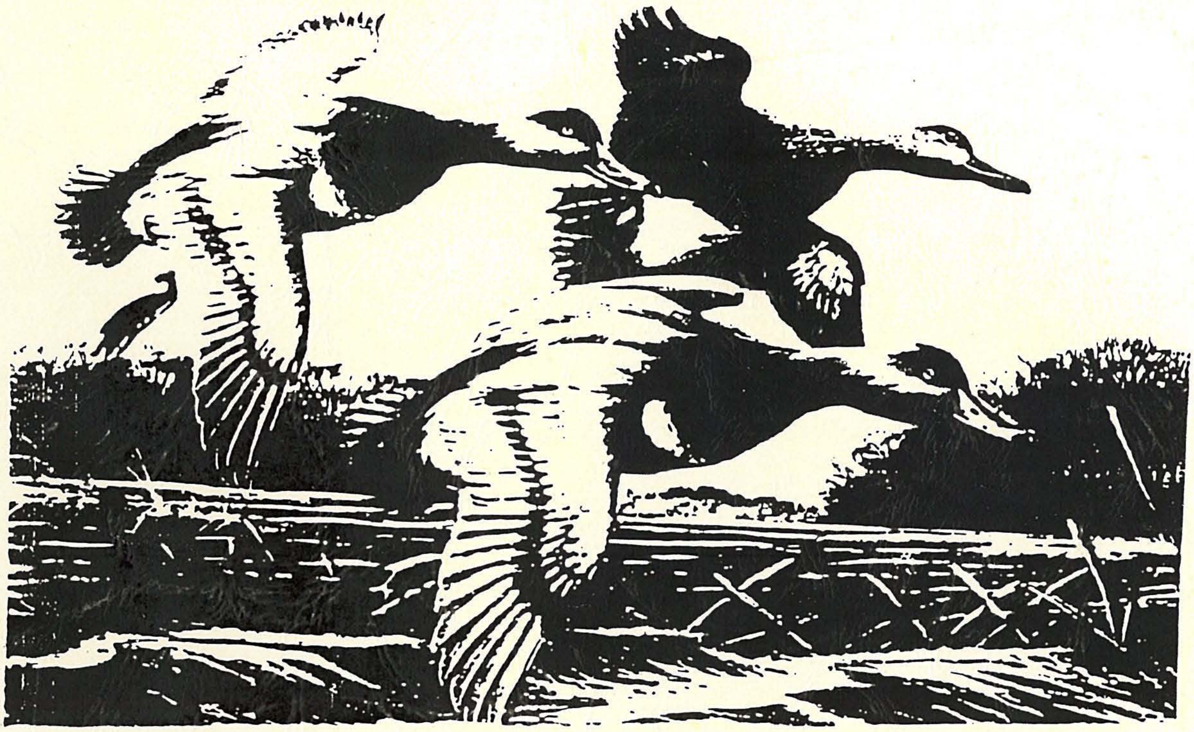

A WETLAND EVALUATION TECHNIQUE FOR USE WITH THE TRANS ALASKA GAS SYSTEM

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SUMMARY

Participating State and Federal agencies have developed a technique for evaluating wetlands for use along the Trans-Alaska Gas System (TAGS) project. The technique described in this paper has been designed to facilitate planning for construction of the pipeline and ancillary facilities in wetlands. This is required in the Federal right-of-way grant, the State conditional Right-of-Way lease, and other government permitting responsibilities. The use of the technique will also aid in the choice of any further mitigation measures under 40 CFR 1508.20.

The technique utilizes National Wetlands Inventory (NWI) mapping provided by the U.S. Fish and Wildlife Service as modified by the Wetlands Evaluation Working Group (WEWG). The technique is based primarily on fish and wildlife resource values as reflected in drainage and spatial characteristics of wetlands.

A point system is provided to rank the relative importance of each wetland and to categorize polygons into higher and lower value groupings. The system range is from 60 to 180 points, however actual wetland values varied from 60 to 160 points. The WEWG has decided that a wetland must receive a minimum of 140 points to be considered of higher value. Mitigation efforts will be concentrated in higher value wetlands, although, lower value wetlands will also receive consideration.

Important fish and wildlife wetland habitats, which can be documented separately, will be identified and considered higher value wetlands.

ACKNOWLEDGEMENTS

The WEWG was chaired by Gary Stackhouse (FWS). Other members participating in the WEWG included: Phil Brna and Mike Thompson (ADF&G); Jon Hall (FWS); Mike Kasterin (BLM); Mary Lee Plumb-Mentjes (USACE); Phil North and Linda Comerci (EPA); Jeane Hansen (NMFS); Harry Noah and Carl Yanagawa (YPC); William Mckenzie and staff provided valuable computer support under contract to YPC.

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INTRODUCTION

Project Description

Yukon Pacific Corporation (YPC) has proposed the Trans-Alaska Gas System (TAGS). The project is comprised of a 798.5 mile, 42 inch diameter gas pipeline from Prudhoe Bay to Anderson Bay in Port Valdez. The project would include a conditioning plant, compressor stations, a plant to liquefy natural gas (LNG), and a marine terminal (Figure 1). YPC has received a Federal Grant of Right-of-Way (F-83941 and AA-53559) from the Bureau of Land Management (BLM) and a State Conditional Right-of-Way Lease (ADL 413342) from the Alaska Department of Natural Resources (ADNR) for TAGS.

In 1988, prior to the grant of right-of way, an environmental impact statement (EIS) for the TAGS project was prepared by BLM and the U.S. Army Corps of Engineers (USACE) to fulfill requirements under the National Environmental Policy Act (NEPA). The EIS identified wetlands as an environment affected by the proposed TAGS project and recognized that wetlands performed important physical and ecological functions that deserved special consideration. The EIS presents a wetlands classification based on hydrologic and vegetative characteristics, and from this projected that 51 percent of the TAGS route would involve wetlands.

Regulatory Authorities

Under Section 404 of the Clean Water Act (CWA, 1977, as amended), the Secretary of the Army, acting through the USACE, is authorized to issue permits for the discharge of dredged or fill materials into the waters of the United States, including wetlands. Under authority of the Fish and Wildlife Coordination Act, the U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), and the Alaska Department of Fish and Game (ADF&G), review applications for these Federal permits and provide comments to USACE on environmental impacts of the proposed work. The Alaska Department of Environmental Conservation (ADEC) issues a Certificate of Reasonable Assurance under Section 404 of the CWA, insuring that state water quality standards will be maintained. The Alaska Division of Governmental Coordination (ADGC) must make a determination that the discharge would be consistent with the Alaska Coastal Management Program (ACMP), which includes provisions for the protection of wetlands.

A plan for construction in wetlands is required by both State and Federal land management agencies for the proposed pipeline (See Stipulation 1.7 in each land use authorization).

Wetlands Study

In order to fully address the TAGS wetlands issues, YPC initiated a wetlands study to delineate the amount of wetlands; determine their functions and values; and to provide recommendations to mitigate adverse impacts to these resources.

To assist in the completion of the study, a Wetlands Evaluation Technique for the TAGS project is developed herein. The technique has been designed specifically for the two mile wide TAGS corridor from Prudhoe Bay to Valdez. This large area (1600 square miles), contains a multitude of wetland types for which little specific information on their functions and values is available.

The Wetland Evaluation Technique (WET) is a system by which wetlands are evaluated and assigned a numerical rank based primarily on importance to fish and wildlife resources. The technique is intended for use by YPC to avoid siting facilities in higher value wetland areas and for use by regulatory agencies to assist in the project approval process.

A Wetlands Evaluation Working Group (WEWG) was formed in November, 1990 to develop an evaluation technique and to evaluate wetlands potentially impacted by the project. The WEWG consists of representatives from the FWS, BLM, EPA, USACE, ADF&G, ADEC, ADNR, and YPC.

Some of the initial concepts and background for WET are taken from a wetland evaluation system developed for YPC by Dames & Moore (Dames and Moore, 1990). The Dames and Moore system was not used in its entirety as WEWG believed it was too complex for timely implementation.

BACKGROUND

Wetlands Definition

The EPA and USACE developed a wetlands definition to be used in making jurisdictional determinations of wetlands regulated under Section 404 of the Clean Water Act. Wetlands are defined as:

> "Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas."

WEWG adopted this definition.

Wetlands Classification and Mapping

In 1979, the FWS published a wetland classification system (Cowardin, et. al.) to be used in their national inventory of wetlands and deepwater habitats. This system (ecological wetland units with certain homogeneous natural attributes) was adopted to provide uniformity of concepts and terminology to be utilized in the inventory and mapping of wetlands. Using the Cowardin classification system, the FWS has completed the National Wetlands Inventory (NWI) for the TAGS corridor (two miles in width) and has identified over 100 wetland types. The NWI mapping technique was reviewed by WEWG and deemed acceptable for use in developing the wetland evaluation technique.

Wetlands Functions and Values

Wetlands attributes, called functions and values, that make them valuable and productive resources have been identified in several publications (Adamus 1987, Kenai River Special Management Area Reports 1985, Euler D.L., et. al. 1985; Post, 1990; Dames and Moore, 1990; EPA, 1990). These were reviewed by the WEWG. All of the documents recognize a comprehensive list of functions and values as developed by the USACE (1979).

The USACE list includes:

A. Food chain production
B. General and specialized habitat for terrestrial and aquatic species
C. Aquatic sanctuaries and refuges
D. Hydrologic support
E. Shoreline protection
F. Storm and flood water storage
G. Natural ground-water recharge
H. Water purification

Additional cultural functions were included in the USACE list;

A. Commercial fisheries
B. Renewable resources and agriculture
C. Recreation
D. Aesthetics
E. Other special values

The WEWG also considered the merits of the Kenai River Plan (KRP) which had extensive agency and public review. This plan provided a precedent for a wetland classification system for Alaska. However, it was determined that the Kenai River Plan was developed specifically for the Kenai River area and was not wholly applicable to the diverse physiographic regions found along the TAGS right-of-way. Certain characteristics such as complexity and interspersion, were found to have merit and are included in this technique.

Dames and Moore Study

Adamus (1987), developed a rating system for wetlands based on the following functional attributes:

A. Recharge of ground water
B. Discharge of ground water
C. Flood control
D. Water quality control
E. Stabilization of sediments
F. Retention, removal and transformation of nutrients
G. Habitat for fish
H. Habitat for wildlife
I. Biomass production and export

In 1990, Dames and Moore modified these nine functions by eliminating, combining or adding criteria and proposed a rating system for the TAGS corridor wetlands. Their modifications are summarized as follows:

A. Little information was available for ground water hydrology hence water source was considered a more appropriate criterion.

B. Flood control was not considered an important function for most areas of the route because of the remoteness from human development. Potential flooding had been studied as part of the TAGS engineering considerations for route alignment.

C. The ability of wetlands to stabilize sediments and retain, remove and transform nutrients was combined into the water quality control function.

D. Subsistence hunting, fishing and trapping and recreation were added because these activities occur in some areas along the alignment of the pipeline.

E. It was postulated that wetlands vary in their ability to withstand disturbance, thus this attribute was added.

These modifications resulted in the identification of seven functions used in the Dames and Moore wetlands rating system:

A. Water source
B. Water quality
C. Food chain support and primary productivity
E. Wildlife habitat
F. Fish habitat
G. Recreation/subsistence
H. Vulnerability to disturbance

Assumptions Used by the WEWG

In order to meet our stated objectives, WEWG identified the following assumptions used in the development of WET:

A. The Trans-Alaska Gas Pipeline System has undergone extensive environmental analysis including the preparation of an EIS and both the State conditional Right-of-Way lease and Federal Right-of-Way Grant. As a result of this analysis, the proposed pipeline was routed to avoid major environmentally sensitive areas.

B. Conflicts with special fish and wildlife habitat areas would be the primary reasons to request a major shift in pipeline alignment, therefore, fish and wildlife considerations would be the major focus of the technique.

C. Due to the limited resources available for field work, the technique must be applicable within the office environment.

D. "Best Management (engineering/construction) Practices" will be utilized throughout project implementation to protect wetland functions and values.

E. Subsistence, social and recreational values of wetlands are recognized, however these values will be analyzed under other required impact documentation associated with the project and are not considered as part of this evaluation. For example, the State conditional Right-of-Way Lease requires that YPC develop a plan to address social impacts of the project.

F. Wetlands which are documented as supporting important life stages for fish and wildlife resources are considered higher value areas.

WETLANDS EVALUATION TECHNIQUE

Model Description

After reviewing the various wetland functions and values and assumptions it was decided that the objectives could be achieved by focusing on two sets of physical characteristics. Drainage characteristics relate to nutrient transfer associated with a wetland, while spacial characteristics relate more to physical habitat conditions for fish and wildlife resources. It is well documented that drainage and spacial characteristics represent key components of habitat quality of a wetland. These characteristics are readily identifiable on the NWI maps used for this technique.

In order to determine a relative value for TAGS corridor wetlands, WEWG devised a point rating system (ranging from 10 to 30) for characteristics being evaluated. The total of these points becomes the relative score of the wetland.

Functions to be Evaluated

A. Drainage Characteristics

Drainage characteristics identified by the WEWG as being the most significant are: Hydrologic Connection and Water Regime.

1. Hydrologic Connection

Several studies have shown that lakes connected to rivers support higher numbers of waterfowl than lakes that are isolated from river systems (McKnight 1962 and Murphy, et. al. 1984). Larson, et. al. (1988), found that wetlands open to river flooding are more productive than wetlands not open to flooding. Lensink and Derksen (1986), found that connected lakes in the Yukon Flats were less productive than isolated lakes subjected to periodic flooding and long periods of drawdown. Unfortunately, maps used for this project do not allow a distinction to be made between isolated ponds, and isolated ponds which are periodically flooded or have long drawdown periods. In general, the closer the wetland is to a river, lake or stream, and the more direct the hydrologic connection, the greater the functional values of a wetland. (KRSMA Reports 1985, Elliot and Finn 1984).Therefore, we chose the degree to which ponds and lakes are connected, as the major rating parameter. Isolated ponds and lakes which occur in areas subject to flooding will be identified for close scrutiny during the application of this technique.

Wetlands may also contribute indirectly to fish and wildlife values outside of the wetlands area, e.g. maintenance flows to downstream fish spawning or rearing areas. Subsurface connections are not directly evaluated because of insufficient data, however, high fish and wildlife use areas associated with subsurface flows have been documented and will be identified as part of the fish and wildlife use characteristics. The two possible scores under the Hydrologic Connection characteristic are:

a. Wetlands that share a common border with a lake, pond, river or stream; or are connected by a channel to a lake, river, stream or pond receive a score of 30 points.

b. Wetlands that do not share a common border or channel connection receive score or 10 points.

2. Water Regime: Tidal or Non-tidal

Water regimes are grouped under two major headings, tidal and non-tidal.

Tidal wetlands are considered to be of highest priority because of their fish and wildlife habitat value and their overall energy contribution to the marine environment. Due to the limited number of tidal wetlands along the TAGS alignment, tidal wetlands have been grouped with the higher value non-tidal wetland categories.

Non-tidal wetlands which contain the more permanent water regimes as opposed to those which are less permanent in duration, are also considered valuable because of the opportunities for fish spawning and rearing, waterbird nesting and furbearer use (KRSMA 1985, Lensink and Derksen 1986, and Bergman, et al. 1977). The National Wetlands Inventory system provides definitions for seasonally, semipermanently, permanently or temporarily flooded water regimes. Temporarily flooded wetlands are generally associated with riparian areas which are briefly flooded (two to four weeks per year). These areas are considered important for their energy contribution to riverine systems and habitat values. Non-tidal, saturated wetlands are generally considered to have the lower wetland values for fish and wildlife resources. We believe that those saturated wetlands with higher fish and wildlife values will be identified under the fish and wildlife use characteristics. The two possible scores under the Water Regime characteristic are:

a. Tidal wetlands or non-tidal wetlands that are seasonally, semipermanently, permanently or temporarily flooded receive a score of 30 points.

b. Non-tidal, saturated wetlands receive a score of 10 points.

B. Spatial Characteristics

Spatial characteristics are a measure of the value of habitat conditions for fish and wildlife resources. Four parameters, identified as being key indicators of habitat quality (Dames and Moore 1990, KRSMA Reports 1985, U.S. Environmental Protection Agency 1989, and Weller 1987), were selected for use in this evaluation technique. These are: Extent of open water, edge (complexity and interspersion), water regime, and vegetation life form.

1. Extent of Open Water

Dames and Moore (1990), identified a 30-70 percent range of open water as providing an optimal mix of food, cover and reproductive habitat. Other authors have identified a 50:50 ratio between cover and water as being optimal (Weller and Spatcher 1965 and Golet and Larson 1974). It is recognized however, that areas of open water greater than 70 percent or less than 30 percent of the total wetland acreage, may represent higher value habitat for a particular species, e.g. swans. We have not tried to address all of these situations but have rather assumed that the majority of higher value wetlands fall in the 30 percent to 70 percent range. It should also be noted that mapping limitations may preclude the identification of areas which contain less than 30 percent open water (Hall personal communication). The two possible scores under this characteristic are:

a. Wetlands with 30-70 percent open water receive a score of 30 points.

b. Wetlands with less than 30 percent or greater than 70 percent open water receive a score of 10 points.

2. Edge: Complexity and Interspersion

The edge between two plant species of different physiognomy is a major feature influencing nest location of waterfowl (Weller 1964 and Coulter and Mendall 1968) and of many other wetland birds (Beecher 1942 and Weller and Spatcher 1965), and Golet and Larson 1974). Wildlife abundance appears related to total length of edge, while wildlife diversity is a function of the number of different configurations of edge (Golet and Larson 1974).

In order to address this characteristic we have chosen to evaluate two components of edge, i.e. complexity and interspersion. The edge rating for a particular wetland is the highest value associated with either of the components, e.g. if a wetland receives a rating of 30 for complexity and 10 for interspersion, its rating for this characteristic is 30.

a. Complexity is a measure of diversity among wetland types or among wetland types and uplands (Figure 1).[1] The nature of the surrounding habitat is an important consideration in evaluating wetlands since many waterfowl species depend upon adjacent upland areas for food and nest sites (Golet and Larson 1974). The diversity of vegetation supplies more food and habitat for a richer assemblage of wildlife species (Larson et al. 1988, Adamus, et al. 1987 and Lensink and Derksen 1986). The two possible scores for complexity are:

    i. A wetland in proximity to three or more wetland or upland types receives a score of 30 points.

    ii. A wetland in proximity to two or fewer wetland or upland types receives a score of 10 points.

b. Interspersion is a measure of how a wetland is distributed in relation to surrounding types, or a measure of diversity within the wetland type (Figure 2). The two possible scores for interspersion are:

    i A highly interspersed wetland receives a score of 30 points.

    ii. A wetland with low interspersion receives a score of 10 points.

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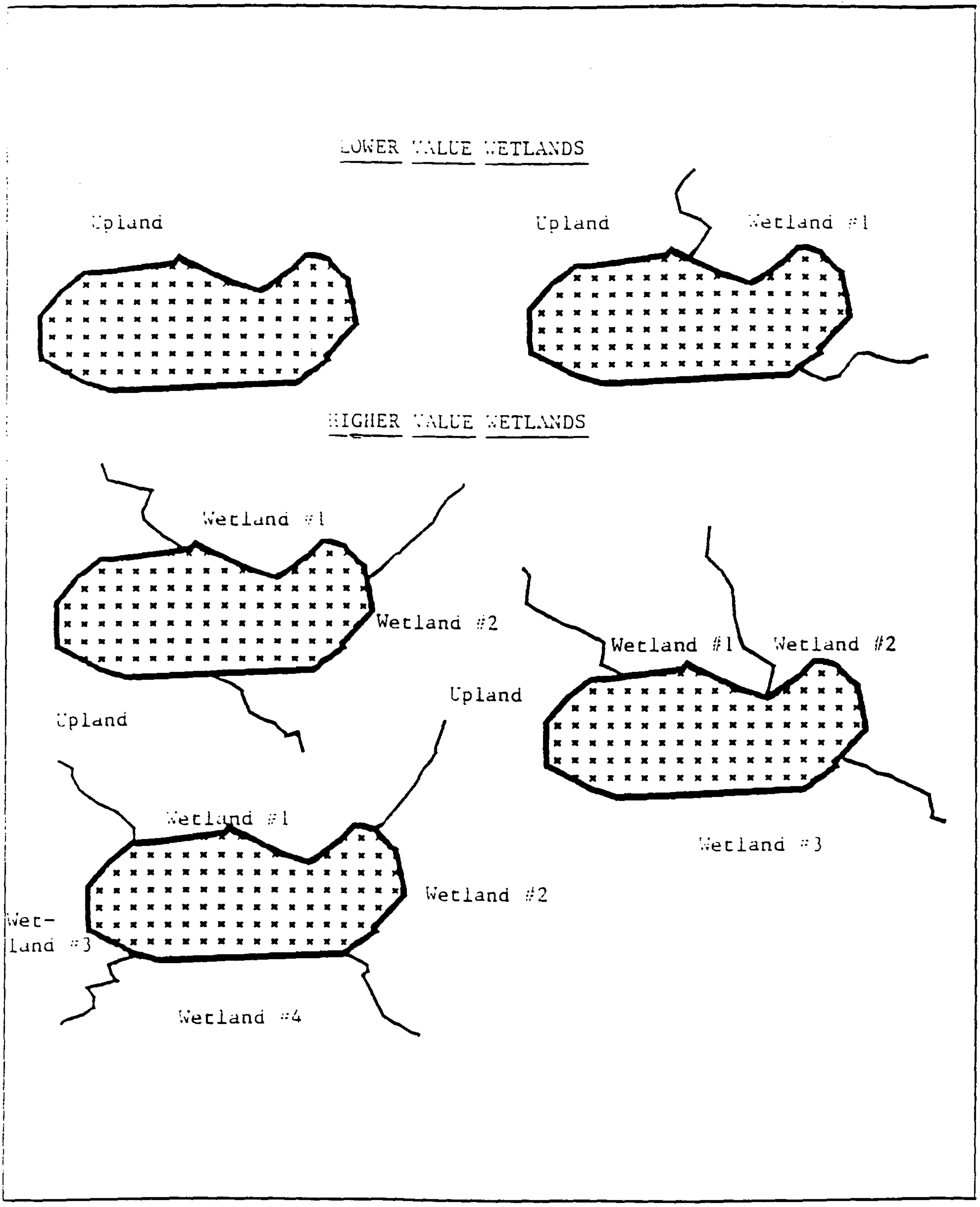
1 Adapted from the KRSMA reports, 1985. This report however, assigned values for adjacent wetland types only. We have assumed that similar values are obtained from adjacent upland types as well as wetland types. Uplands are not classified.

Figure [illegible]

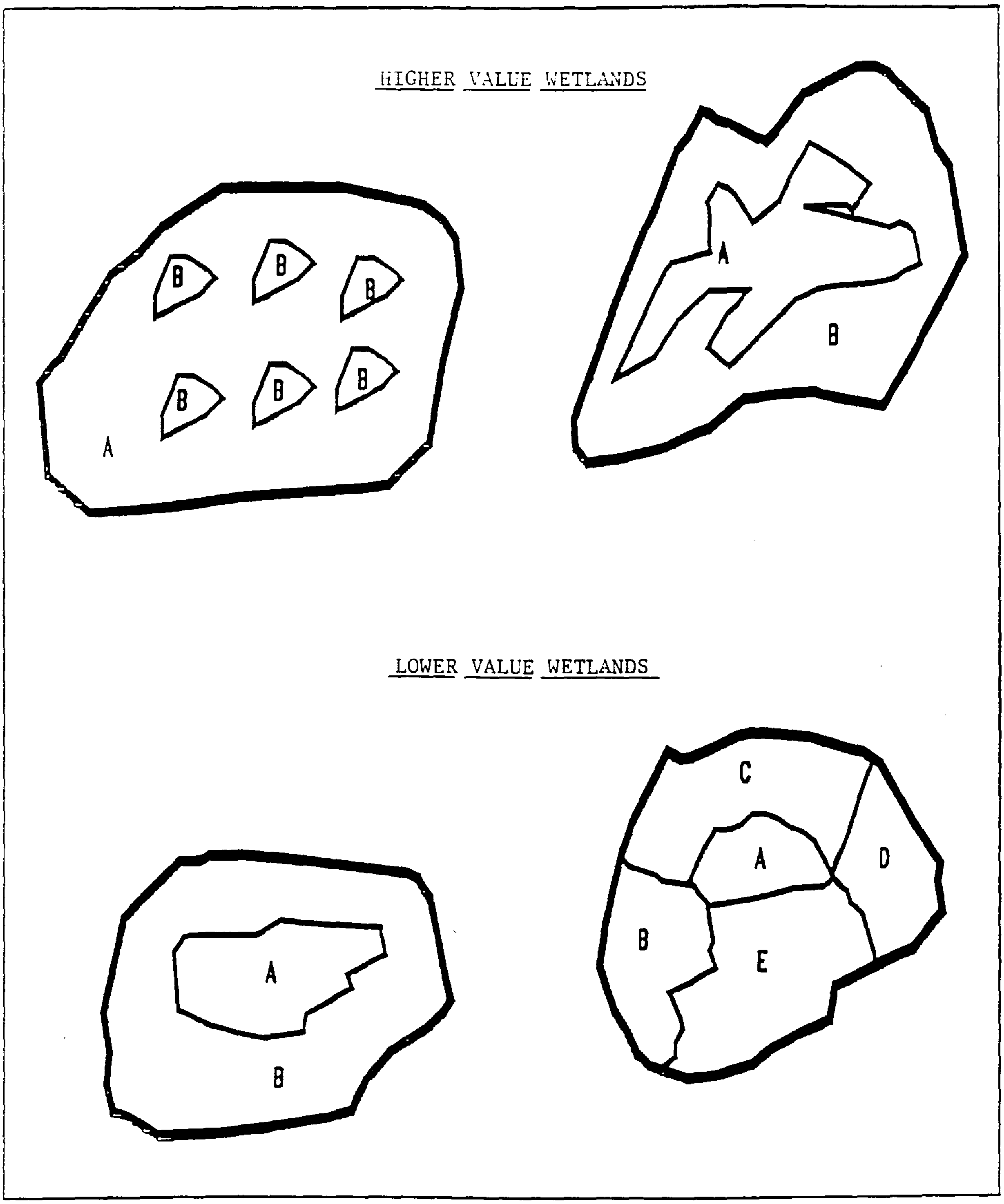
EXAMPLES OF COMPLEXITY**



* xxx = wetland being evaluated

** A measure of diversity between wetlands or between wetlands and uplands.

Figure 2* EXAMPLES OF INTERSPERSION**



* A=area being evaluated

** A measure of how the wetland type is distributed in relation to surrounding types or diversity within the wetland type.

3. Vegetation Life Form

This characteristic provides an index of the prevalent type of vegetation within the wetland. Emergent vegetation types for instance, support a wide variety of waterfowl and other bird species (Lensink and Derksen 1986). Bergman, et al. (1977), found that the vegetation types utilized most frequently by loons and waterfowl were those located in deep-Arctophila and basin-complex wetlands. Scrub-shrub and forested wetlands are generally considered to be lower in value (KRSMA Report).

Coastal wetlands in the region are often a major component of stream/estuary ecotones. These ecological interfaces serve as important habitat to salmonid fish species (Merrell and Koski 1979) and migratory waterfowl.

The WEWG recognizes that some scrub-shrub types may be very important to wildlife species in some areas, particularly on the North Slope. We believe however that these values are accounted for in other parts of the evaluation. For example, riparian scrub-shrub habitat will be rated higher under part A.1.a., drainage. The two possible scores for this characteristic are:

a. Those wetlands typed as emergent, aquatic bed, open water and estuarine intertidal (E2) classifications receive a score of 30 points. The Open Water classification usually support emergent vegetation, aquatic bed life forms, or both, while estuarine intertidal areas are generally covered with algal communities (Hall, personal communication). We have included these classifications as a whole since partially vegetated areas may or may not be detectable on aerial photography.

b. Scrub-shrub, Forested, Unconsolidated shore classifications receive a score of 10 points.

4. Wetland Scarcity

In some cases it is recognized that some wetlands (emergent and open water) have higher value because they may provide the only open water or freshwater marsh in an otherwise homogeneous polygon, e.g: black spruce bog. In other cases, some wetland types such as Estuarine Intertidal (E2) are very uncommon within the project area and are very important for energy contribution and support of fish and wildlife

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Groupings done by the work group in consultation with Jon Hall, NWI Coordinator, USFWS.

resources, particularly at the terminal site in Anderson Bay. WEWG has therefore, decided to include this characteristic in the evaluation technique. The two possible scores for this characteristic are:

a. If a particular wetland is 5 percent or less the size of the surrounding wetland type or is classified as E2 it receives a score of 30 points.

b. If a particular wetland is greater than 5 percent the size of the surrounding type it receives a score of 10 points.

Fish and Wildlife Information

Documented wetland use by fish and wildlife resources will be used to verify high value areas identified by the Evaluation Technique. Areas documented as being important fish and wildlife habitats have been mapped and are included in the YPC geographic information system (GIS). The information will also be used to show additional areas which may not have been previously highlighted. Areas can be classified as follows:

A. Fish

1. Wetlands which provide fish habitat (spawning, rearing or overwintering) are considered as higher value.

2. Wetlands which do not provide fish habitat are considered lower value.

B. Wildlife

1. Wetlands which provide important life stage habitat are considered to be higher value. This is limited to life stages where the species of concern are essentially immobile or must occupy special habitats, e.g. avian nesting, core moose or caribou calving areas, mineral licks, and core wintering areas.

2. Wetlands which do not provide important life stage habitat are considered to be lower value.

MODEL TESTING AND DELINEATION OF HIGHER VALUE WETLANDS

In order to assess how accurate the technique identifies higher and lower value wetlands in the TAGS corridor, three sample quads were selected for evaluation, and included; Beechey Point, Gulkana and Valdez. Maps were generated by YPC showing the polygon classifications and ratings.

An evaluation team consisting of representatives of ADF&G, USACE, FWS, BLM and USCG. It was found that in general, those polygons typed as lakes, ponds, rivers (including riparian areas), estuarine and permanently flooded fresh marshes received ratings of 140 points or higher. Shrub-scrub, forested and tundra types with saturated water regimes received less than 140 points.

Overall, these ratings appear to be consistent with the values associated with these types identified by various authors previously cited. Based on this analysis it has been determined by the WEWG that wetlands with a rating of 140 points and above will be classified as higher value.

There were several limitations noted while testing the technique. All of them are associated with mapping constraints for example; smaller wetlands ponds (less than 1 acre) and streams are not mapable at the scale utilized by the NWI. Secondly, drainage characteristics are not always obvious on the mapping system. To minimize the effects of these limitations, suspected problem areas will be field checked.

CONCLUSION

This wetlands evaluation technique has been developed in cooperation with several resource agencies and YPC representatives for use on TAGS. It has been designed specifically for this project and is not intended to be used for other development scenarios. The cooperating agencies agree that this rating procedure is acceptable as an initial step in the permitting of the project as it relates to wetlands. The system identifies wetlands with a rating of 140 points and above as having higher value. It is recommended that wetlands with ratings of 140 points or higher as well as important fish and wildlife use areas be avoided.

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GLOSSARY

Autocad: Computer software used to design systems, in this case, a geographic information system.

Best management practice: An optimized procedure for construction based upon state of the art techniques and knowledge.

Complexity: A measure of diversity between wetland types or between wetland types and uplands (see examples, Figure 1).

Conditional lease: The instrument used by the State of Alaska Department of Natural Resources to conditionally grant a right-of-way for pipeline purposes pursuant to AS 38.35 to the conditional lessee, YPC, but granting no rights including preference or priority.

Drainage: Hydrologic connection to a permanent water body.

Function: The natural specialized action of a wetland.

Geographic information system: A computer based system which allows the input, storage, analysis, and display of a great volume and variety of physically locatable data.

Hydrologic regime: The natural fluctuation and permanence of water in a wetland.

Interspersion: A measure of how the wetland type is distributed in relation to surrounding types or diversity within the wetland type (see examples, Figure 2).

Mitigation: As defined in 40 CFR Part 1508.20:

a). Avoiding the impact altogether by not taking a certain action or parts of an action.

b). Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

c). Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

d). Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

e). Compensating for the impact by replacing or providing substitute resources or environments.

Physiognomy: The apparent characteristics; the outward features or appearance.

Raster image: An image based upon cell data arranged in a regular grid pattern in which each unit or cell in the grid is assigned an identifying value based upon its characteristics.

Right-of-way: The granted nonpossessory, nonexclusive right to use Federal land for the limited purpose of construction, operation, maintenance, and termination of a pipeline (43 CFR 2880.0-5 (n). This right is similar to an easement, which does not convey title to the land but allows only a specific use.

Riparian: Pertaining to a streamside environment. Includes vegetation growing in close proximity to a watercourse.

Unconsolidated shore: That part of a wetland classification referring to the compactness of the soil type.

Value: Characteristics of a wetland which represent its worth.

Vector format: Data comprised of x-y coordinate representations on the earth; taking the form of single points, strings of points (lines), or closed lines (polygons).

Vegetation life form Vegetation type, i.e. shrub-scrub, emergent, forested and aquatic bed.

APPENDIX

IMPLEMENTATION OF TECHNIQUE

I. Wetlands Mapping and Data Capture Methodology:

The National Wetlands Inventory mapping being done for the project has identified over 100 wetland types throughout the corridor. Concurrent with the completion of the wetlands mapping, YPC contractors will load the NWI maps, including <u>all</u> types into their GIS system, the source for the wetlands polygon data are hand drafted quad sheets at one of 2 scales: 1:63360 or 1:4000.

To convert the raster images to vector format, the images are displayed behind an AutoCAD drawing. Adjustments to scale, rotation, and position are made to the images so that they closely match the TAGS GIS quad sheet boundaries. Polygons that close within a reasonable distance outside the 2 mile corridor are drawn entirely. Polygons that extend more than a reasonable distance outside the 2 mile corridor are closed with a vector at a convenient location outside the corridor.

To provide validation to the process, customized AutoCAD menus are used for input of wetlands coding in each polygon. Polygon identifier (number), system, subsystem, class, subclass and modifiers are stored in separate fields in the polygon tag.

Processing an overall rating of individual wetland polygons is performed on the finished polygons. The overall rating is a sum of factors assigned to Drainage, Extent of Open Water, Edge (Complexity and Interspersion), Water Regime, Vegetation Life Form and Scarcity.

Finally, the polygon data fields and geometry are loaded into the GIS system in a continuous coverage.

II. Application:

The first part of the evaluation will be completed in the office, utilizing corridor maps produced by YPC. These maps will depict NWI wetland types for each polygon, as well as a computer assigned value based on the wetland evaluation characteristics. The objectives of this exercise are to identify the higher value wetland areas; to identify those areas where there is insufficient information to determine the relative value of the wetland; and identify areas where a potential conflict may exist. Higher value areas will be highlighted either by cross-hatching or color coding. Areas of concern will be high-lighted in a similar manner.

The evaluation will be done by a selected team of WEWG members consisting of representatives from YPC, the U.S. Fish and Wildlife Service, and the Alaska Department of Fish and Game. Additional members may be identified by the U.S. Bureau of Land Management, Alaska Departments of Environmental Conservation and Natural Resources, Corps of Engineers and the Environmental Protection Agency.

The second part of the evaluation will consist of on-site visits to those areas identified in part 1, and will be completed by the same team.

III. Results:

After completion of Parts 1 and 2, WEWG will convene to identify the appropriate mitigation measures which could be used to offset adverse impacts to wetland resources. Higher value wetlands will receive priority attention for replacement in-kind or appropriate compensation. The results of this analysis will be incorporated into the Mitigation Workbook for the project.