FLATHEAD VALLEY, MONTANA
FIELD SUMMARY REPORT

I. INTRODUCTION

The purpose of this field trip was to ground truth aerial photography of the study area to facilitate accurate photointerpretation.

A. 1:100,000

Wallace SE	Cutbank SW
Wallace NE	~~Choteau NW~~
Kalispell SE	Choteau SW
Kalispell NE	Butte NE (Marcum Mountain Quad)
Cutbank NW	Butte NW (Browns Lake Quad)

B. 7.5' Quadrangles with Checksites

Evaro	McGee Meadow
Fort Conah	Camas Ridge West
Saddle Mountain	Red Meadow Lake
Huson	Radnor
Quinns Hot Springs	Bull Lake
Polson	Fortine
Lower Crow Reservoir	Lake McDonald West
Proctor	Mount Cannon
Elmo	Saint Mary
Niarada	Starr School
Lone Pine	Browning
Somers	East Glacier Park
Creston	Nyack
Bluegrass Ridge	Salmon Prairie
Marion	Cilly Creek
Condon	Ovando
Cygnet Lake	Ovando Mountain
Seeley Lake East	

C. Field Members

C. Elliott	USFWS/Region 6
K. Drake	USFWS/Region 6
M. Bevilacqua	Geonex Martel Laboratories, Inc.
K. Bon	Geonex Martel Laboratories, Inc.

D. Field Dates

August 8, 1988 - August 17, 1988

E. Aerial Photography

Type: Color Infrared Transparencies
Scale: 1:58,000

DATE	% COVERAGE	DATE	% COVERAGE
07/26/82	5.9%	08/12/84	7.4%
07/27/82	7.8%	08/14/84	8.6%
08/06/82	6.3%	08/21/84	14.8%
08/07/82	5.2%	08/24/84	.8%
08/19/82	7.8%	08/02/86	3.0%
08/24/82	11.3%	08/13/87	.4%
08/05/83	5.9%	08/31/87	.8%
08/09/84	12.5%	10/01/88	1.5%

F. Collateral Data

USGS Topographic Quadrangles: 258 @ 1:24,000
5 @ 1:250,000

Montana Fish and Game Contour Maps: Kicking Horse Reservoir, Horseshoe Lake, Upper Whitefish Lake

Forest Service Map of Flathead National Forest (North Half)

Soil Survey of Glacier County Area and Part of Pondera County, Montana; 1980. United States Department of Agriculture, Soil Conservation Service.

Soil Survey: Upper Flathead Valley Area, Montana; 1960. United States Department of Agriculture, Soil Conservation Service.

Southard, A.R., 1973. Soils of Montana. Montana Agricultural Experiment Station, Montana State University, Bulletin 621.

Water Resources Data Montana, Water Year 1987, Volume 2 Columbia River Basin. United States Geological Survey, Water Data Report MT-87-2.

Hydric Soils of the State of Montana, 1985. United States Department of Agriculture, Soil Conservation Service.

Bailey, R.G., 1980. Description of the Ecoregions of the United States. U.S. Department of Agriculture Forest Service, Miscellaneous Publication No. 1391.

Cowardin, L.M.; V. Carter, F.C. Golet and E.T. LaRoe, 1979. Classification of Wetlands and Deepwater Habitats of the United States; United States Department of the Interior, Fish and Wildlife Service.

II. OVERVIEW

A. Physical Geography

The study area is located in northwestern Montana and is bounded on the west by the 115' meridian and on the east by the 113' meridian. On the south it is bounded by the 47' parallel and on the north by the 49' parallel (the United States-Canada border).

According to Bailey, Description of the Ecoregions of the United States (1980), the majority of the study area (approximately 80%) lies in the Cedar-Hemlock-Douglas fir Forest Section of the Columbia Forest Province.

The remainder of the study area (approximately 20%) lies in the Douglas fir Forest Section of the Rocky Mountain Forest Province. This comprises the south-central region of the study area only. Although this area lies in a different section and province, it is surrounded on three sides by the preceding section and province, and has similar land-surface forms, climate, vegetation, and soils; although all of these can differ considerably with topography.

The area consists of high, rugged mountains rising to more than 9,000 feet (2,700 m.) with local relief in excess of 3,000 feet (900 m.). In the Rocky Mountain trenches there are several flat or nearly flat valleys, some of which are several miles wide, along which major rivers such as the Flathead, Clark Fork, Swan, Clearwater, and Jocko Rivers flow. The two dominant features on the landscape are Flathead Lake (the largest naturally-occurring, freshwater lake in the United States west of the Mississippi River, formed by Flathead Glacier) and the awe-inspiring Glacier National Park range with its rugged peaks, glacial lakes, and alpine glaciers.

B. Climate

The Continental Divide forms a natural boundary between the principal climatic areas of the state. According to Southard, Soils of Montana (1973), the study area in western Montana can be classified as having a maritime-modified continental climate with more uniform temperatures and increased precipitation than the eastern and central portion of the state.

Winters are usually severe, with an average temperature for the coldest month lower than 32' F (0' C), and an average temperature lower than 72' F (22' C) for the warmest month (Bailey, 1980). Summer days are often hot with temperatures up to 90' F at low elevations for short periods. Nights are cool with temperatures in the 40' F range at times.

Precipitation generally averages between 20 and 40 inches (500 - 1,000 mm.) per year mainly in the winter, with dry summers (Bailey, 1980). The amount varies considerably, however, depending on elevation. In the highest mountains (such as in Glacier National Park) precipitation may reach as high as 56 inches (14,000 mm.) (Southard, 1973) a considerable portion being snow. At the lower elevations precipitation can be as low as 10 inches (250 mm.) annually.

C. Vegetation

According to Bailey 1980, mixed coniferous-deciduous forest predominates with cedar-hemlock-Douglas fir forest comprising the majority of the study area, and Douglas fir forest making up the remaining portion. Well marked vegetational zones are controlled by a combination of altitude, latitude, direction of prevailing winds, and slope exposure. The uppermost belt is the alpine, where trees are absent. Next is the subalpine belt dominated by Englemann spruce and subalpine fir. Below this is the montane belt, characterized by western redcedar, western hemlock, and Douglas fir. Below the montane is a belt of grasses and shrubs, usually in the valleys.

D. Soils

Soils in the Columbia Forest Province (approximately 80% of the study area is the Cedar-Hemlock-Douglas fir section) are mostly cool, moist Inceptisols formed by recent glaciation on steep slopes. In the Rocky Mountain Forest Province (approximately 20% of the study area is the Douglas fir Forest section), Mollisols and Alfisols dominate the montane (Bailey, 1980).

III. BIOLOGICAL CHARACTERISTICS OF WETLAND HABITATS

A. Marine: Not present

B. Estuarine: Not present

C. Riverine

The riverine systems within the study area (rivers, streams, creeks, ditches) have substrates composed of unvegetated mud, sand, gravel, or cobble and will be classified as unconsolidated bottom (UB) or streambed (SB). All unvegetated alluvium such as sand or gravel bars along rivers and streams will be classified as unconsolidated shore (US). Any emergent or aquatic vegetation associated with these systems (floodplain, vegetated ditches) will be classified under the paulstrine system. This is consistent with the conventions for the rest of Region 6.

D. Lacustrine

All lakes lacking a wave-formed shoreline or contour information showing a depth greater than 6 feet will be classified as aquatic bed (AB). The species observed in the field were duckweed (*Lemna minor*) and water lilly or spatterdock (*Nuphar* sp. or *Nymphea* sp.). The remaining lakes will be classified as unconsolidated bottom (UB). All unvegetated shore areas will be classified as unconsolidated shore (US). All emergent vegetation associated with the lakes will be classified under the palustrine system. This is consistent with the conventions for the rest of Region 6.

E. Palustrine

The greatest number of wetlands will be palustrine, and the vast majority of these will support emergent and/or aquatic vegetation. The exception will be gravel pits which will be classified unconsolidated bottom (UB), following Region 6 conventions.

Open water bodies less than 20 acres in size were found to support aquatic vegetation at some time during the growing season and will be classified as palustrine, aquatic bed (AB). The vegetation observed included duckweed (Lemna minor), and water lilly or spatterdock (Nuphar sp. or Nymphea sp.). Beaver ponds as well as impoundments and sewage ponds within the study area were also seen to support aquatic vegetation and will be classified as such. The extent of beaver influence on vegetation surrounding the dam could not be determined, and the beaver (b) modifier will only be used on the open water body behind the dam.

Semipermanently flooded (F) emergent, wetlands are generally dominated by cattail (Typha sp.) and/or hardstem bulrush (Scirpus acutus). Cattail can also be present in seasonally flooded wetlands.

Seasonally flooded (C), emergent wetlands can contain a wide variety of vegetation. American sloughgrass (Beckmania syzigachne) and various sedges (Carex sp.) were dominant in most seasonal wetlands. Other species observed were horsetail (Equisetum fluviatile), reed canary grass (Phalaris arundinacea), spike rush (Eleocharis sp.), dwarf spike rush (Eleocharis sp.), tufted hairgrass (Deschampsia cespitosa), smartweed (Polygonum sp.), water plantain (Alisma sp.), whitetop (Scholocloa festucacea), water parsnip (Sium sp.), Baltic rush (Juncus balticus), and arrowhead (Sagittaria sp.).

Temporarily flooded (A), emergent wetlands can also contain a wide variety of vegetation. Reed canary grass (Phalaris arundinacea) was the dominant species in most temporaries. Other species observed were Timothy (Phleum sp.), horsetail (Equisetum fluviatile), foxtail barley (Hordeum jubatum) a drawdown or disturbance species, Rumex sp., prairie cordgrass (Spartina pectinata), western wheatgrass (Agropyron smithii), sow thistle, and iris. Few stand alone temporaries were observed in the field. Most existed as zones associated with other wetter wetlands, or as linear features.

Saturated (B) wetlands will be restricted to seeps and springs on slopes or meadows which were field checked, the most frequently observed emergent being sedge (Carex aquatilus). Horsetail was also observed frequently in saturated wetlands, along with other species that occur elsewhere.

Willow (Salix sp.), cottonwood (Populus deltoides), and alder (Alnus sp.) were the only wetland species of either scrub-shrub (SS) or trees (FO) identified in the field. Almost all of these were temporarily flooded (although a few willow were seasonal or saturated) and associated with floodplains or in draws.

As can be seen by the preceding paragraphs, many of these wetland species can be found in more than one water regime, and a couple can be present in three (horsetail can be temporary, seasonal, or saturated).

IV. IMAGERY, DELINEATIONS, FIELD CHECKING

A. Considerations of Imagery

1. Quality

a. Emulsion

1) Tones
Some of the photography seems to be excessively red, although this could be attributed to the date of photography (July-August) and not a problem with the emulsion. This should not affect the interpretation.

2) Bleaching
There is no evidence of bleaching on the photography that we have looked at.

3) Spectral Reflectance
There has been little, if any, spectral reflectance on the photography that has been looked at and this should not cause a problem with the photointerpretation.

b. Resolution

The resolution, or clarity, of all the dates of photography that we have looked at has been excellent.

2. Season of Photography
All of the photography (except a few fill-in photos) is July or August, although the years vary (1982,1983,1984,1986,1987). The season of the photography should be good because of the lack of snow at this time of year and the growth of emergents and aquatic bed for proper classing.

3. Climatic Conditions at Time of Photography

a. Snow
There is no snow on the photography except at the highest elevations. This will not be a problem with interpretation.

b. Inundation, Drought
There has been no flooding on the photography that we have looked at and this will not be a problem.

B. <u>Expectations vs. Ground Verification</u>

1. Upland-Wetland Problems

a. There are many streams and creeks delineated on the topographic quadrangles as either perennial or intermittent that can't be seen on the photography due to tree cover. Are they wet or dry?

b. There are many areas in the valleys and coming down out of the hills (natural drainages and fields along irrigation canals) that exhibit an odd, possibly wet signature on the photography. Should they be delineated as wetland, and if so how should they be classified?

c. There are also several meadows and fields which have wet photosignatures but have been hayed to a large degree and the upland/wetland boundary has been obscured. Where do we place the break?

2. Wetland Signatures-Cover Typing

Due to either dryness of photography or slight washing out of the emulsion on some photos it was difficult to differentiate water regime (A/C, C/F) of some emergent wetlands.

V. SOLUTIONS TO PROBLEMS FOUND IN IV B

1. Upland-Wetland

a. It was decided from field checking that we would use the following conventions on perennials and intermittents:

1) Intermittent streams and creeks will not be pulled out unless they are obviously wet on the photography, and then generally as temporary.

2) Perennial streams and creeks that have a visible connection to a R2 or R3 and are camouflaged by trees will be classified as R4SBF.

3) Perennial streams and creeks camouflaged by trees and having no visible connection to a R2 or R3 will be typed as R4SBC.

b. It was determined from field checking that these areas (both natural and irrigated) were wet and for the most part seasonally flooded. Since the photo-signatures can be very subtle, with some wetland signatures mimicking upland signatures, we will be fairly liberal in pulling these areas out and typing them as seasonal. However, these signatures will not be pulled unless they are associated with natural drainages or irrigation ditches to avoid typing upland as wetland.

c. Field checking showed that these meadows were seasonally flooded and vegetated with mostly sedges (Carex sp.). Sedges make good hay, hence the widespread practice of haying these meadows. This agricultural practice can obscure the upland-wetland boundary quite effectively. Since a distinct boundary is not evident in all areas the topo will be used extensively as collateral data (marsh symbols, contours, etc.), and the wetland-upland boundary will be carried across hayed fields from non-hayed fields.

2. Signatures-Cover Typing

Field checking helped to differentiate between water regime photosignatures. The field work showed that a lot of what showed up as temporary on the photography was actually seasonal (there are actually very few stand alone temporaries) and some of what showed up as seasonal was actually semipermanent. Some of this discrepancy was cleared up by overlapping an adjacent strip with a different date with the drier photography. The rest of the discrepancy will be taken care of by being liberal with water regimes and typing most non-semipermanent basins as seasonal. This may cause a small increase in the number of seasonals and a small decrease in the number of temporaries, but is preferable to mistyping many seasonals as temporary.

VI. SUMMARY

Even though there are some problem areas in this project (irrigated fields, hayed meadows, etc.) they are relatively minor and with the photography, good field work, and good collateral data the photointerpretation should be very accurate and quite complete.