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United States Department of the Interior

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26 MAY 1983

MEMORANDUM

To: Assistant Regional Director, Habitat Resources, Region 6

From: Assistant Regional Wetland Coordinator, Region 6, Denver, CO

Subject: Nebraska Sandhills Field Trip Report

National Wetland Inventory maps will be produced from photointerpretation of NASA 1:65,000 color infrared photography taken in the spring of 1982. During May 3-12, Chuck Elliott and myself met with three photointerpreters from Martel (Steve Mortellaro, Les Vilchek, and Mike Colby) as part of an intensive effort to become familiar with wetlands of the Nebraska Sandhills. Ten days were spent in the field from O'Neill to Alliance. Photointerpretive issues have been resolved as follows.

Temporarily flooded emergent wetlands (PEMA) presented the widest range of photographic signatures. These wetlands are associated with the transition zone between wetland and upland which often presents a problem as to where the boundary of the wetland is to be drawn. Ephemeral wetlands, which are not recognized as wetland by the Cowardin System, often contained up to a foot of water during this field trip. Typical vegetation found in ephemeral wetlands was a predominance of Kentucky Bluegrass often with a small percentage of an unknown rush (Juncus sp.). While rush is often an indicator of seasonally flooded wetlands, this particular species is quite different and even under high water conditions was nearly always on upland sites as a periphery of the wetland. Attempts were made to eliminate the delineation of ephemeral wetlands. It should be recognized, however, that occasionally these ephemeral wetlands will be delineated because of the similarity of their signature to temporarily flooded emergent wetland signatures. Vegetation contained in temporarily flooded emergent wetlands includes combinations of sedge and/or rush with associated Kentucky Bluegrass and dock (Rumex sp.). Light red or tan tones located in basin depressions will be identified as PEMA. Similar tones in channels or on flat areas will be identified as upland. These latter areas are often associated with cattle grazing on upland sites. Mottled blue/gray tones and slate-colored tones will be identified as PEMA also. These basins tend to be deeper pocketed than the light red/tan colored basins but contain similar vegetation. The signature is also present within large subirrigated meadows which are not basin associated. Since many of these meadows are ditched, the partially drained modifier will be added to the classification (PEMAd). These temporarily flooded wetlands graduate into the ephermal

type wetlands with light red signatures discussed previously. Since these are not basin depressions the red tone will not be delineated as wetland.

Dark signatures in draws within cultivated fields will not be identified as wetland. In natural conditions, these areas tend to be grassed waterways often with an overstory of Box Elder (Acer negundo). Sufficient water is present to create a dark soil tone, but water is not present for a long enough period of time to allow the growth of hydrophytes. Many basins in cultivated fields, particularly where pivot irrigation is applied, are drained and will be classified as PEMAd. The ditches will not be delineated unless they are "major" (draining more than one pivot irrigated field or extensive wetland acreage of approximately fifty acres or more). The definition of "major" will be a subjective photointerpretive decision which will become better defined with experience. These ditches, which will be classified as R4SBCx or R4SBAx, have an effect of not only lowering water levels in basins which are being drained, but also of increasing water levels in basins which are being drained into. The classification of a basin within a pivot irrigated field as seasonally flooded (PEMC) will require strong evidence such as a deep pocketed basin or an indication of the farmer's inability to plow through the basin.

Seasonally flooded emergent wetlands (PEMC) are characterized by a solid blue (open water) signature. Occasionally, a mottled white signature appears within the blue tone, but blue is still the predominate signature. A white concentric band will sometimes surround the blue tone and will be included within the PEMC designation. This white signature also occurs in subirrigated meadows, often between semipermanently flooded emergent basins. Vegetation within seasonal wetlands is dominated (nearly exclusively) by the same sedges and/or rushes which seem to have a wide tolerance to a variety of water conditions. Spikerush (Eleocharis sp.) and occasionally cattail (Typha sp.) occur in seasonally flooded emergent wetlands also. Seasonal wetlands which occur in ditches will be identified with the ditched special modifier (PEMCx). Several fields exhibit a mottled appearance containing an interspersion of both light and dark blues and grays. Delineation will be a complex of polygons and linears of PEMC (dark blues and grays) and PEMA (light blues and grays).

Vegetation in semipermanently flooded wetlands (PEMF) includes cattail (Typha sp.) and hardstem bulrush (Scirpus acutus). The cattail signature is typically a white tone with a circular cloning pattern. Hardstem bulrush shows as a solid white tone usually surrounded by a solid blue open water signature. Semipermanent wetlands which occur in ditches will be identified with the ditched special modifier (PEMFx). Occasionally springs or flowing wells occur within semipermanently flooded emergent wetlands. The signature of springs is characterized by a bright red tone. Vegetation in these areas contains a great variety of species including pennywort (Hydrocotyl sp.) and surrounding sedges, rushes, and cattail. These springs will be considered as inclusions within the surrounding wetland type.

Woody vegetation was found to occur in wetlands. Both willow (Salix sp.) and cottonwood (Populus sp.) grew along rivers and streams. Willow tended to occur

in wetter areas, and where possible, will be identified as seasonally flooded forested (PFOC). These areas will contain trees and an understory of an open water signature (dark blue) or a dark gray. Occasionally, willow occurs in association with cattail and will be identified as PFO/EMC, where each species constitutes at least 30 percent of the wetland. Forested areas will more frequently be identified as temporarily flooded (PFOA). These areas contain cottonwood, willow, and occasionally box elder, elm (Ulmus sp.) and green ash (Fraxinus pennsylvanica). All forested habitat along rivers in the Nebraska Sandhills will not be identified as wetland. Much of the forested growth is riparian and water related but not wetland. These areas are on steep-sided channels or on second or third benches above the river. An attempt will be made to eliminate these latter areas from wetland delineation. Forested habitat along rivers will be identified in oxbows, areas with darker signatures, in areas that can be identified as being at the same level as the rivers and when the woody vegetation exists in close proximity or within other wetland types. Similarly, scrub/shrub will be identified as wetland along rivers and occasionally in basins. The principle scrub/shrub observed was willow and will be identified primarily as PSSC or sometimes PSSA. Willow, in combination with cattail, will be identified as PSS/EMC when both species constitute at least 30 percent of the wetland.

The advantages of early spring photography is maximum wetland identification. However, as discovered in Prairie Pothole photography, good water conditions can present problems in wetland typing, particularly with open water signatures. As discussed previously, shallow open water signatures will be identified as PEMC. Deep pocketed, steep-sided open water bodies less than 20 acres will be identified as semipermanently flooded aquatic bed (PABF). Although aquatic beds were not present at the time of the field trip, they are known to develop through the growing season in most wetlands. This rule also applies to excavated and impounded ponds (PABFx and PABFh respectively). It is recognized that some ponds may be intermittently exposed (G water regime), but it is photointerpretively impossible to make the break between F and G water regimes. All bodies of open water less than twenty acres will be considered to be less than two meters deep. This precludes classification of any body of water less than 20 acres as lacustrine. In conversation with the Soil Conservation Service, Nebraska Game and Parks, and private landowners, we realize that there are a few ponds that are deeper than two meters at low water but these are the exceptions and are not detectable on photography.

Similarly, lacustrine systems (bodies of water greater than 20 acres) will be assumed to be less than two meters deep at low water unless collateral data indicates otherwise. All lacustrine habitat less than two meters deep will be identified as L2ABF or L2ABG. USGS topographic maps will be utilized to make the break between water regimes as well as photographic signatures. Again, aquatic beds were not present at the time of the field trip but are known to develop through the growing season. Deep water habitat will be identified as L1UBG; or L1UBH where collateral data indicates that the lake has never gone dry. Nebraska's Sandhills Lakes by D. Bruce McCarraher will be used as collateral data to determine water depth in Nebraska Lakes.

A variety of riverine habitat will be identified in the Nebraska Sandhills. U.S. Geological Water Resources Data will be used as collateral data to determine periods of flow for rivers in the sandhills. Rivers where stream gauging stations show that the river has never gone dry will be identified as R2UBH (e.g., Niobrara, Elkhorn, Loup). Major rivers not identified in the USGS publication but which appear perennial on the photography will be identified as R2UBG. Conversations with the Department of Game, Fish and Parks, as well as others, indicate the presence of trout streams in the sandhills (e.g., Long Pine Creek). This stream type has not been observed as yet, but will be checked on future field trips (these streams mentioned are not in the first six priority maps to be photo-interpreted which were the focus of the first field trip). These streams may be classified as upper perennial (R3UBH). All other streams not discussed above will be classified as riverine intermittent streams. The water regime will be semipermanently flooded (R4SBF), seasonally flooded (R4SBC) or temporarily flooded (R4SBA) dependent upon the amount of water in the stream or available collateral data (e.g., major rivers have overflow channels which will be classified as R4SBC). Major irrigation canals will be classified as riverine intermittent semipermanently flooded excavated (R4SBFx). Other irrigation canals will be seasonally flooded (R4SBCx) or temporarily flooded (R4SBAx) dependent upon water conditions. Flats occur in perennial rivers particularly in lower reaches. These will be classified as seasonably flooded unconsolidated shore (R2USC) or temporarily flooded unconsolidated shore (R2USA) dependent upon the amount of water present on flats. Some unconsolidated shore areas were covered by ice jams at the time of photography. These areas were determined to be primarily R2USC.

Another photointerpretive issue resolved in the field involved the presence of snow at the time of photography. Primarily, areas covered by snow were found to be upland. Exceptions will be handled by photointerpreters based on their knowledge of sandhill wetlands.

As mentioned in this report, hydric soils and Soil Conservation Service soil surveys will be a valuable source of collateral data in mapping wetlands of the Nebraska Sandhills. Unfortunately, only a small portion of the sandhills has been mapped by the SCS in published soil surveys. Soils considered as hydric by the SCS (e.g., Barney, Gannett, Loup, Marlake, and Tryon) were found to be wetland nearly 100 percent of the time. Other soils having hydric characteristics, as determined by a review of soil surveys (e.g., Boel, Els, Elsmere, and Ord) also were found to be wet but not to the extent of soils on the list of hydric soils. These latter soils can be used as an additional piece of collateral information in borderline areas which photointerpreters believe are wet based on photographic signatures. A complete list of hydric soils and soils with hydric characteristics based on a review of available soil surveys will be provided to Martel.

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Overall, photography to be used for photointerpretation of wetlands of the Nebraska Sandhills is of excellent quality and will result in the production of accurate wetland maps. Martel will begin photointerpretation upon their return to Florida and will send the first three annotated photos to the Region for review. This will ensure that the Region and the contractor are in agreement on all photointerpretive issues. Photography for the remaining portions of the sandhills will be sent to the region for quality control review based on the previously established priority order.

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