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Interpretive Potential of South Dakota Wetlands

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INTERPRETIVE POTENTIAL OF SOUTH DAKOTA WETLANDS

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This thesis is approved as a creditable and independent investigation by a candidate for the degree, Master of Science, and is acceptable as meeting the thesis requirements for this degree, but without implying that the conclusions reached are necessarily the conclusions of the major department.

Head
Department of Wildlife — Date

Thesis Advisor — Date

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INTERPRETIVE POTENTIAL OF SOUTH DAKOTA WETLANDS

Abstract

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A study was initiated to devise a method for selecting prairie wetlands on which nature interpretation areas could be established. An evaluation form was designed to systematically identify areas of good potential and 64 prairie wetlands were evaluated. Twenty-two percent of the evaluated marshes were found to rank "excellent": the method of evaluation was determined successful.

A survey was initiated to determine visitor preferences for interpretive methods and facilities at an existing wildlife-interpretive trail. Seventy-nine percent of the visitors indicated preference for a self-guiding interpretive trail. Maps and pictures used in conjunction with self-guiding signs were deemed important. Ninety-one percent believed that natural features and wildlife on prairie marshes would be interesting enough to justify interpretive facilities. This, and other information gathered, should be considered when establishing interpretive areas on prairie wetlands.

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INTRODUCTION

With a continually growing public interest in the environment, an ever-increasing number of people are finding rest and recreation in the outdoors.

To fully appreciate our natural resources, especially wildlife, we must better understand the attitudes and ideas comprising conservation science (Van Deusen 1968). Through such understanding, we will be able to utilize our resources to the greatest extent with the least damage to them.

Possibly the best way to accomplish these ends is through the use of outdoor, or nature, interpretation. Carr (1968) defined nature interpretation as a branch of communications which operates by explaining the features of the outdoors in terms meaningful to man. Interpretation can, therefore, provide understanding of nature as well as a form of recreation while gaining this knowledge. Interpretive activities deliberately designed to enhance visitor enjoyment of an outdoor area do so by developing understanding of visitor interests (Brockman 1959). It should be remembered, however, that facts alone do not equal interpretation. Tilden (1957) stated that interpretation and information are two different entities and only when facts result in revelation is interpretation achieved.

A study of the potential for interpretation of wetland areas in eastern South Dakota was carried on in January, 1970, through October, 1970. The purposes were twofold: first, to evaluate any prairie wetland, determining if the marsh and surrounding upland might

be suited to development of interpretive facilities; second, to establish by what means this interpretation might be most effectively accomplished.

DESCRIPTION OF STUDY AREAS

Phase I of this study was carried out in that portion of South Dakota lying east of the Missouri River. Visher (1918) described this section of the state as being prairie plains, an area of alternating river valleys and glacial coteau.

Most wetlands in this area occupy small depressions carved from the landscape by advancing and retreating glaciers of the recent ice ages. These prairie wetlands are provided with water primarily from melting snow and, infrequently, from widely scattered, heavy rains. Average annual precipitation is approximately 22.3 inches (Visher 1918).

Phase II of the study was conducted at Mahnomen Wildlife Trail, located in Sherburne National Wildlife Refuge, Minnesota, approximately forty miles northwest of Minneapolis. In contrast to the prairie wetlands of South Dakota, Sherburne Refuge occupies an area of mixed prairie, hardwood forest and marshes along the St. Francis River (U. S. Department of Interior, Fish and Wildlife Service 1966).

The self-guiding nature trail at this refuge was selected because of its proximity to a large metropolitan area, which assured an adequate number of visitors for the study. The trail divides into three loops, each one of increasing length. A large map at the trailhead depicts the area in detail (Fig. 1). The Mounds Loop, one mile in length, travels through an area of primitive Indian mounds and woodland. At about one-third mile around this loop, the Marsh Loop diverges, passes through a marsh by means of a floating boardwalk, and rejoins the Mounds Loop near its end, for a total length

of 1 3/4 miles. Finally, the Hiker's Loop leaves the Marsh Loop part way around and continues through woodland with no interpretive signs. It converges with the Marsh Loop before rejoining the Mounds Loop, and is about 2 1/2 miles in total length.

Fig. 1. Trailhead map of Mahnomen Wildlife Trail, Sherburne National Wildlife Refuge, Minnesota.

METHODS

Wetland Evaluation

An evaluation form was devised so that it could be applied to any wetland areas in midwestern glaciated prairies (Fig. 2). This form was designed for use by any person, group or agency desirous of determining the interpretive potential of a prairie marsh. With a few minor changes it could be used to evaluate wetlands in any part of the nation.

An orderly approach in determining considerations for a prospective interpretive site was deemed necessary. Quade (1966) termed such an orderly, analytic method of identifying a preferred course of action from a number of alternatives a "systems analysis." This approach seems most reasonable in defining what constitutes a prime marsh and associated upland for creating an effective interpretive facility.

Each wetland was rated by a point system according to its interpretive potential. Categories included: (1) location in relation to nearby highways and towns or tourist facilities, (2) natural features of the marsh and its surrounding upland, (3) necessary development for use as an interpretive-recreational tract. Within each category alternatives were provided from which the evaluator could select one most closely fitting a feature of a particular wetland.

WETLAND EVALUATION FOR INTERPRETIVE DEVELOPMENT

Name and/or Location of Wetland _____

_____

I. Location

A. Wetland is located near (circle one):

20	1. interstate highway interchange
15	2. U. S. highway
10	3. state highway
5	4. other hard-surfaced highway

B. Wetland is (circle one):

10	1. adjacent to highway
7.5	2. within 1 mile of but not adjacent to highway
5	3. 1-2 miles from highway
2.5	4. 2-3 miles from highway

C. Area has within 5 miles (circle one):

20	1. town with gas, food and lodging
15	2. recreation area or tourist attraction
10	3. camping facility or rest area

II. Natural Features and Interpretive Potential

A. Wetland type dominating prospective area (circle one)

15	1. deep basin; open water
10	2. shallow basin; much aquatic veg.
5	3. shallow; usually dry

B. Interpretive potential of land surrounding (circle any number)

2.5	1. extensive upland (suitable game bird habitat)
2.5	2. native prairie
2.5	3. stream bottom
2.5	4. woodland (or large shelterbelt)
2.5	5. glacial or geologic formations
2.5	6. historical or archeological sites

Fig. 2. Wetland evaluation form designed for use on glaciated prairie wetlands.

III. Existing Facilities and Necessary Development

A. Access to wetland area (circle one):

7.5 1. access directly to highway
5 2. has spot suited for development of highway access
2.5 3. indirect or no access to highway

B. Wetland area has high ground suited for (circle one):

5 1. parking and/or picnic area
2.5 2. small turn-out area only

C. Existing wetland in good condition; little or no development needed (circle only if applicable)

5

D. Existing upland clear of structures and cropland; is in grass or suitable cover (circle only if applicable)

2.5

_____ TOTAL (100 points possible)

Fig. 2. (continued).

Each alternative was assigned evaluation points, and points for each feature of the wetland were totaled for a composite rating. Wetlands receiving 70 points or more, on a 100 point scale, were given an "excellent" rating. Such tracts should be given prime consideration when selecting a site for development of an interpretive-recreational area.

Wetlands which were not rated "excellent" because of their locations had to have relatively high point totals in the other categories. For purposes of the study only an "excellent" rating was established. Any wetlands given less than 70 points would not be as valuable for interpretive development. Those given extremely low ratings were of little or no interpretive value.

Sixty-four waterfowl production areas, administered and managed by the Bureau of Sport Fisheries and Wildlife, were chosen for tests of this evaluation system. It was expected that this method of evaluation, if constructed properly, would reveal that a relatively small number of wetlands are suitable for development as interpretive areas.

Utilizing traffic-flow data obtained from the South Dakota Department of Highways, the seven most heavily traveled highways in eastern South Dakota were selected. These included Interstate 90, U. S. Highways 14, 212, 12, 81 and 281 (Fig. 3). Although U. S. 77 is very heavily used, it was not included in the study because of construction on Interstate 29 running approximately parallel and adjacent to it. All wetlands selected for evaluation were to be partially or entirely within 3 miles (arbitrary distance) of the main highway.

Visitor-Use Survey

In order to determine preferred interpretive methods and facilities, a visitor-use survey was made on weekends and holidays July 1 to November 1, 1970, at Mahnomen Wildlife Trail in Sherburne National Wildlife Refuge. Visitors were interviewed on a personal, informal basis using standard questions (Fig. 4). Preferences were established from these interviews. The interviews were then used to suggest methods of interpretation that might be constructed in creating similar interpretive facilities on prairie wetlands.

When conducting the interviews only one person from each party was questioned because many parties were family groups. It was assumed that this procedure might eliminate possible influences of one person on other persons in the group.

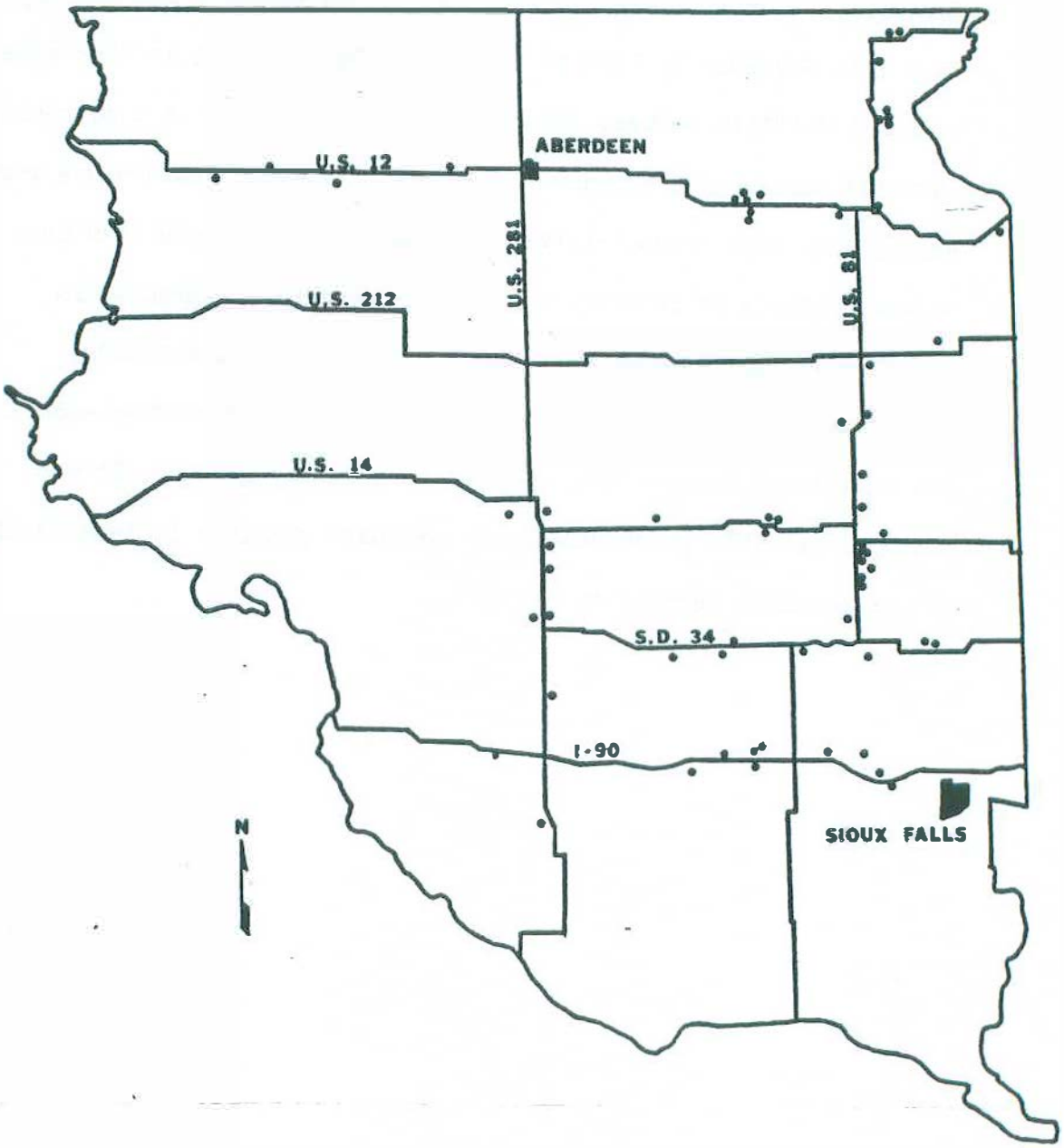

Fig. 3. Seven most heavily traveled highways in eastern South Dakota and location of wetlands in study.

NATURE INTERPRETIVE TRAIL VISITOR SURVEY

Date: _____

I. Party Information.

1. Type of trip:
   _____ vacation
   _____ local visit
   _____ business trip
   _____ school or group visit
   _____ other

2. Size of party:
   _____ number of adults
   _____ number of children

3. Origin of party (City and state or nation):
   _____

II. Impressions of trail features:

1. This trail was:
   _____ not long enough to allow seeing all the natural features present.
   _____ sufficiently long to allow seeing all the natural features present.
   _____ longer than necessary to allow seeing all the natural features present.

2. Did you enjoy the use of the self-guiding signs? ____ Yes ____ No

3. What type of nature walk would you prefer?
   _____ trail with self-guiding signs
   _____ trail with self-guiding leaflet or booklet
   _____ tour led by a naturalist
   _____ other (please list below)

   _____

   _____

   _____

   _____

4. Were the self-guiding signs along this trail easy to read and understand? _____ Yes _____ No

Fig. 4. Standard questions asked visitors at Mahnomen Wildlife Trail.

5. Was the amount of information on the signs sufficient to explain various natural features? _____ Yes _____ No

6. If pictures or maps were present on the signs, were they useful in explaining or helping you see a particular trail feature? _____ Yes _____ No

7. Which loop of the trail did you enjoy most? _____

   Is there any reason why you preferred this loop? _____

   _____

   _____

8. What was your primary reason for visiting this nature trail?
   _____ a rest or recreation stop on a long trip or vacation.
   _____ enjoyment of outdoor scenic beauty.
   _____ nature photography.
   _____ nature education for children.
   _____ nature education for adults.
   _____ nature education for adults and children.

   (list other below only if response cannot fit in one of the above categories).

   _____

   _____

9. If a nature trail were nearer your home, how often would you visit it? ____ once or twice ____ occasionally ____ often

10. Do you think that natural features and wildlife of prairie (or grassland) and marshes of eastern S. D. might be interesting enough to establish trails in those areas? _____Yes _____No

11. Do you have suggestions you feel might improve this type of nature interpretive trail? (If so, please list below).

    _____

    _____

    _____

Fig. 4. (Continued).

RESULTS AND DISCUSSION

Wetland Evaluation

Of 64 wetlands evaluated, 15 (or 23 percent) had excellent potential for developing interpretive-recreational facilities (Table 1). The mean evaluation score for those wetlands rated "excellent" was 75.5. Those not given an "excellent" rating had a mean score of 54.1.

The wetland areas rated "excellent" had some characteristics in common. All were located near an Interstate Highway interchange or near a U. S. Highway. Most were within 5 miles of a town, and many of the marshes on these tracts were deep, permanent bodies of water.

Visitor-Use Survey

Interpretive trail visitor statistics.--One hundred twenty-four parties were interviewed in the visitor survey, and a number of trends were determined (Table 2).

The parties represented 582 visitors. Of these, 299 (51 percent) were adults and 283 (49 percent) were children. In all parties except one, children were accompanied by adults. This exception was a group of four high school youths.

Of the 124 parties, 11 percent indicated they were on a vacation when they visited the trail; 86 percent were local residents. "Local" was considered to be within a 60-mile radius of the trail, or approximately one hour's driving time.

Table 1. Summary of wetland evaluation.

	Number	Percent	Range of Evaluation Points	Mean Evaluation
Wetlands rated "excellent"	15	23	70-82.5	75.5
Wetlands rated less than "excellent"	49	77	40-67.5	54.1

Table 2. Nature interpretive trail visitor survey summary.

	Number of parties responding	Percent
Party Information		
1. Type of trip:		
vacation	14	11
local visit	106	86
business trip	0	
school or group visit	4	3
other	0	
2. Size of party:		
total--		
adults	299	51
children	283	49
by type of visit--		
vacation	53	9
local visit	463	80
group visit	66	11
3. Origin of party:		
Distances traveled varied from 6 miles (Zimmerman, Minn.) to 1300 miles (New York, New York).		
Impressions of Trail Features		
1. This trail was:		
(a) not long enough to allow seeing all the natural features present.	6	5
(b) sufficiently long to allow seeing all the natural features present	115	93
(c) longer than necessary to allow seeing all the natural features pr		2

Table 2. (Continued)

	Number of parties responding	Percent
2. Did you enjoy the use of the self-guiding signs?		
Yes	124	100
No	0	
3. What type of nature walk would you prefer?		
(a) trail with self-guiding signs	98	79
(b) trail with self-guiding leaflet or booklet	6	5
(c) tour led by a naturalist	9	7
(d) other	11	9
(tour led by naturalist for groups)	(1)	(1)
(tour led by naturalist for youngsters	(1)	(1)
(no interpretation)	(1)	(1)
(no preference)	(1)	(1)
(no preference between trail with self-guiding signs or trail with self-guiding leaflet)	(3)	(2)
(no preference between trail with self-guiding signs or tour led by naturalist)	(3)	(2)
(no preference between trail with self-guiding leaflet or tour led by naturalist)	(1)	(1)

Table 2. (Continued)

	Number of parties responding	Percent
4. Were the self-guiding signs easy to read and understand?		
Yes	123	99
No	1	1
5. Was the amount of information on the signs sufficient to explain the various natural features?		
Yes	120	97
No	4	3
6. If pictures or maps were used on the signs, were they useful in explaining or helping you see a particular trail feature?		
Yes	121	98
No	3	2
7. Which loop of the trail did you enjoy most?		
Hiker's Loop	22	18
Mound Loop	56	45
Marsh Loop	35	28
no preference	5	4
(between any loops)	(3)	(2)
(between Mound Loop and Marsh Loop)	(2)	(2)
Undetermined	6	5
(The following is a breakdown of the reasons given for each trail loop taken.)		
Hiker's Loop:		
no reason	5	23
"like to hike"	11	50
longer trail good for groups	2	9
other	4	18

Table 2. (Continued)

	Number of parties responding	Percent
Mound Loop:		
no reason	17	30
shorter, or easier	24	43
interesting Indian mounds	5	9
only loop ever taken	8	14
other	2	4
Marsh Loop:		
no reason	16	45
interesting marsh boardwalk	8	23
good length	7	20
only loop ever taken	2	6
other	2	6
No preferences:		
all loops taken, all interesting	3	60
either Mound Loop or Marsh Loop, because of shorter length	2	40
Undetermined (did not complete walk)	6	
8. What was your primary reason for visiting this nature trail?		
(a) rest or recreation stop on a long trip or vacation	4	3
(b) enjoyment of outdoor scenic beauty	53	43
(c) nature photography	2	2
(d) nature education for children	5	4
(e) nature education for adults	3	2
(f) nature education for children and adults	4	3
(g) combination of (b) and (c)	3	2
(h) combination of (b) and (d)	38	30
(i) combination of (b) and (e)	7	6
(j) combination of (b) and (f)	1	1
(k) combination of (c) and (f)	2	2
(l) combination of (d) and (f)	1	1
(m) other	1	1

Table 2. (Continued)

	Number of parties responding	Percent
9. If a nature trail were nearer your home, how often would you visit it?		
once or twice	10	8
occasionally	67	54
often	47	38
10. Do you think that the natural features and wildlife of the prairie (or grassland) and marshes in eastern South Dakota might be interesting enough to establish trails in those areas?		
Yes	113	91
No	6	5
No opinion	5	4
11. Do you have any suggestions you feel might improve this type of nature trail?		
-more signs, overall	7	
-more detailed (or expletive) signs	2	
-seasonal (changing) signs	1	
-two levels of interpretation (adults and children)	1	
-more interpretation of Indian mounds and excavations	11	
-replace worn signs	2	
-more observation platforms	2	
-telescope on observation platform	1	
-introductor sign, map, or information at start of trail	6	
-tree and plant identification along trail (by leaflet or sign)	7	
-check list of local birds, trees, plants, mammals, etc.	2	
-poison ivy warnings	4	
-source of drinking water	3	
-picnic area	1	
-more rest areas (benches) along trail	1	

Table 2. (Continued)

	Number of parties responding	Percent
-trail to edge of lake	1	
-no hunting in trail areas	3	
-insect control	2	
-weed control along paths	1	
-leave mound area mostly undisturbed	1	

Only 3 percent of the parties were school or organized group visits. Since this survey was made primarily on weekends and holidays, there may have been a bias against school groups.

Overall, the distance traveled before visiting the trail ranged from as near as 6 miles on local visits to as far as 1300 miles on vacation visits. No actual distances were required for the interview; they were approximated from information given by the parties.

Trail length.--Of particular interest to this study were visitor preferences concerning interpretive methods and associated facilities at Mahnomen Wildlife Trail. Inferences might be drawn and applied to proposed interpretive-recreational areas on prairie wetlands.

Ninety-three percent of the visiting parties believed the trail was sufficiently long for persons to see the natural features of the area. There was undoubtedly a bias since the visitor could choose the length of trail he wished to walk, before starting his hike. Only 5 percent of the visiting parties thought the trails should be longer, and 2 percent believed they should be shorter. The U. S. Department of Agriculture, Forest Service (1964), suggests that the self-guiding trail should be kept short, about 1/2 mile, unless topography, such as a small lake or marsh, dictate otherwise.

Interpretive devices.--When asked if they enjoyed using the self-guiding signs, all of the parties responded affirmatively.

This question was followed with one concerning the type of nature walk the visitor preferred. Seventy-nine percent preferred the trail with self-guiding signs, 5 percent said they preferred a

self-guiding leaflet or booklet, 7 percent indicated preference for a walk led by a naturalist, and 9 percent listed other methods or a combination of methods.

When questioned as to whether or not the trail signs were easy to read and understand, 99 percent responded with a "yes" answer. Ninety-seven percent thought that information given on signs was sufficient to explain the various wildlife features they saw.

The visitor was then asked if he thought that pictures or maps on the signs were helpful in pointing out or explaining a particular trail feature. Ninety-eight percent of the parties believed such devices were useful.

Since these questions were asked of people actually using a self-guiding nature trail, it might be expected that such a captive audience would respond with a bias against other interpretive methods. However, visitors were assumed to be interested in the outdoors and had, at some time, been exposed to other interpretive methods, such as the naturalist-led walk. This assumption was made after informal conversations with many of the visitors. Thus, it is believed other methods were not highly discriminated against.

Trail themes.--Visitors were asked which loop of the trail they enjoyed most. It was found that 46 percent preferred the Marsh Loop, and 18 percent indicated the Hiker's Loop as their favorite. A small number, 4 percent, had no preference for any one loop, and 5 percent were "undetermined" inasmuch as they did not complete a loop.

Each party was asked why it most enjoyed the loop it had selected. Of those indicating the Mounds Loop as their preference, 43 percent stated it was because this loop was shorter or easier to walk, 14 percent said it was the only loop ever taken, and 9 percent liked the loop because of the interesting Indian mounds and excavations. Four percent gave other reasons, and 30 percent had no particular reason for their choice.

Parties listing the Marsh Loop as most enjoyable responded with the following reasons: 23 percent because of the interesting marsh boardwalk, 20 percent because the trail was a reasonable length, 6 percent because it was the only loop ever taken, and 6 percent for other reasons. In this instance, 46 percent gave no reasons.

Of those parties indicating the Hiker's Loop as most enjoyable, 50 percent said they "like to hike," 9 percent thought the longer length was the right length for larger groups, and 18 percent gave other reasons. Twenty-three percent gave no reason for their choice.

A small percentage indicated no preference for one loop over another. Of these, three parties said they had taken all loops and found them all interesting. Two parties stated they would prefer either the Mounds or Marsh Loops because they were shorter trails.

Gebler (1955) found this theme approach to nature interpretation generated interest among visitors in a similar study in Yellowstone National Park.

Reasons for trail visit.--Each party was asked the primary reason for visiting the wildlife trail. For this question, six answers were provided by the interviewer, and the visitor was asked to select from this list.

In answering, 43 percent of the parties came to enjoy the scenery or beauty of the area. Four percent came for their children's nature education, 3 percent for their own education as well as their children's, and 3 percent for a rest or recreation stop on a long trip or vacation. Two percent indicated an interest in nature photography, and 2 percent came for their own nature education alone. The remaining 47 percent came for a combination of reasons (Table 2). Of these, 31 percent visited the trail to combine enjoyment of the natural scenic beauty and their children's nature education.

Potential for trail use.--When asked how often they might visit a nature trail if it were nearer their home, 54 percent indicated they would visit it "occasionally," 38 percent said "often," and 8 percent said they would probably visit it "only once or twice."

Interpretation of prairie wetlands.--A question was included to determine the visitors' ideas about nature in the prairie. Each party was asked if he thought the natural features of prairie and marshes in eastern South Dakota might be interesting enough to warrant the establishment of trails in those areas.

A large number of visitors stated they knew little of the prairie, but were sure it must be interesting. Final analysis revealed 91 percent of the parties indicated a "yes" answer, 5 percent said "no," and 4 percent had no opinion.

One party, visiting from Kansas, thought the prairie and marshes were extremely interesting and indicated hopes for an eventual prairie national park somewhere in the Midwest.

Suggestions made by trail users.--For the final question, every party was asked to offer suggestions which might improve this or a similar nature trail. Of the 124 parties interviewed, 59 offered suggestions (Table 1). Eleven parties wished to see more interpretation of Indian mounds and excavations, seven thought there should be more interpretive signs used, and seven desired identification of trees and plants by leaflets or signs.

The large map of the trails was erected midway through the study. Prior to this, several parties indicated a need for such a map as well as other trail information.

CONCLUSIONS

There has been a considerable gap in interpretation of natural wonders associated with the plentiful prairie wetlands left by glaciers in the north-central United States. Utilizing a systematic evaluation for choosing areas of high potential, certain prairie marshes might be selected for developing interpretive-recreational areas, specifically, establishing self-guiding nature trails.

A number of trends resulted when data collected in a visitor-use survey at an existing interpretive trail were analyzed. These trends should be taken into consideration when planning interpretive facilities on prairie wetland areas. A majority of the users will be local residents, i.e., within approximately one hour's driving time of the wetland. This implies selection of sites near towns or in regions of relatively high population, which would also make the areas accessible to nearby schools.

About as many children as adults will visit the area. Therefore, interpretation should be of interest to both children and adults.

A trail of 1 1/2 miles or less in length will be preferred by most visitors. The theme approach to trails, as demonstrated by loop themes of the trail in this study, apparently generates some interest among visitors.

The self-guiding sign is the interpretive method best accepted by those using the trail. Pictures or maps used in conjunction with sign texts are deemed important devices to the visitor.

Historical features of the area create visitor enthusiasm and interest, but these require thorough interpretation. Likewise, a device, such as a floating marsh boardwalk, which allows the visitor to examine certain natural features he would not otherwise see also stimulates interest.

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