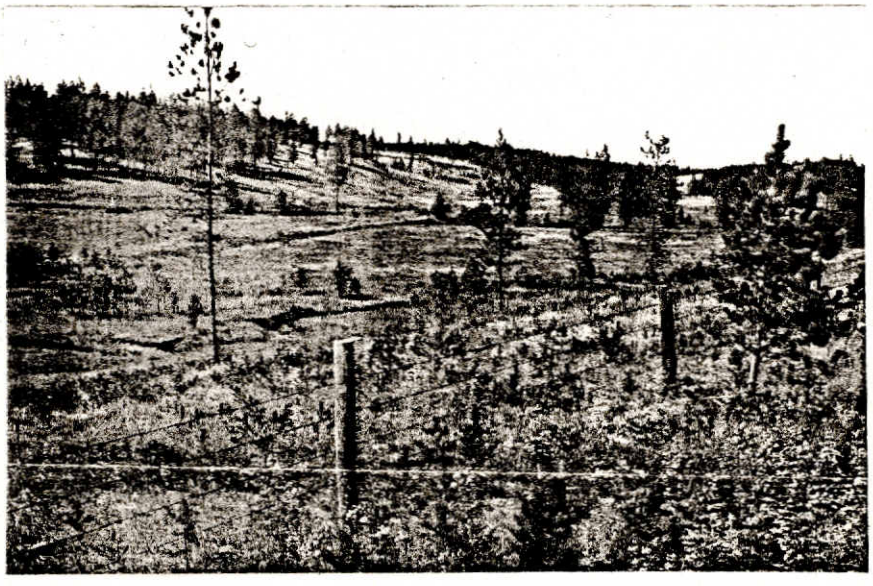
Winter wheat	50 bu/ac
Spring barley	1¼ ton/ac
Spring wheat	40 bu/ac
Peas	1500 lb/ac
Hay	2½ ton/ac

Pasture

Nearly all the land used for pasture within the cropland areas are narrow strips along the streams that meander through the cropland parts of the watershed. These are native grass and often mixed with patches of brush. There is a particularly sensitive feature of these riparian areas in that the stream banks here can be sediment sources if excessive grazing pressure is put on the pasture. There are possibly eight miles of these riparian lands.

Range

In the Lewis County portion of the Lapwai watershed, the rangeland is concentrated on the south slopes along the east side of Mission Creek from Slickpoo to the headwaters. This amounts to approximately 5,000 acres. The other 4330 acres identified in the preliminary data is seeded pasture and native pasture that has been converted from Woodland. Nearly all of the woodland west and south of highway 95 is grazed.



With the possible exception of the lower reaches of Mission Creek the grazing in this watershed is done mostly in the summer from late May into early October. There are some areas which are overgrazed and have converted to bluegrass and redtop, and so could be considered only in fair condition. However, none of the areas grazed lack enough ground cover to be critically eroding.

With the exception of 240 acres BLM and 4770 acres Tribal land the rest is under private ownership.

Wildlife

There is abundant wildlife habitat in the watershed, mostly in the woodland portions. This habitat extends into the cropland where the wooded canyons reach back into the fields of grain and hay. Deer and forest grouse are the main game species.

There is no significant impact from wildlife on sediment yield in the Lapwai Creek watershed.

Woodland

The Craig Mountain Lumber Company mill at Winchester began operation in July 1910. During the next thirty years all the old growth ponderosa pine, Douglas-fir, larch and grand fir was logged in the Lapwai Creek watershed. Logging operations began with horses with logs transported to the mill by rail. Now most logging is done with tracked or wheeled vechicles and trucked to Lewiston or Craigmont.

Present day logging is done on a much smaller scale than in the past. Generally, logging operations today do not exceed forty acres, and are removing much smaller timber. This has probably reduced the amount of erosion and stream sedimentation which was directly caused by logging. But now with the need to build access roads and skid trails into the steep canyon areas, where some of the more valuable timber is growing, sedimentation entering streams has continued and continues to be a problem.

Diverse ownership has somewhat complicated the problem of timber management. About 88 percent of the timbered area in the Lapwai, Mission and Rock Creek watershed is privately owned with a variety of management objectives. About 11 percent is Indian land and one percent is state land.

From the standpoint of reducing erosion and sedimentation, any program

approach must reach the majority of landowners. This majority is in the private sector. The immediate need is for an accelerated cost-share program to assist in the design and layout of woodland roads; and then practices, such as the erosion control practices under the ACP Forest Tree Stand Improvement Practice, should be made available to the private woodland owner. The long-term program should address improved silvicultural systems.

Soils & Landscape

The soil survey of Lewis County is a general survey made in 1972.

All the soils in the watershed were developed under forest cover and are inherently less productive for agriculture than are grassland soils such as occur in the Camas Prairie proper to the east. The soils of the watershed have a tight subsoil of clayey material which restricts the downward movement of water as well as plant roots. This clay layer is shallow enough from previous erosion to be reached by the plow in many places. Rock underlies much of the landscape and some slopes show surface stones to the extent that tillage is difficult. The stones are especially noticeable in spur draws where periodic runoff scours away the soil.

The surface soils are all medium texture. There are differences in the soils in various locations within the watershed. In the Reubens to Winchester sector they have somewhat more organic matter orginally and a

bit darker surface color than those in the other parts of the watershed. The darker soils are the Larkin series; the latter a Taney series.

Temperature is probably the most influencial feature associated with the landscape. The land south of Winchester Lake is in a cooler climate with a shorter growing season than the land between Winchester and Reubens. It effects the choice of crops and planting and harvest dates, all within a distance of a few miles.

There are differences in the landscape that influence runoff and soil erosion. The Reubens-Winchester sector has more cropland that exceeds 10% slope than is the case elsewhere. The area south of Winchester Lake has the least steep land. In general the Lapwai Creek cropland has relatively level topography when compared to the Palouse country to the north.

SOIL EROSION AND EROSION FACTORS

Background

Farming in the high precipitation on region of the Camas Prairie has historically been plagued by soil erosion. Summer cloudbursts and runoff from winter and spring rains have been wearing away topsoil at the vulnerable sites each year; sometimes spectacular, sometimes subtle. Lapwai Creek watershed lies in this setting.

Compared to the Palouse Prairie with its longer and steeper slopes, Lapwai Creek watershed has had less annual soil loss. Other factors like a protective snow cover and the topography contribute to this fact. On the other hand it can spare less soil than the Palouse due to differences

in subsoil texture. In regard to the sediment delivery rate of the feeder streams and Lapwai Creek, there is the element of filtering vegetation. There is an abundance of brushy and grassy arms of native vegetation extending into cultivated fields or adjoining them. They mark the exit of the runoff water from the crop area and serve as settling areas for sediment.

In any reference to Lapwai Creek Watershed proper it must be kept clear that Nez Perce County shares the watershed with Lewis County. The watershed topography in Nez Perce county is steeper than that in Lewis county. However, the fact that Lapwai Creek orginates in Lewis County makes it a logical place to begin the watershed review.

Estimates of Soil Loss

The soil loss map of Lewis Soil Conservation District made in 1977 estimates the annual soil loss as 5-10 tons/ac in the Reubens-Winchester sector and in the area south of Winchester Lake. It is shown as less than 5 tons/ac. elsewhere.

There was no opportunity to measure spring time rill erosion during the present inventory. The revised, 1980, estimate is based on late season evidence of rills and gullies, from interviews, field observation, and previous SCS experience in the community. In summary the evidence leads to the conclusion that soil erosion from the cropland is more than the acceptable rate for this land.

It is presented as follows:

1. All of the Lapwai Creek watershed is in the 5-10 ton/ac soil loss class, with the following qualifications:

    a. Only on heavy runoff years is this true in the area south of Winchester Lake. Often it is less than 5/ton/ac here.

2. The highest soil loss is in the Reubens-Winchester sector, probably near 10 ton/ac.

3. Old Hwy 95 north of Winchester & west of Lapwai canyon is intermediate between the two above.

Five tons/ac soil loss is assumed to be the acceptable level.

Non-Agricultural Sediment Sources

There are non-ag sources of sediment in the watershed that should be recognized. We know of no quantitative measure of these but field observations verify their existence.

1. County road ditches and slopes on the hilly terrian. (bare road ditches)

2. Cultivation encroachment on road backslopes which leaves bare soil areas over winter.

3. Channel scouring in main feeder streams & Lapwai Creek itself.

4. Steep canyon wall slide-outs--localized sloughing and slide-outs of unstable slope material.

Factors in Agricultural cropping systems that aggravate Erosion Problems

1. Use of low residue crops, mainly dry peas, and use of summerfallow on sloping land.

2. Stony, shallow soil areas are a distinct sediment source, as they are prone to erode first.

3. Climate factors are noted in Elevation & precipitation

The set-aside feature of federal farm program continue to be an invitation to use summerfallow. It tends to be one of the reasons for continuing the summerfallow practice.

CONSERVATION INVENTORY

It is appropriate to summerize the practices now being used that relate to the conservation strength of the cropland in the watershed.

Crop Systems, Tillage, and Residue Use

It appears that a common crop combination is wheat, barley, barley, peas. Fallow is substituted for peas when extra weed control is needed. Wheat and barley are the main crops with barley the highest acreage annually. Grass for seed production is grown in the sector south of Winchester. Hay is an occassional crop. Stubble is seldom burned. The weak link is the use of summerfallow, and secondly the frequency of a pea crop within the small grain crop years. More peas are grown in the Reubens-Winchester sector than the other part of the watershed. It is logical to assume that the greater use of peas has a bearing on the greater use of fallow for weed control.

Tillage, other than that of fallow, is generally conventional. A promising trend is the increased use of heavy cultivators and chisel plows, as a primary tillage tool. Widespread use of these will reduce the erosion hazard.

Sod Waterways

There is an abundance of grassed waterways over the watershed. However, they vary much in their effectiveness. Many graded and shaped waterways have been narrowed excessively from plowing into over a period of time. Another need is to seed grass in some of the spur draws feeding into main channels. These are less obvious than larger draws but spur draws are often on steeper slopes and subject to soil cutting each crop year.

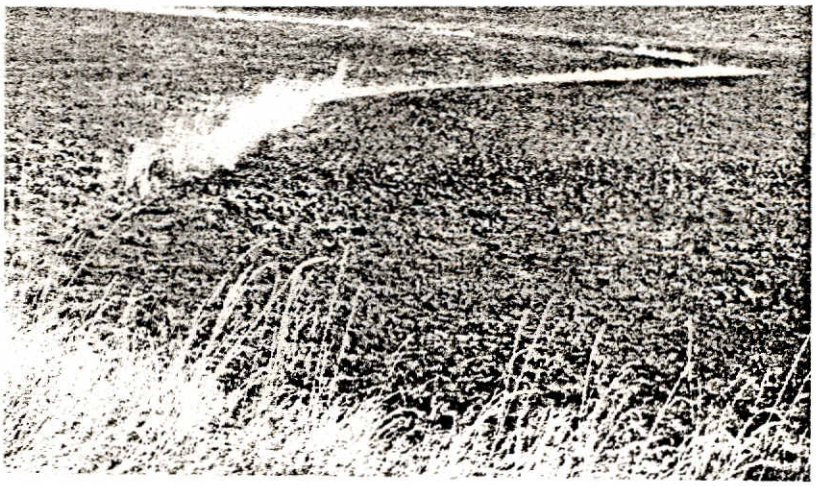
There are generally three types:

1. The best: 30-100 feet wide, good grass cover, crossable, mowed for hay.

2. Narrow V-ditch, grassed with 2-6 foot wide shoulder, unmowed, not readily crossable, often crowded by plowing to a trace of the original waterway.

3. Natural drainageway, never shaped, abundant grass cover, unmowed, variable gradient, channel meandering, seldom crossable.

Type 2 is the most in need of repair. It presents an acute erosion and sedimentation hazard, where ever there is enough slope to the drainageway to set up an erosive water flow. Probably half of the existing waterways are in this group.



(Spur Draw, Scoured to Rock)

Some of those in Type 3 would benefit from shaping and seeding a more definite channel. In some instances mowing the grass and other maintenance would be beneficial.

Grassed waterways that are used for hay are more inclined to be properly maintained. A waterway system within a field encourages the use of contour farming

Weed Control

There are well developed chemical weed control programs for the crops grown here but the local weather conditions sometimes lower the effectiveness of the materials. With a good chemical weed program in effect there is no need for fallow in this high rainfall zone. However, local weather factors at present seem to make some reliance on fallow a necessity. The extent to which this occurs has a direct bearing on the annual erosion hazard in the watershed.

Other Practices

There are no field strips, field diversions or sediment retention dams now in use. Some cross-slope seeding of fall wheat is done but it is minor. Tile drains have been installed at a very low annual rate even though poorly drained sites occur on many slopes as well as bottomlands. Divided slope farming is not practiced. The practice would be feasible on that portion of cropland where fields are large enough to be split into an upper and a lower part for a spring crop-fall crop combination.

Drainage - The watershed is subject to abundant snow melt waters each spring. The topography is such that ponds in low lying sites and delays spring tillage and gully erosion. Tile drains combined with a grass waterway could correct many of these problem areas.

Logical Alternatives for Improvement in Erosion Control and Sediment Abatement in the Lapwai Creek Watershed

(Refer also to Conservation Inventory for details)

1. Improve the agronomic program on the cropland
    1. Less summerfallow
    2. Fewer acres of peas annually
    3. Conservation tillage, especially on fall seeded crops
    4. Adopt use of divided slope farming to support peas or fallow
2. Install more Grassed Waterways
    1. Seed grass in spur draws now farmed. (These sites may need a normal grassed waterway or it may be more practical to plant an entire hillside to grass as a critical area seeding.)
    2. Renovate old waterways to more effective function
    3. Combine tile drainage with waterway establishment for erosion control
3. Install sediment basins at strategic locations

Program Implementation

It should be emphasized that in the implementation of a cost-share program on this watershed there should be emphasis on the agronomic practices concurrent with the structural practices. The agronomic practices contribute to the successful performance of structural practices as well as their length of life.

Economic Feasibility

Local experience with the recommended construction practices has shown that the costs involved are consistent with the anticipated benefits. No attempt is made to give cost estimates because its usefulness would not justify the time expended. Construction costs can be readily determined when a specific action program materializes.

Environmental Impact

Evidence accumulated in this community and adjoining areas with similar type agriculture, points up the fact that the land treatment practices suggested in this report are environmentally sound. Specifically, the reduction of soil erosion simultaneously improves water quality and upgrades other environmental factors.