FIELD SUMMARY REPORT
S.W. KANSAS #6310

I. INTRODUCTION:

The purposes of this field trip were to ground truth aerial photography of the study area, to obtain general information on hydrologic and ecologic systems.

A. Map Names (1:100,000):
Great Bend SW
Pratt NW, SW
Dodge City NW, SW, NE, SE
Scott City SE, SW

B. Quads with check sites:

Great Bend SW:
- Jetmore
- Alexander
- Zook

Pratt NW:
- Wright
- Garfield
- Centerview
- Ford

Dodge City SE:
- Minneola
- Meade NW
- Irish Flats
- Liberal NE:

Dodge City NW:
- Lakin SE
- Lakin NW
- Syracuse East

Pratt SW:
- Coldwater
- Nescatunga Creek North
- Protection
- Protection SW
- Simmons Creek

Dodge City NE:
- South Dodge

Dodge City SW:
- Woods SW
- Hickok
- Elkhart NE

Scott City SW:
- Tribune 3 SE
- Tribune 4 NE

Scott City SE:
- Tennis

C. Personnel:

Chuck Elliott, Kelly Drake - USFWS, Region 6.
Charles Storrs - USFWS, National PIQC.
Lynn Ashby, Cindy Bohn, Dennis Fowler - Martel Laboratories, Inc.
Phil Keasling - BLM, Oklahoma City.
Ralph Brookes - Kansas State Biological Survey, University of Kansas.

D. Date of Trip:

June 1-14, 1986

E. Available Photography:

All aerial photography is color infared at 1:58,000 scale. The photography was taken by NHAP on the following dates:
June 12, 16, 19, 22, 27, 28, 1985
July 3, 5, 6, 1985
September 5, 7, 23, 26, 1985

II. GEOGRAPHY:

The area covered by this study is between 99° and 102°W longitude and 37° and 38°30'N latitude, roughly southwestern Kansas. Bailey's Ecoregion Classification (1980) identifies this area as 2533 in the eastern half (Humid Temperature Domain, Prarie Division, Tall-Grass Prarie Province, Bluestem-Gramma Prarie Section) and 3113 in the western half (Dry Domain, Steppe Division, Great Plains Shortgrass Prairie Province, Gramma-Buffalograss Section). (See Diagram)

The eastern tall-grass prairie is characterized by flat and rolling plains with relief of less than 300 ft. The average annual rainfall of 20-24 inches, occurring predomantly from April to September. Evaporation and precipitation almost balance on a yearly basis and is therefore considered a subhumid climate. However, this area approaches a situation where evaporation rates exceeds precipitation. Annual temperatures can range from highs over 110°F to lows of -20°F. The dominant natural vegetation includes many species of tall and mid grasses such as western wheatgrass, blue gramma, buffalograss, western ragweed, foxtail barley, switchgrass and sandgrass. Prickly pear and sand sage are also common in drier areas. Woody vegetation is rare except on the cottonwood floodplains. Very little of the natural vegetation remains as over 90% of the area is farmed, primarily for winter wheat, soybeans, and corn.

The western half of the study area, the short-grass prairie, is characterized by rolling plains and tablelands. The plains are flat with occasional valleys formed by discecting streams. Here the evaporation exceeds precipitation and the area is considered to be a dry climate. Average annual rainfall is between 16-20 inches decreasing westward. Over 75% falls from April to September. Rainfall is decribed as scant and haphazzard with heavy isolated thunderstorms. (Morton County Soil Survey). The best chance of receiving rainfall is in the first two weeks of June followed by the first week of August (Gray County Soil Survey). The vegetation of the area was naturally short grasses, typically buffalograss and many species of brome. Currently however, the majority of the land is planted in winter wheat. Woody vegetation is restricted to the floodplains.

F. Collateral Data:

Bailey, Robert G. 1980. "Description of the Ecoregions of the United States." USDA Miscellaneous Publication 7391.

Brooks, Ralph E. 1986. "Vascular Plants of Kansas: a Checklist." Kansas Biological Survey, University of Kansas.

Cowardin, et al. 1979. "Classification of Wetlands and Deep-Water Habitats of the United States." FWS/OBS-79/31.

Nelson, R.W, W.J. Logan, and E.C. Weller. 1983. "Playa Wetlands and Wildlife on the Southern Great Plains: A Guide to Habitat Management." FWS/OBS-83/29.

NOAA. Percipitation Data. Dodge City, Kansas. Jan 1985-June, 1986.

Personal Conversation with Joseph Kramer. June 2, 1986. Kansas Fish and Game Commission, Dodge City, Kansas

Reed, Porter B. Jr. 1986 "1986 Wetland Plant List - Kansas." WELUT-86/W12.16.

Rosenshein, J.S. and A. Clebsch, Jr. 1982. "Water Resources Data for Kansas, Water Year 1981." USGS/WRD/HD-82/052.

USDA. 1985. "Hydric Soils of the State of Kansas, 1985." SCS in cooperation with the National Technical Committee for Hydric Soils.

USDA. County soil surveys:

Barber County	Hamilton County	Pawnee County
Barton County	Haskell County	Pratt County
Clark County	Hodgeman County	Rush County
Edwards County	Finney County	Scott County
Finney County	Ford County	Seward County
Ford County	Lane County	Statford County
Grant County	Meade County	Stanton County
Gray County	Morton County	Stevens County
Greeley County	Ness County	Wichita County

USGS. Topographic Maps - 1:250,000 and 1:24,000 for entire area.

Wolfe, Eric Willis. 1986. "Meade Lake Rises Again." KS Magazine, Vol 2, No. 7, pp 22-26.

III BIOLOGICAL CHARACTERISTICS OF WETLAND HABITATS:

MARINE: Not present
ESTUARINE: Not present

RIVERINE:

Southwestern Kansas is characterized by well developed drainage systems, notably that of the Arkansas and Cimarron Rivers. Historically, these rivers provided permanent year round flow recharged by rainfall and snow-melt from the Rocky Mountains. But, in recent years, expanded use of pivot irrigation has caused the Ogallala aquafer to be depleted 10 to 14 times faster than it can be recharged (Wolfe, 1986). Upstream impoundments and water diversions in Colorado withdraw flow naturally sent down stream.

Consequently, the reduction in surface flow and drastic drop in the ground water table have reduced both rivers to intermittent streams. As they enter Kansas along the Colorado border they are virtually dry riverbeds and are charged for brief periods early in the spring or after heavy rains (R4SBA). As the rivers continue their course eastward and are fed by tributaries, the flow increases and can last into or through the summer months (R4SBF-R4SBC). Only a 20 mile section of the Cimarron from Liberal to the Oklahoma border retains its permanent flow (R2UBH).

Localized conditions such as irrigation usage, rainfall amounts, impoundments, and beaver activity have a direct and

very pronounced impact on the amount of water present in the rivers. For instance, because of high water usage and diversion, the Arkansas River in Dodge City is usually a dry excavated ditch (R4SBAx). A few miles downstream, however, the flow has increased and is pooled into semipermanent ponds and emergent marshes by beaver activity. Therefore, the classification of the riverine wetlands can be very segmented on not only the Arkansas and Cimmaron Rivers, but all streams throught the region.

For similar reasons, the other smaller rivers, streams, and creeks of this area have also been characterized by marked reduction in stream flow. Except for rare instances where a stream is still fed by an active spring or purposely fed, all have been reduced to intermittent status or lost entirely (R4SBF, R4SBC, R4SBA). The life of the flow is again dependent on local activity, water usage, and manipulations. Commonly, smaller streams will be impounded or diverted into irrigation ditches (R4SBCx-R4SBAx) to be used for crop or livestock watering. When possible, the streambed will be filled and plowed to increase agricultural efficency and productivity.(U) As a result, drainage ways are interrupted and segmented.

In conclusion, the overall effect of the present agricultural practices in this part of Kansas has been a dramatic reduction in the groundwater and surface recharge of the riverine systems. Few permanent perennial rivers still exsist or are confined to small segments. Small intermittent creeks have been disrupted or lost entirely to crop land. Additionally, the reduced flow has allowed for the establishment of plant communities, both woody and herbaceous, completely changing the characteristic of the riverine environment.

PALUSTRINE:

Riparian communities have become established because of the reduced stream flows, where historically they did not exsist. Large forested and shrub stands of eastern cottonwood (*Populus deltoides*), willows (*Salix* spp.) and salt cedar (*Tamarix gallica*) are common along the present floodplains and upper terraces of the Arkansas and Cimmaron rivers. Other riparian forest species such as locust (*Gleditsia* sp), hackberry (*Celtis occidentalis*), mulberry (*Morus rubra*), American elm (*Ulmus americana*), and green ash (*Fraxinus pennsylvanica*) are also associated with the upper terraces. (U) Ironically, the very factor that allowed for their establishment is now contributing to their decline. Dead or dying cottonwood is common sight on the upper terraces as the water table continues to drop below its roots.

As a result, only those woody plants directly in the river beds or on the immediate adjacent flats or terraces are flooded on a yearly basis and considered wetland by the NWI classification (PSSA, PFOA). These wetlands are predominantly shrub communities of the dominant cottonwood, willow, and salt cedar, joined by the less common species of Russian olive (Elaeagnus angustifolia), indigo bush (Amorpha fruticosa), seep willow (Baccharis sp), and rough leaf dogwood (Cornus drummondii), as conditions permit (PSSA, PSSC).

Emergent species have also established themselves in and along these two major rivers. Cattail (Typha latifolia), hardstem bullrush (Scirpus acutus), and arrowhead (Sagitarria sp) along with the aquatic bed species of duckweed (Lemna minor) and watermeal (Wolfia sp) are especially common in the more permanent sections of the rivers (PEM/ABF) or in the areas of beaver activity (PABGb, PEM/ABFb). Upstream or in the drier sections of the rivers, the hardstem bullrush community is joined by other species of three square (Scirpus sp), water parsnip (Sium sp), horsetail (Equisetum sp), spikerushes (Eleocharis spp), and sedges (Carex spp, Cyperus sp) (PEMC). Foxtail barley (Hordium jubatum), goldenrod (Solidago sp), dock (Rumex sp), lambsquarter (Chenopodium album), and smartweed (Polygonum sp) are the dominant species found on the river flats and as the understory in the willow-saltcedar-cottonwood wetland associations (PUSA, PSS/EMA).

The other rivers and streams of the study area are also vegetated by similar wetland riparian communities both woody and herbaceous. However, these smaller, less violent, streams naturally allowed for some succession of forested species along their channels. But again, due to the drop in the water table, only those directly in the streambed are flooded on a yearly basis are classified as wetland (PFOA, PSSA). Likewise, the type of emergent and aquatic bed communities are also associated with the reduced flow stream depending upon the availability of water and the general size of the tributary. (PEM/ABF-PEMC-PEMA) The small creeks and un-named water courses are often reduced to pockets or disconnected linear segments of emergents because of the agricultural practices. These emergent species are primarily foxtail barley, smartweed, and western wheatgrass (Agropyron smithii) that can adapt to the drier and more disturbed conditions. (PEMA - U)

Playa wetlands comprise another major source of wildlife habitat in Southwestern Kansas. Unfortunately, state officials estimate that over 90% of the basins present at the turn of the century have been actively altered or completely drained. In addition, the severe depletion of groundwater sources has cut off the natural recharge. Less that 30% of the original basins are still hydrologically active.

As a result, the natural diversity and variability of the habitat has been lost. The vast majority of the basins observed during field reconnossance had surface water lasting only brief periods, generally after heavy rains or early in the spring, only enough to delay tillage a few weeks (PEMA). Common species for these wetland basins include foxtail barley, little barley (Hordium pusillium), frogbite (Phyla cuneifolia), burr ragweed (Ambrosia grayii), smartweed, and spikerushes. Saltgrass (Distichlis spicata) was the predominant indicator for saline evnironments as found in some of the western basins.

Although scarce and generally confined to the more temperate eastern region of our mapping area, seasonally flooded basins support a more diverse community of emergents. In addition to the temporary species found along the periphery, these basins will also support a central zone of smartweed, spikerush, three square, sedges, dock, and often times cattail or hardstems bullrush. Only one sempermanent basin is known to exist in the entire 17,000 square mile study area. This basin, located near Meade, is in an area of artesian activity. It supports aquatic species such as pondweeds (Potomogeton spp) (PEM/ABF) and a small shrub community along the basin edge (PSSA) in addition to the more common emergents.

Thousands of small (less than 20 acres) palustrine wetlands have been created through impoundments and excavations. The degree of flooding of these wetlands is a function of size and depth and the amount of surface drainage. Because of the nature of the water levels, drawdown and pioneering plants are the most effective invaders of the exposed flats of these small impoundments. Fireweed (Kochia sp), cocklebur (Xanthium strumarium), white clover (Melilotus albus), and common sunflower (Helianthus sp) are the most prevalent species. Therefore, these waterbodies will be classified entirely as unconsolidated shore when seasonally or temporarily flooded (PUSCh, PUSAh). Semipermanently flooded impoundments, on the other hand, are considered to be stable enough to support aquatic bed species by the end of the growing season. Although not documentable during ground truthing, species such as pondweeds, duckweed, and algae are expected in this situation (PABFh).

Palustrine wetlands associated with the shores and flats of larger impounded reserviors (greater than 20 acres) were found to be associated with more persistant hydrophytic wetland vegetation. The more stable water supply lends itself to the establishment of species such as smartweed, dock, cattail, hardstem bullrush, three-square, and small cottonwood and willow saplings. The flat or shoreline will be classified according to vegetated signature and water levels on the photography (PEMFh, PEMCh, PEMAh, PSSCh, PSSAh, PFOAh). Aquatic bed communities, similar to those in the smaller impoundments are expected and will also be added on the basis of signature and supportive data (PEM/ABFh, L2ABFh).

Pits and dugouts are considered to be unvegetated regardless of their size and permanence. The steep sides, rocky walls, and sterile bottoms offer little support to wetland plant growth. In addition, they are often poor in organic nutrients needed to support aquatic plant and animal life.

LACUSTRINE:

Lacustrine water bodies (greater than 20 acres) have been formed by adding impoundment structures to the larger streams and creeks, or through larger excavation operations along the rivers. The impounded lakes, generally known as "state lakes", are important wildlife and recreation areas. Unless other information is available or evidence conflicts, all these lakes and are considered to be permanent deep-water habitats (L1UBHh L1UBHx). No attempt will be made at the initial photo-interpretation stage to identify littoral zones unless clearly evident on the photography. For example, a large shallow shelf on a sand and gravel pit (L2USCx) or an aquatic bed community in a reservior (L2ABFh) will be classified as littoral.

One natural lacustrine environment was observed in the field. A large shallow basin known as Lake Corrigan covers several hundred acres north of Garden City in Finney County. Due to its salilne nature and the manipulation of water levels for irrigation, the large flat becomes exposed late in the summer and is void of hydrophytic vegetation (L2USC). Large expanses of saltgrass, foxtail barley, and other salt tolerent species grow along its edges (PEMA). Across the road to the east where water levels are more stable and less salty, hardstem bullrush has taken hold (PEMF, PEM/ABF). No other lacustrine flats of this nature were observed.

PLANT LIST

(species listed as most commonly observed)

WOODY

PSSC

indigo bush (Amorpha fruticosa) (OBL)
rough leaf dogwood (Corus drummondii) (FAC)
seep willow (Baccharis salicina) (FAC)

PSSA

willow (Salix spp) (FAC-OBL)
salt cedar (Tamarix gallica) (FACW)
russian olive (Elaeagnus angustifolia) (FAC)

PFOA

eastern cottonwood (Populus deltoides) (FAC-DRA)

U

green ash (Fraxinus pennsylvanica) (FACW)
American elm (Ulmus americana) (FAC)
locust (Gleditsia sp)(FAC)
catalpa (Catalpa speciosa) (FACU)
hackberry (Celtis occidentalis) (FACU)
mulberry (Morus rubra) (FACU)
white walnut (Juglans cinerea)

HERBACEOUS

PABF

duckweed (Lemna minor) (OBL)
watermeal (Wolfia sp) (OBL)
algae (Endomorpha sp) (OBL)

PEMF

cattail (Typha latifolia) (OBL)
arrowhead (Sagittaria sp) (OBL)
hardstem bullrush (Scirpus acutus) (OBL)

PEMB

three square (Scirpus americanus) (OBL)

PEMC

three square (Scirpus americanus) (OBL)
fox sedge (Carex vulpanoides) (OBL)
water parsnip (Sium sp) (OBL)
sedge (Carex sp.) (Cyperus sp) (FACW-OBL)
dock (Rumex sp) (FAC-OBL)
horsetail (Equisetum, sp) (FACW)

PEMA

needle spikerush (Eleocharis acicularus) (OBL)
smartweed (Polygonum spp) (FACU-OBL)
foxtail barley (Hordium jabatum) (FACW)
saltgrass (Distichlis spicata) (FACW)
barnyard grass (Echinochola crusgalli) (FACW-DRA)
goldenrod (Solidago sp.) (FACU-FACW)
marsh elder (Iva sp) (FAC)
frogbite (Phyla cuneifolia) (FAC) (AKA: Lippia cuniata)
little barley (Hordium prisillium) (FAC)
burr ragweed (Ambrosia grayii) (FAC)
yellow clover (Melilotus officinalis)(FACU-DRA)
lambsquarter (Chenopodium album)

U

showy milkweed (Asclepias speciosa) (FAC)
fireweed (Kochia sp) (FACU)
cocklebur (Xanthium strumarium)
sand verbenia (Abronia fragrans)
japaneese brome (Bromus japonicus) (FACU)
downy brome (Bromus tectorum)
buffalo grass (Buchloe dactyloides) (FACU)
western wheatgrass (Agropyron smithili) (FAC-FACU)
bull thitle (Cirsium sp) (FACU)
common ragweed (Ambrosia artemsiifolia) (FACU-DRA)
pigweed (Amaranthus retroflexus) (FACU)
sand sage (Artemisia filifolia)
poison ivy (Rhus radicans)
Schenardus paniculatus
Festuca oxtifloria
Haplopappus ciliatus
common sunflower (Helianthus sp)
primrose (Oenothera grandous)
wild plum (Prunus americana)
bedstraw (Gallium sp)
prickly poppy (Argemone sp)
white clover (Melilotus albus)

IV IMAGERY

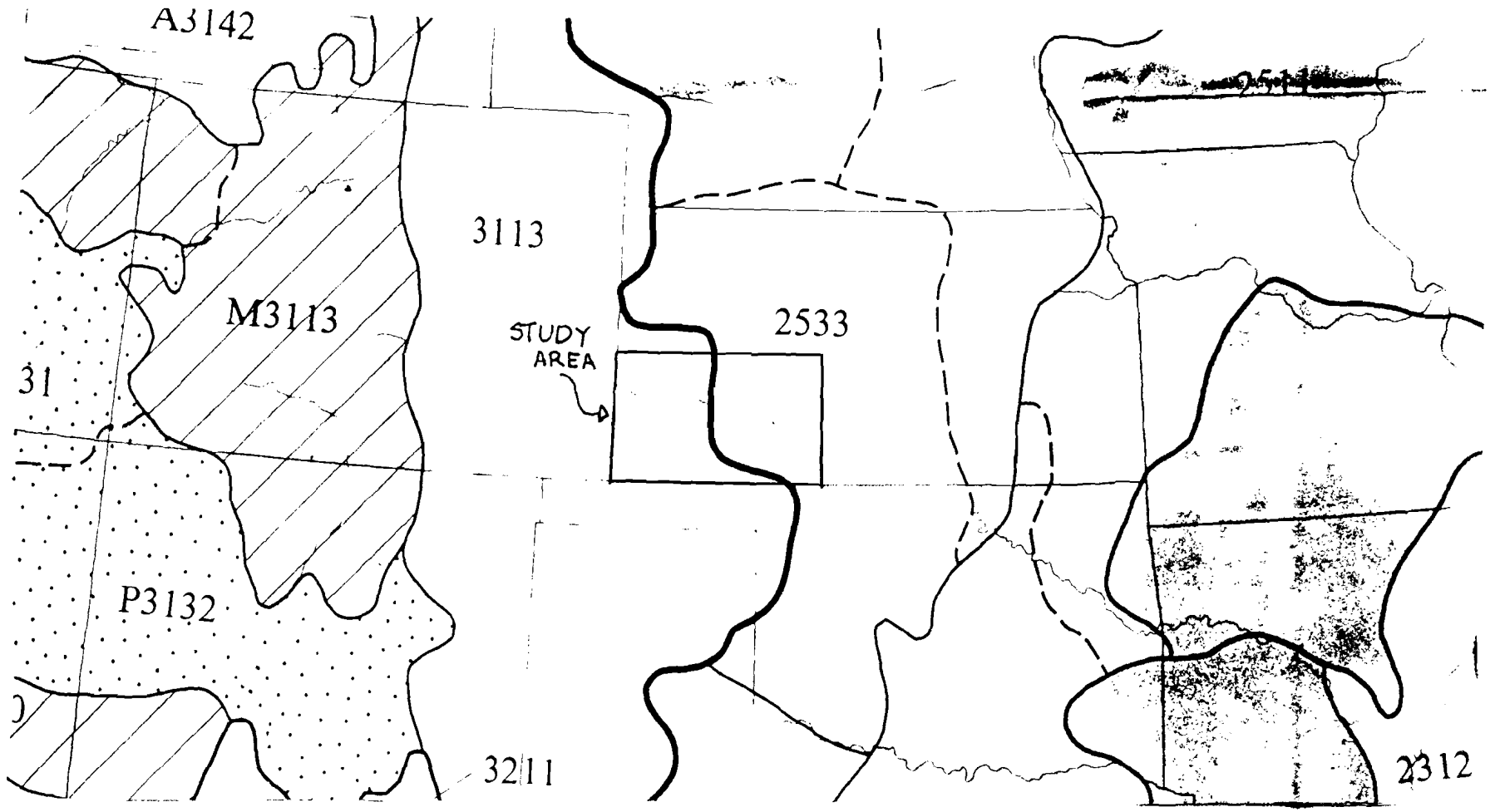
The imagery being utilized for this mapping effort is of relatively good quality with excellent resolution and acceptable emulsions. The photos were taken during the growing season from June 12 through Sept. 26, 1985. It was concluded during field reconnaissance that these various dates revealed differences in photo signature tones due largely to localized rainfall conditions. These differences were sometimes noted on photography of the same date as well as photography only a few days apart. In an attempt to rectify this situation and depict the most "normal" conditions, overlap and tie photography will be consulted as well as rainfall data as available.

Many photo signatures expected to represent wetland communities, especially riparian, were determined to be upland through ground thruthing. Conversely, wetland basin signatures not readily identifiable on the photography were discovered. These range from slight changes in soil tones to very distinct colors and textures. Soil surveys, topographic information, and photo overlap will be used to determine the best classification. (Refer to S.W. Kansas Photointerpretation Guildelines for more information).

V SUMMARY

The field trip revealed much about the wetland ecology of Southwestern Kansas and the photography being used in this mapping effort. In general, the intensive water usage and agricultural land practices have destroyed or altered much of the historic wetland communities, both riparian and basin playas. These alterations along with natural climatic conditions produce relatively little wetland habitat or diversity. With these understandings and the correlations made to the photography, the interpretation and classification of the wetlands should be facilitated.

NWI#49



Location of

Study Area