PARTCH WOODS
SCIENTIFIC AND NATURAL AREA

MANAGEMENT PLAN
AND
RESOURCE INVENTORY

The Scientific and Natural Areas Program...

Protecting and Managing the Best of Minnesota's Natural World

PARTCH WOODS
SCIENTIFIC AND NATURAL AREA

MANAGEMENT PLAN
AND
RESOURCE INVENTORY

A Public Use Unit

Permitted Uses Include:

.Research - Programs conducted by qualified scientists and college graduate and post-graduate students (permit required)

.Education - Primary, secondary and college programs

.Public Use - Interpretive programs and nature observation

Division of Fish and Wildlife
Minnesota Department of Natural Resources

PARTCH WOODS

MANAGEMENT PLAN

DECEMBER, 1979

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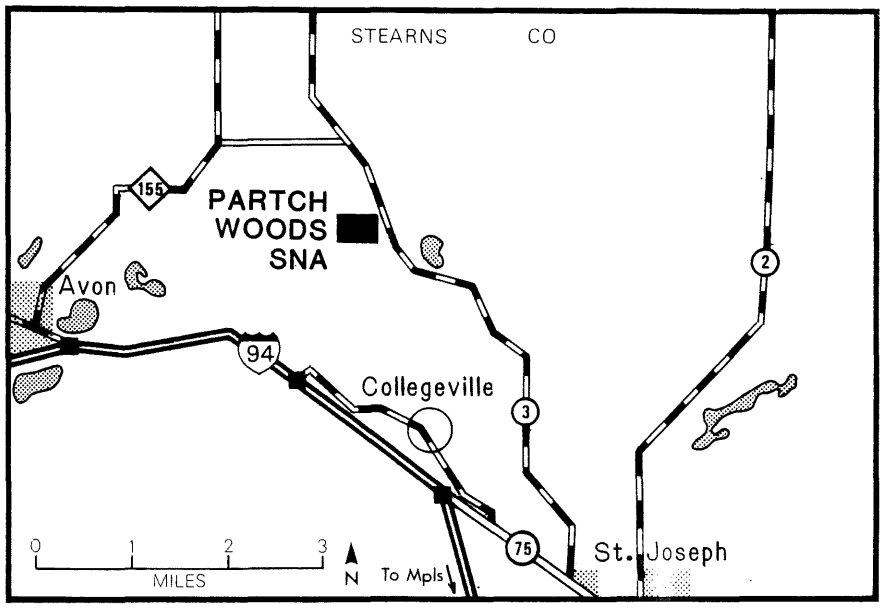
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INTRODUCTION

Partch Woods was acquired by the Nature Conservancy (TNC) because knowledgeable individuals reported that the maple-basswood forest and its flora were important elements of Minnesota's natural heritage. The 1977 inventory has documented the occurrence of these elements and provided the basis for developing a site management plan.

The purpose of this management plan is to describe the specific actions which will be taken in managing Partch Woods. Section I describes the general considerations which affect the management of the tract. First, TNC management guidelines are outlined. Then the Minnesota Scientific & Natural Area (SNA) Program, its policies, rules and regulations are described. State laws affecting management are also briefly outlined. Section II describes the site-specific detailed actions to be implemented on Partch Woods. Finally, guidelines for modifying and reviewing the plan are noted in Section III.

MANAGEMENT CONSIDERATIONS

Introduction

Presently Partch Woods is being managed by TNC staff and volunters. TNC's strategy for Partch Woods is to explore mechanisms by which public agencies and institutions can be included in management implementation. Our goal here is not to relinquish active TNC stewardship, but rather to develop a cooperative alliance consisting of TNC, local citizens, and one or more public agencies or institutions. This combination, we believe, provides maximum assurance that proper stewardship will be provided in perpetutity for Partch Woods.

The Scientific & Natural Area (SNA) Program of the Minnesota Department of Natural Resources (DNR) was created by legislative statute in 1969. Its goal is to:

> Preserve and perpetutate the ecological diversity of Minnesota's natural heritage, including landforms, fossil remains, plant and animal communities, rare and endangered species, or other biotic features and geological formations for the scientific study and public edification as components of a healthy environment.
>
> (DNR Policy on Scientific & Natural Areas, July, 1979)

(The SNA Program is described in detail beginning on page 7.)

Since the SNA objectives and philosophy so closely parallel those of TNC it is appropriate to involve the SNA Program as one member of the cooperative alliance in the stewardship of Partch Woods. In order to enable state and federal funds to be expended for evaluating and managing Partch Woods a ten year renewable lease was signed by TNC on 25 July 1979 and by the DNR on 9 August 1979. This lease calls for the Minnesota Natural Heritage Program to review the tract for possible designation as a SNA. If Partch Woods is not designated

a SNA within two years of the signing of the lease either party may terminate the agreement. If Partch Woods is designated a SNA it will be managed in accordance with SNA policies, rules & regulations. The lease also specifies procedures for the review and approval of a management plan as well as other aspects of administering and operating the property.

Presently the Minnesota Natural Heritage Program is in the preliminary stages of reviewing Partch Woods as a possible SNA. A decision will not be made on the site until at least June, 1980. Since it is not presently known whether Partch Woods will be designated a SNA, and since implementation concerns are dependent on this decision, this plan does not examine the means of implementing specific management actions. Until such time as public resources are made available management actions will be undertaken by TNC staff and volunters, and funded out of the Minnesota Chapter's preserve management account. All annual reports, survey data, research proposals, registration sheets, informational requests, etc., should be directed to:

Mr. Mark Heitlinger
Minnesota Coordinator of Preserve Management
The Nature Conservancy
328 East Hennepin Avenue
Minneapolis, MN 55414 (tel.:612-379-2134)

If Partch Woods is designated a SNA implementation responsibilities will be specified in a letter of agreement between TNC and the DNR, as called for in the lease. If the preserve is not designated as a SNA then other disposition and management options must be explored by TNC.

The Nature Conservancy's Management Guidelines

TNC's management guidelines govern what management actions will be implemented on Partch Woods. The two primary TNC stewardship objectives are as follows:

> The primary objective is to maintain areas so that they sustain species, communities, and natural features that make significant contributions to the preservation of natural diversity. The secondary objective is to determine and promote land uses compatible with the preservation of natural diversity on the preserve, in order to foster local support for individual preserves and recognition by the general public of the values of natural diversity preservation.
>
> (Stewardship guide for preserve committees, 1978)

The primary or ecological objective is closely tied to determining which of the preserve's resources are most significant for preservation. The Minnesota Natural Heritage Program will play a major role in identifying which elements of the preserve are most significant. This assessment in turn determines how the preserve will be managed. For example, if an endangered species is the most significant element on the tract and that species requires a successional plant community, then management should be directed at perpetuating this successional stage in order to preserve the endangered species. If, on the other hand, the most significant element on the tract is a climax community then a different management program is necessary.

Management may be directed at species, communities, natural features, etc. In January, 1978 the Minnesota Chapter of TNC developed a Manual for stewardship of Nature Conservancy lands in Minnesota. The following guidelines are taken from this document.

If the occurrence of one or more species are determined to be significant on a preserve TNC will:

1. MAINTAIN POPULATION LEVELS SO THAT THE SPECIES' CHANCES OF LONG TERM SURVIVAL ON THE TRACT REMAIN STABLE OR ARE IMPROVED.

Management to increase the population of any species should be integrated with perpetuating other native species and maintaining the tract as a diverse and naturally functioning system. There may be important ecological

factors regulating the population size of significant species and it may not be desirable in all cases to attempt to increase populations.

2. MANAGEMENT OF SPECIES' POPULATIONS WILL BE ACCOMPLISHED PRINCIPALLY THROUGH MANAGEMENT OF THE SPECIES' NATURAL HABITAT AND THROUGH PROTECTION OF THE SPECIES FROM VANDALISM, POACHING AND SIMILAR THREATS.

Thus managers generally will not use artificial means, such as direct control of natural predation, manipulation of food supply through food plots, or improvement of nesting habitat through plantings or artificial shelters to manage populations. Exceptions to this guideline should only be made in certain circumstances when special actions are necessary for the survival of a species or to redress an imbalance due to a factor such as predator extinction.

Management of plant communities should also be guided by an assessment of the preserve's communities. Where management is directed toward plant communities TNC will:

3. MAINTAIN OR RESTORE SELECTED PLANT COMMUNITIES AS NEAR AS POSSIBLE TO THE CONDITIONS THEY WOULD BE IN TODAY HAD NATURAL ECOLOGICAL PROCESSES NOT BEEN DISRUPTED. THIS GUIDELINE WILL BE ACHIEVED, TO THE EXTENT FEASIBLE, BY:
   A) PERPETUATING AND AS NECESSARY RE-ESTABLISHING NATURAL ECOLOGICAL PROCESSES; AND
   B) MINIMIZING IMPACTS OF CHEMICAL, MECHANICAL AND SIMILAR ARTIFICIAL PROCESSES ASSOCIATED WITH HUMAN INFLUENCES.

Some preserves will be protected because they contain significant geological, hydrological or other natual features. The same Heritage Program methodology used to evaluate species and plant communities should be used to assess the importance of these features. TNC will:

4. MAINTAIN NATURAL FEATURES IN PRISTINE CONDITION AND PROTECT THEM FROM UNNATURAL CORROSION AND DETERIORATION. THIS WILL BE ACCOMPLISHED PRIMARILY THROUGH REGULATING THE LEVELS AND TYPES OF HUMAN USE AND IMPACTS THAT ACCELERATE CORROSION AND DETERIORATION.

In special instances steps may be taken to prevent or diminish even natural

processes of deterioration in order to perpetuate significant natural features and other natural elements.

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The secondary or social stewardship objective of TNC is to foster local support for preserves and recognition by the general public of the value of natural diversity preservation. The future preservation of natural areas depends upon a constituency of users and supporters. TNC should foster the development of such a constituency by encouraging the appropriate use of preserves by educators, students, researchers and other members of the general public. The management plan should identify appropriate types and levels of use, and specify programs to facilitate such use.

To achieve the above stewardship objective TNC will:

5. INVOLVE LOCAL RESIDENTS, USERS, AND OTHER INTERESTED MEMBERS OF THE PUBLIC IN DISCUSSIONS ABOUT STEWARDSHIP PLANNING AND IMPLEMENTATION.

6. PROVIDE INFORMATION ABOUT THE PURPOSE AND NATURAL QUALITIES OF THE PRESERVE TO THE LOCAL COMMUNITIES AND PRESERVE USERS.

7. KEEP THE PRESERVE AS FREE FROM HAZARDS TO USERS AS POSSIBLE.

8. CONDUCT STEWARDSHIP ACTIVITIES IN A WAY THAT MINIMIZES UNNECESSARY ANNOYANCES AND HAZARDS TO RESIDENTS NEAR THE PRESERVE.

9. UTILIZE PRESERVE DESIGN, SUCH AS THE PLACEMENT OF TRAILS, PARKING AREAS AND SIGNS, TO BOTH OPTIMIZE ACCESSIBILITY OF THE PRESERVE AND MINIMIZE UNDESIRABLE HUMAN IMPACTS TO THE EXTENT THAT SUCH DESIGN MEASURES DO NOT CONFLICT WITH OTHER PRESERVE OBJECTIVES.

10. PROMOTE APPROPRIATE RESEARCH AND EDUCATIONAL USE OF THE PRESERVE.

The two major stewardship goals--ecological and social--may at times conflict with each other. People crush vegetation, erode and compact soil, alter the behavior of wildlife and transport onto preserves the seeds of unwanted plants that stick to shoes and clothing. It is the Nature Conservancy's

position that:

11. ECOLOGICAL CONSIDERATIONS SHOULD BE WEIGHED MORE HEAVILY THAN HUMAN CONSIDERATIONS WHEN THERE IS A THREAT THAT SIGNIFICANT NATURAL ELEMENTS ON A PRESERVE WILL BE ALTERED OR SIGNIFICANTLY DAMAGED.

The Minnesota Scientific & Natural Area (SNA) Program

Since the SNA Program may also be involved in the stewardship of Partch Woods a description of the SNA Program management policies, rules & regulations, and pertinent legislation is included here. If and when Partch Woods is designated a SNA it will be managed in accordance with these statutes, policies, rules and regulations.

The SNA Program is located in the Minnesota Department of Natural Resource's (DNR) Division of Parks. The Scientific & Natural Areas Act (M.S.A. 84.033) of 1969 created the program. It authorized the Commissioner of the DNR to acquire, designate and maintain SNAs, and to adopt pertinent rules and regulations governing the use of the areas.

The DNR issued rules and regulations governing the SNAs in 1973 (Minnesota Reg. NR 300-303). The rules & regulations, still in effect, cover permitted and restricted uses of SNAs, provide for environmental protection, prohibit certain uses and acts, and establish legal penalties for violations. The rules & regulations also state that the Commissioner of the DNR can restrict: 1) travel within the unit; 2) the hours of visitation; and 3) the number of visitors within the area at any given time.

In 1975 the Scientific and Natural Areas Act was ammended by the Outdoor Recreation Act (ORA: M.S.A. 86A.05). This statute further defined and more adequately funded the program. It included SNAs within the Minnesota Outdoor Recreation System, defined the purpose of SNAs, delineated resource and site qualifications, provided for administration of the units, and

classified SNAs into one of three "use designations": Research, Education and Public Use. The law states that only scientific, educational or public uses which do not impair or threaten the preservation objectives are to be allowed. Physical development is limited to facilities absolutely necessary for protection, research and education projects, and when appropriate for interpretive services. Finally, the ORA requires plans be drawn up for each SNA. No development funds can be spent by the DNR until these plans have been approved.

In order to be designated as a SNA a site must: 1) contain elements of "exceptional scientific & educational value," and 2) "be large enough to preserve their inherent natural values and permit effective research or educational functions." The SNA designation process begins when an individual or group nominates an area. The SNA staff notifies the DNR Commissioner's Advisory Committee (CAC) on SNAs and the Minnesota Natural Heritage Program of all new nominations. The SNA staff then is responsible for conducting a field survey of the site to determine the site's qualities, vulnerability, extent of man-made disturbances and management practices which may be needed. The results of this field survey are forwarded to the Heritage Program which then evaluates the significance of the site's elements. Using the field survey data and the Heritage Program evaluation CAC assesses the site and sends a recommendation to the SNA Program. Based on the CAC recommendation, the priorities for protection as established by the Heritage Program, and on other considerations, such as the opportunity to acquire the area, the SNA Program sends the proposal to the Division of Parks for approval. Finally, the proposal is passed on to the DNR Commissioner. If the DNR Commissioner approves the site the land is acquired either by fee simple purchase, lease

(as is the case with Partch Woods), donation or easements. Once the DNR Commissioner determines sufficent land rights have been acquired to administer the area as a SNA it is formally designated. The formal designation includes the classification of the site as either a Research, Educational or Public Use unit.

If and when Partch Woods is designated a SNA the Outdoor Recreation Act requires that a master plan for the area be completed and approved. The SNA Program is responsible for completing this plan. After the SNA draft plan is completed the CAC and DNR review and approve it. An announcement is then made to the public and other state agencies regarding the existence of the plan. Interested persons and agencies are invited to review and comment on the plan within thirty days of the announcement. Comments received by the DNR are reviewed and appropriate changes are made in the plan. Finally, the revised plan is submitted to the State Planning Agency for review. After the DNR reviews this agency's recommendations, and makes the necessary changes, the plan is offically approved.

In July 1979 the DNR issued a policy statement on SNAs. These policies will affect the management of Partch Woods if and when it is designated. The policies are divided into Designation, Resource Management and Human Use Management. To ensure the preservation of the SNA's elements of natural diversity it is the DNR's policy to:

1. IDENTIFY AND CATALOG THE NATURAL FEATURES OF THE AREA.
2. ENSURE THAT RESOURCE MANAGEMENT IS DIRECTED TOWARD PRESERVATION AND MAINTENANCE OF ALL SIGNIFICANT ELEMENTS OF THE AREA.
3. MANAGE THE AREA IN SO FAR AS POSSIBLE, TO PERPETUATE OR ESTABLISH NATURAL PROCESSES AND LIMIT THE EFFECTS OF HUMAN ACTIVITIES.
4. PROMOTE WISE STEWARDSHIP WITH USERS, LOCAL RESIDENTS AND SPECIAL

INTEREST GROUPS.

To fulfill these general policies the DNR will:

5. MONITOR AND EVALUATE SNA MANAGEMENT PERIODICALLY TO DETERMINE IF MANAGEMENT OBJECTIVES ARE BEING ACHIEVED.

6. USE MANAGEMENT METHOD(S) CONSIDERED MOST NATURAL AND APPROPRIATE TO THE TOTAL ENVIRONMENT OF THE AREA AND:
   A. NOT USE COST ALONE TO DICTATE SELECTION OF THE APPROPRIATE MANAGEMENT METHODS;
   B. DESIGN MANAGEMENT PLANS TO ADDRESS THE ECOLOGICAL INTEGRITY OF THE AREA TO PREVENT MISMANAGEMENT;
   C. REMOVE EXISTING DEVELOPMENTS OR UNNATURAL OBJECTS UNLESS THEY ARE UNOBTRUSIVE AND NOT DETRIMENTAL TO THE PURPOSES FOR WHICH THE AREA WAS DESIGNATED OR OF HISTORIC VALUE.

7. PROHIBIT THE FOLLOWING:
   A. CUTTING OF GRASS, BRUSH, OR OTHER VEGETATION, THINNING TREES, REMOVAL OF DEAD WOOD AND WINDFALLS, OPENING OF SCENIC VISTAS, OR PLANTING EXCEPT AS PROVIDED FOR IN THE MANAGEMENT PLAN;
   B. INTRUSIONS OF DEVELOPMENT ON, THROUGH OR OVER SNAs UNLESS ESSENTIAL TO THE MANAGEMENT OF THE UNIT;
   C. MINERAL EXTRACTION, PEAT HARVESTING AND WATER INUNDATION OR APPROPRIATION;
   D. COLLECTION OF PLANT, ANIMAL, HISTORIC OR GEOLOGICAL SPECIMENS (EXCEPT BY PERMIT) OR ANY CONSUMPTIVE USE OF NATURAL RESOURCES;
   E. INTRODUCTION OF PLANT, ANIMAL OR OTHER OBJECTS, INCLUDING LIVE SEEDS OR DISEASE ORGANISMS, UNLESS EXPRESSLY PROVIDED FOR IN THE MANAGEMENT PLAN.

8. PROVIDE THE FOLLOWING:
   A. SPECIAL MANAGEMENT TO TRANSIENT SPECIES ONLY WHEN THERE IS A WELL DEFINED NEED;
   B. SPECIAL MANAGEMENT FOR BALD EAGLE NESTS AND COLONIAL WATER BIRD NESTING SITES WHERE APPROPRIATE;
   C. REVIEW OF DNR PERMITS AND ACTIONS TO MINIMIZE ADVERSE EFFECTS ON A DESIGNATED SNA.

9. INVOLVE USERS, LOCAL RESIDENTS, AND SPECIAL INTEREST GROUPS IN THE MANAGEMENT OF THE SNA AND ENFORCEMENT OF RULES.

10. ESTABLISH A WORKING RELATIONSHIP WITH ADJACENT LANDOWNERS SO AS TO MINIMIZE OR ELIMINATE THOSE LAND USE PRACTICES HAVING AN ADVERSE IMPACT ON THE SNA.

To ensure the preservation of SNA resources and provide for use of the area it is the DNR's policy to:

11. LIMIT HUMAN USE ON SNAs TO THE AMOUNT THE RESOURCE CAN TOLERATE WITHOUT DAMAGE TO SPECIAL FEATURES.

12. PROVIDE FOR THE INTERPRETATION OF THE SPECIAL FEATURES AND THEIR MANAGEMENT.

13. SEEK INPUT FROM USERS, LOCAL RESIDENTS AND SPECIAL INTEREST GROUPS IN DECISIONS REGARDING MOST SUITABLE USE(S).

14. REQUIRE USERS ENGAGED IN SCIENTIFIC STUDY TO MAKE INFORMATION OBTAINED ON THE SNA AVAILABLE TO DNR AND ENCOURAGE USERS TO MAKE THEIR STUDIES AVAILABLE TO THE SCIENTIFIC COMMUNITY THROUGH REPORTS OR PUBLISHED ARTICLES.

To fulfill these general policies the DNR will:

15. ENCOURAGE:
    A. ACTIVITIES WHICH CAN OCCUR EQUALLY WELL ON LESS VULNERABLE OUTDOOR AREAS TO BE CONDUCTED ELSEWHERE;
    B. SCIENTIFIC STUDIES, PHOTOGRAPHY, AND KEEPING OF PHENOLOGICAL RECORDS AND FAUNAL AND FLORAL LISTS FOR LONG TERM RESEARCH AND EDUCATIONAL BENEFITS;
    C. APPROPRIATE USERS AND PUBLIC SUPPORT RATHER THAN UNRESTRICTED PUBLIC USE.

16. PROHIBIT THE FOLLOWING ACTIVITIES UNLESS NECESSARY FOR MANAGEMENT PURPOSES OR SPECIFICALLY AUTHORIZED BY THE MANAGEMENT PLAN: COLLECTING PLANTS & ANIMALS, HUNTING, FISHING, CAMPING, PICNICKING, HORSEBACK RIDING, MOTORIZED VEHICLE USE WITH THE EXCEPTION OF PARKING FACILITIES AND SIMILAR ACTIVITIES.

17. ASSURE STRUCTURES, TRAILS AND SIGNS ARE AS SPECIFIED IN THE MANAGEMENT PLAN AND IN KEEPING WITH THE NATURAL SURROUNDINGS AND PRESENT ONLY SO FAR AS REQUIRED FOR RESOURCE PROTECTION AND PROVISION OF BASIC USER NEEDS.

18. ADAPT INTERPRETIVE TECHNIQUES AND MATERIALS TO THE USER.

19. LIMIT OR EXCLUDE USE FROM AN AREA FOR AN APPROPRIATE PERIOD OF TIME WHEN IMPORTANT NATURAL FEATURES ARE THREATENED AS A RESULT OF SUCH USE.

20. CLEARLY POST THE PROCESS FOR OBTAINING A VISITOR USE PERMIT WHEN REQUIRED, AT THE ENTRANCE TO THE SNA.

21. NOTIFY ADJACENT LANDOWNERS AND INTERESTED PARTIES PRIOR TO IMPLEMENTING MAJOR MANAGEMENT ACTIONS.

22. ERECT BOUNDARY SIGNS AS SPECIFIED IN THE MANAGEMENT PLAN TO DISCOURAGE ENCROACHMENT AND TRESPASS ONTO THE SNA AND ONTO ADJACENT PROPERTY BY SNA USERS.

23. REQUIRE A "PACK OUT WHAT YOU BRING IN" LITTER PHILOSOPHY AND ENFORCE LITTER REGULATIONS.

24. FENCE ONLY WHEN NECESSARY TO CORRECT PERSISTENT ENCROACHMENT OR TRESPASS PROBLEMS TO THE SNA OR ADJACENT PROPERTY.

25. REGULATE USE BY EMPLOYING, SINGLY OR IN COMBINATION, METHODS THAT INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING:
    A. NO ACCESS RESTRICTIONS;
    B. ACCESS BY PERMIT ONLY;
    C. ACCESS ON DESIGNATED TRAILS ONLY;
    D. TEMPORAL OR SPATIAL ZONING.

26. REQUIRE:
    A. REVIEW OF ALL RESEARCH PROPOSALS FOR THE SNA WITH EMPHASIS ON THE PROPOSED RESEARCH METHODOLOGY;
    B. IF NECESSARY, BONDING OF RESEARCHERS TO GUARANTEE CLEAN-UP FOLLOWING COMPLETION OF THE PROJECT(S).

Other Management Considerations

The Partch Woods' lease is another factor affecting management for at least the next two years (1979-1981). Under the provisions of the Nature Conservancy-DNR lease:

1. Management planning is a joint and cooperative responsibility of the DNR and the Nature Conservancy.

2. The DNR will notify TNC thirty days prior to any proposed change in the rules & regulations. The Conservancy will then notify the DNR within thirty days if the change is acceptable or not.

3. The DNR will not cause or permit to be caused any act constituting harm or destruction of the unit.

4. The DNR shall not apply or permit application of any chemicals, including herbicide and insecticide, unless it has been approved for in the management plan or unless written permission has been first obtained from the Conservancy.

5. If consistent with the management plan a permanent recognition sign shall be erected by the DNR on the unit.

6. Upon request the DNR shall provide TNC with an annual report on use management of the unit.

7. The Conservancy shall have access to the unit at any time.

8. TNC may, with the consent of the DNR, lease all or any portion

of the unit for purposes consistent with the management plan.

9. Both TNC and DNR can terminate the lease when there is a breach of the contract or if there is an irreconcilable difference regarding management of the tract.

Finally, several Minnesota statutes may affect the management of Partch Woods. They include:

1. Collecting and taking of wild animals:

   Under state law (M.S. 98.48) special permits are required from the DNR,Division of Fish & Wildlife,for the collection or taking of protected wild animals.

2. Endangered species:

   The Endangered Species Act (M.S.A.97.488) states that no endangered wild animal may be taken except under special circumstances. The DNR,Division of Fish & Wildlife, may undertake programs or promulgate rules and regulations which also affect the management of endangered or threatened species.

3. Conservation of certain flowers:

   Under state law (M.S. 17.23) no member of the Orchid or Trillium families, or any species of Lotus (Nelumbo lutea), Gentian (Gentiana), Arbutus (Epigaea repens) or Lily (Lilium) can be taken or gathered in any manner from public land without the permission of the Commissioner of Agriculture - and then only for scientific and herbarium purposes.

4. Control of noxious weeds:

   It is the duty of all landowners, according to state law (M.S. 18.181) to eradicate or otherwise destroy all noxious weeds. Section 18.315 also states that towns and cities may take steps to control noxious weeds on state lands within the territorial limits of the towns or cities provided that the managing agency fails to take action within fourteen days of receiving notice to cut or control the weeds. The following plants are considered noxious weeds statewide: Field Bindweed; Hemp; Poison Ivy; Leafy Spurge; Perennial Sowthistle; Bull Thistle; Canada Thistle; Musk Thistle; and Plumeless Thistle. In addition, in Stearns County Cockleburr, Wild Mustard, Sunflower and Velvet Leaf are all classified as noxious weeds.

II. MANAGEMENT ACTIONS FOR PARTCH WOODS

Introduction

This section describes the specific actions to be implemented on Partch Woods. The actions are grouped into three broad categories: resource management actions, use management actions and monitoring actions.[1] The resource management actions, in general, are primarily directed at preserving, perpetuating and restoring the tract's natural resources. Use management actions are directed primarily at the problems caused by, and needs of, the visitors. Monitoring actions are directed at insuring that both resource and use management actions are being effectively implemented, identifying unforeseen changes occurring on the site, and recording the results of management implementation. Under each management action there is a brief statement expanding on the action and the need for the action. In parentheses there is a numerical reference to the various TNC guidelines and SNA policies each action is designed to carry out. Since the actions usually implement more than one guideline or policy there are usually several numbers in the parentheses.

Within each of the resource, use and monitoring action categories the actions are subgrouped when possible according to function. The actions are not listed in order of priority.

Ownership modifications are of special concern to adjacent landowners, managing agencies, users and interested parties. Ownership modifications, including fee title purchase and conservation easements, which are taken to protect a resource, facilitate management, or enhance use are therefore listed

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1. It should be noted that these categories are artificial: user management actions affect resource management actions and vice versa. However, for the purposes of discussion it is convenient to follow this convention.

separately after the management actions have been outlined. In addition, modifications whose purpose is to protect "new" resource(s) outside the tract are noted here.

RESOURCE MANAGEMENT ACTIONS

Action 1. Erect a one-strand smooth fence on the east boundary of the tract,and a four-strand barbed wire fence on the east half of the south boundary;maintain all of the boundary fences (TNC guidelines 3,4, and 9; SNA policies 2,3,7(E),17 and 24).

This action is necessary to protect the forest from grazing by livestock, and to prevent people from inadvertently wandering into or out of the tract. (Depending on the disposition of Dr. Max Partch's land another fence may have to be erected on the west half of the south side;see Ownership Modifications) Although the erection of fences may be in conflict with SNA policy 24, TNC believes the action to be necessary. Steel studded T-posts, 6 or 6½ feet long and set at one rod intervals, should be used with wooden posts at corners and as braces for stretching. The adjoining land owners could be contacted to share in the expense of building the fences as per state law (Chapter 344: Partition Fences), or alternatively the managing agency could pay the cost. The fence on the east side of the tract may have to be moved if the tract's boundaries change (See Ownership Modifications). Fences should be inspected monthly to determine that no objects are leaning on the fences, posts are firm and wires are adequately strung.

Action 2. Consult with the adjacent landowner concerning the use of the southeast corner of the tract being used as a cow lane (TNC guidelines 3 and 4; SNA policies 2 and 3)

The cow lane constitutes encroachment and should not be permitted on the site. However, if the owner wishes to continue using the land he should be asked

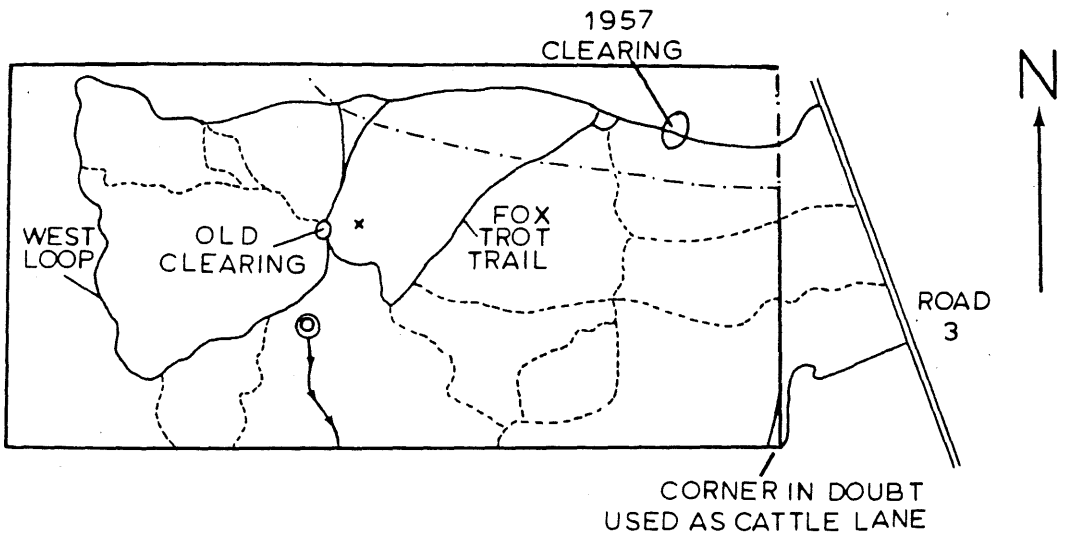
to trade his 2.2 acres to the south of the four acres between the woods and the road for this right (See Figure 1). The tract's boundaries would then have to be changed. If the owner does not agree to this trade he should be notified that TNC does not approve of this practice and intends to stop this unauthorized use of the land. If the owner nevertheless continues to use the land legal action should be taken.

Action 3. Develop and implement a wild fire suppression plan(TNC guidelines 4 and 8; SNA policies 3 and 4).

Local fire authorities, the fire chief of the nearest fire department and the DNR area forester, should be contacted annually about control methods to use should a wild fire start on or spread into the area. Fire control should be to prevent the spread of the fire outside of the tract's boundaries and be designed to minimize the damage produced by fire suppresion activities--the practicies used to suppress the fire may be more damaging than the fire to the natural resources. During extreme fire danger periods visitors and neighbors should be alerted to prevent man-caused fires. In the event a fire does occur natural fire breaks or backfires should be used to keep the fire from spreading outside of the tract. Heavy equipment and fire plows should not be used on the tract. In general, however, fire should not be a problem since climax deciduous woods do not produce fuels that create a high fire hazard.

Action 4. No effort should be made to control or remove diseased plants from the tract (TNC guidelines 3,4,and 11;SNA policies 3,6,and 7(A)).

Some of the techniques used to remove or control trees with Dutch Elm and Oak Wilt are more disruptive to the vegetative community than allowing the trees to die and rot. Therefore no action should be taken to control these diseases. There are no legal requirements for sanitation.



KEY

◎ Source of the seepage spring

× Pile of rocks

——— Present trails

------ Overgrown trails

—·—·— Approximate south boundary of 1896 logging

→→ Creek

SCALE: 8":1 MILE

Figure 1. General features of Partch Woods including trails and other landscape modifications.

Action 5. Periodically (i.e.,once per year) collect Ginseng seeds and store them under controlled conditions in a gene bank (TNC guidelines 1, 2, and 4; SNA policies 2 and 3).

If Ginseng becomes locally extinct this action insures a seed source to replant the area. The action is also necessary to plant a demonstration area. The number of seeds to be collected, storage conditions, and the collection time will depend on the local population, seed viability and other factors which research studies identify.

Action 6. Clip off all of the Ginseng plant tops in late summer (TNC guidelines 1,2,4 and 11; SNA policies 2,3,7(D) and 16).

This action is necessary to discourage collectors. In late summer or early fall Ginseng leaves turn color. It is during this time that the plant is most conspicuous and collectors are most active. Clipping the plants' tops will hopefully foil collecting efforts. Each summer, about August 15, after the plant has fruited, the plant tops should be clipped off and the seeds planted and stored.

Action 7. Collect additional information on the tract's bird population (SNA policy 1).

Actions 7-10 are necessary in order to identify significant and sensitive resources, obtain baseline data, and identify opportunities, problems, and trends for management. The data are also valuable for research purposes. The 1977 inventory did not adequately distinguish between which bird species pass through the area and which species actually reside in the forest. It also may have missed some birds due to a limited field season. This supplementary inventory will provide a more complete resource baseline for the tract. The inventory shall follow the methodology and procedures outlined in the 1979 SNA inventories.

Action 8. Inventory Partch Woods' amphibians and reptiles (SNA policy 1).

The 1977 inventory did not examine Partch Woods' amphibians and reptiles. Consequently no information exists on these elements. The information will result in a more complete resource baseline for this tract. The inventory should follow the methods followed in the 1979 SNA inventories.

Action 9. Survey Partch Woods' water quality and hydrology (SNA policy 1). Presently there is no information on the site's water quality and hydrology. The depth of the groundwater can be measured using the method described by Turnock & Lawrence (1953).[1] Water quality data can be obtained using the Hach Chemical Company's DR-EL/1 and DR-EL/1a Environmental Laboratory Water Test Kits, or similar equipment. It would also be desirable to test the stream periodically for pesticides. Data obtained from this research will provide a more complete resource baseline and will alert managers to possible pollution problems.

Action 10. Collect additional information on Partch Woods' flora (SNA policy 1). This supplementary inventory will focus on those elements which the 1977 inventory did not thoroughly survey: the non-vascular plants and the early spring vascular plants. Plants not recorded in the 1977 annotated plant list should be added to the list. The tract's spring phenology should also be recorded.

1. William Turnock and Donald B. Lawrence, Measurement of the level of the groundwater at the Cedar Creek Forest (Mimeo, 1953). For more information, contact the Sherburne National Wildlife Refuge where this method was also used.

USE MANAGEMENT ACTIONS

Action 11. Conduct litter cleanup operations (TNC guidelines 4 and 7; SNA policies 3,6(C) and 23).

Litter is unsightly and detrimental to the purposes the area serves. Presently there is not a litter problem in Partch Woods. However, users and managers will be encouraged to look for and dispose of litter properly.

Action 12. Post all boundaries of the tract and maintain the posts and signs (TNC guidelines 4,7,8 and 9; SNA policies 3,7,16 and 22).

The signs are necessary to prevent inadvertent encroachment by adjacent land owners, minimize unauthorized activities (e.g., hunting), and to identify the area's boundaries to managers. TNC posts and signs must meet the state of Minnesota legal requirements for posting. Two inch letters must be on the signs. Posts should be set no more than one-tenth mile apart; if visability is obscured they should be set closer together. At corners posts should be set so that the signs are nearly touching and at the same angle as the boundary lines. After the additions to Partch Woods have been made (See Ownership Modifications) posts will have to be moved to the new boundaries. If and when Partch Woods is designated a SNA offical SNA signs should be placed on all the boundaries; all TNC signs will be phased out. The signs and posts should be checked annually and repaired or replaced as necessary.

Action 13. Erect a main recognition sign at the entrance to the site (TNC guidelines 7,9 and 10; SNA policies 3,7,15 and 16).

An interim TNC recognition sign should be built on the northeast corner of the site. It should be visable from the highway, note the land is owned by the Nature Conservancy, and direct visitors to the registration box in the area. The sign should be of standard TNC design. If and when Partch Woods is designated a SNA this sign should be replaced by a SNA sign. As noted in the TNC-DNR lease

the SNA sign should state the land was acquired by the Nature Conservancy and managed as a SNA by the DNR. The sign should be annually touched up with Olympic wood stain, and the sign's letters should be repainted. Other maintenance actions should be taken as required.

Action 14. Develop and distribute a map showing the tract's boundaries, trails, and general features of interest (TNC guidelines 6,7,9 and 10; SNA policies 9,12,15(C) and 25(C)).

This map should be distributed to users, adjacent owners and interested parties until a Partch Woods' brochure is developed. The seepage spring will not be identified on the map to prevent damage to the resource.

Action 15. Develop and distribute a brochure on Partch Woods (TNC guidelines 4,6,7,9,and 10; SNA policies 3,4,7,9,12,15,16,23,25(C) and 26).

The brochure should include an accurate map of the area, a description of Partch Woods' history, natural features and significance, and a discussion of the impacts caused by people. It shall describe the DNR-TNC program (if appropriate), note conducted tours, promote a "pack out what you bring in" litter philosophy, locate and describe the Ginseng demonstration area, identify people to contact for more information about the site, and encourage visitors to register, provide comments and become involved in managing the area. Finally, the brochure should note TNC and/or SNA rules and regulations governing use, including the requirement that all researchers obtain a permit prior to conducting research on the area.

Action 16. Maintain the registration box and its supplies (TNC guidelines 4, 6,7,9, and 10; SNA policies 3,4,7,9,12,13,15,16,23,25(C) and 26).

A TNC registration box is already present on the site. It should be checked weekly during the spring, summer and fall to see that adequate copies of maps,

brochures, registration sheets and other relevent information notes (including notes on upcoming special events, the nearest DNR or volunter information source, the SNA rules & regulations (if appropriate) and/or TNC rules & regulations) are present. It is particularly important that registration sheets be collected and kept for analysis.

When the parking lot is completed (See Action 17) the registration box should be moved 200 feet from the parking area into the unit to insure that people registering have actually come into the area, and to reduce the possibility of vandalism.

The registration box should be annually touched up with Olympic wood stain. Other maintenance actions should be taken as required.

Action 17. Develop a parking plan for Partch Woods and implement it (TNC guidelines 9 and 10; SNA policies 12, 15(C) and 25).

Visitor access is an important management consideration. Presently the only place for parking near the tract is on the shoulder of a fairly busy narrow county highway. In order to provide safe access for users a parking area is needed. The parking area should be built near the road on the tract's east boundary. One possibility would be to build it on the land Dr. Partch is donating to TNC (See Ownership Modifications). However, culverts and ditch modifications will be required if the parking area is to be built here. The parking area should be kept small (i.e., space for six to ten cars) to keep costs down, minimize negative impacts on the tract, and discourage inappropriate public use. Gates or fencing may be needed to keep visitors from driving beyond the parking area and to control access onto the site. The DNR Bureau of Engineering should be consulted about the parking area design and surfacing.

Action 18. Construct and maintain a walk-around horse-proof structure on the entrance to the site (TNC guidelines 4,7 and 9; SNA policies 3 and 16).

This action is necessary to prevent horseback riding and off-road vehicles from riding along the site's trails. A post can be sunk in front of the two posts already present next to the registration box on the northeast corner. When the parking lot is completed another walk-around should be built at the new trailhead. The posts should be periodically checked to see that they are secure and in good condition. Maintenance actions should be taken as necessary.

Action 19. Develop a new trail to connect the parking lot with the main trail (TNC guidelines 4,9 and 10; SNA policies 3,12,15(C),17 and 25(C)).

This trail is necessary to provide controlled access into the area. It should be built simultaneously with the construction of the parking area. The trail should be nearly level, a maximum of four feet in width, unobtrusive, and minimize damage to the vegetation.

Action 20. Maintain the main trail on the northern part of the site, the west loop and the "fox trail" loop (and the parking area spur when it is completed. See Figure 1) (TNC guidelines 4,9, and 10; SNA policies 3,12,15(C),17 and 25(C)).

The trails should not exceed four feet in width. Fallen logs and brush on the trail shall be removed. Some hand clearing of vegetation may be necessary from time to time. The DNR regional trails coordinator should be consulted about what to do with the low wet areas on the northern and "fox" trails; the feasibility of filling these areas with gravel brought in by wheel barrow could be discussed at this meeting.

Action 21. Close all the trails on the site except for those noted above (TNC guidelines 4,9 and 11; SNA policies 3,11,17 and 25(C)).

A winter color-IR aerial photograph should be taken to locate all of the unauthorized trails. Most of the trails are now overgrown. Trails which are

visable should have barriers of local brush or logs to prevent use and allow re-vegetation to occur. Particular care must be taken to keep undirected and recreational users away from the seepage spring.

Action 22. Develop a Ginseng demonstration area adjacent to the main trail in the north central part of the site (TNC guidelines 1,2,6,9 and 10; SNA policies 3,4,7(D),9,12,15(B) and 16).

Ginseng seeds or seedlings should be artifically planted in a demonstration area which researchers indicate is appropriate.[1] The area will then be publicized in the brochure, by news release, and by the volunter manager, field walk leaders and managers. This unconventional action is being taken because secrecy has failed to adequately protect the plant elsewhere. The demonstration area will educate the public about this plant and its significance, show that it is possible to obtain the seed and grow the plants without having to destroy a natural area's plant population, and make the public aware of its responsibility in managing the area. Hopefully the demonstration area will increase the likelihood of the plant's survival. If the demonstration area is destroyed then managers will have to try other techniques to protect the plant. (The Ginseng will be re-introduced from the seed bank;see Action 5.)

Action 23. Conduct field walks in Partch Woods (TNC guidelines 5,6 and 10; SNA policies 4,12,13 and 15(C)).

This action will help acquaint and involve people in the area and its management. The number of conducted tours depends on time and money limitations, and the impact of the tours on the area. An effort should be made to lead trips in May, June, September and October which are ideal times for walks. News releases should be sent to the local media to publicize the walks and reporters should

1. One source of information on growing Ginseng is the U.S.Department of Agriculture, Science & Education Adminstration's pamphlet "Growing Ginseng", Farmer's Bulletin #2201, published in 1978.

be periodically asked to participate in the walks. In addition to educating visitors about Partch Woods' resources, guides should make a special effort to answer questions, inform visitors about the TNC-DNR program (if appropriate), obtain feedback on management, and make visitors feel like land stewards -- involved in managing the site and responsible for its well-being.

Action 24. Inform local middle and secondary schools about the site (TNC guidelines 6 and 10; SNA policies 4,9,12 and 15).

All schools in the vicinity of Partch Woods should at least know of the existence of the site and its educational potential for teaching such topics as native flora and fauna, soils and ecology. An effort should be made to annually meet with all teachers who express an interest and encourage them to use the site if appropriate (i.e., if such use cannot occur equally well on other less vulnerable areas). The sensitivity of the resource and teacher responsibility in caring for the land must be stressed in these meetings. Before a school group comes to the site teacher workshops should be held so that teachers are trained and well-informed about the area. When the class comes to the site scientists and managers should, if possible, also be present to assist the teachers.

Action 25. Consult with and inform regional higher education institutions and researchers on the site's resources and management (TNC guidelines 4,6 and 10; SNA policies 1,2,3,4,5,12,13,14,15 and 26).

St. Cloud State and St. John's Universities, the College of St. Benedict, and other scientific research groups or individuals who express a research interest in Partch Woods should be annually contacted. The purpose of these meetings is to inform researchers about the area (including TNC rules & regulations; all researchers should know that permits are required for all research conducted on the area) and to promote educational and research possibilities. Encouragement

should be given to investigating Ginseng propagation, an important management question. Data gathered from scientific studies are also important for monitoring the site. Thus all researchers conducting studies are to be consulted about their data and conclusions. Researchers should inform managers immediately of important natural changes and human impacts they discover. Researchers should furthermore be consulted and encouraged to offer input into managing the tract. Finally, research information should be accumulated, stored in a site file, and shared with interested researchers.

MONITORING | ACTIONS

Action 26. Recruit a local volunter manager preferably living within four miles of the tract (TNC guidelines 4,5,6,7,8, and 10; SNA policies 1,2,3,4, 5,7,9,10,13,15,16 and 21).

The volunter manager must have the time, interest and commitment to become intimately involved with the protection and management of the site. His/her job is primarily to: 1) maintain the registration box supplies and collect registration sheets; 2) periodically monitor the tract for signs of misuse or management problems and communicate them to managers (a "watchdog" function); 3) facilitate communications between managers, local residents and other parties; 4) aid managers when requested; and 5) orient new managers to the preserve and the local community.

Action 27. Periodic meetings will be held by managers for local residents (TNC guidelines 5,6,7,8, and 10; SNA policies 3,4,5,9,10,13 and 21).

Meetings will be publicized through news releases sent to the local media (A reporter(s) might also be asked to attend). They will be held at least once per year at a time and place convenient for local residents, perhaps in conjunction with a field trip or other activity; special circumstances, such as the implementation of a major management action, may warrant more than one meeting. These meetings can be used to enlist support for project work (e.g., monitoring), as a forum to discuss management actions, decisions and problems, or to encourage land owners to adopt various practicies. It is particularly important that adjacent land owners and frequent users be present at these meetings since their actions can have a large impact on the tract and vice versa. All comments regarding management should be recorded.

Action 28. Develop and implement a monitoring program for Partch Woods' vegetation (TNC guidelines 1,2,3 and 4; SNA policies 1,2,3,5 & 11).

A monitoring program should be developed to record changes occurring on the

tract, such as changes in plant succession or species diversity. Permanent releves and photopoints should be set up in the woods following the guidelines and procedures described in the 1979 SNA inventories. Dr. Max Partch should be consulted here about using his grid system in the monitoring program. Color IR aerial photographs should also be taken of the site once every five years.

Action 29. Periodically inspect the site (TNC guidelines 1,2,3,4,7 and 8; SNA policies 1,2,3,5,6(C),7,11,16 and 23).

The tract shall be thoroughly inspected at least once per month for human impacts (e.g., vandalism, trail widening, new trails, trampling of plants, littering, the disturbance of sensitive resources like the seepage spring), signs of violations in rules & regulations (e.g., hunting, snowmobiling, horseback riding), natural changes in the tract (e.g., tree blow-downs, insect infestations), and the need for and effect of management actions (e.g., trail maintenance). This is also an opportunity to gather feedback from users in the area concerning the site and management actions. On randomly selected days of high use the number of visitors in the area could be counted for a comparison with the number that registered. Visitors observed violating rules & regulations should be tactfully asked to correct their behavior, e.g., remove rubbish dumped on the site. Serious problems requiring immediate attention should be referred to the DNR Conservation Officer, or County Sherrif. A report should be submitted to TNC if further action is advisable.

Action 30. Monitor the Ginseng population (TNC guidelines 1,2,4 ; SNA policies 2,3,5, and 19).

Ginseng is an uncommon plant in the state due to collection efforts. Partch Woods' Ginseng population should be carefully monitored to determine whether the population size is changing and if so, what factors are related to the population change. Whenever managers are on the site they should inspect the

Ginseng population. Particular care should be given to monitoring: 1) the Ginseng just off the trail near the old clearing; and 2) the Ginseng demonstration area. An annual record should be kept of the tract's Ginseng population, its location, and size.

Action 31. Contact the local DNR Conservation Officer (C.O.) and request his assistance in managing the site (TNC guidelines 2,3, and 4; SNA policies 3,4,7,16, and 23).

This action should be taken at least once per year. Since the C.O. is the primary natural resource enforcement officer it is important to bring the site to his attention and familiarize him with its resources and problems. This action is also necessary to obtain advice on management, such as posting, and on enforcement activities.

Action 32. Submit an annual written report to TNC and the SNA Section (if appropriate) (TNC guidelines 1,2,3, and 4; SNA policies 1,2,3, 5,11,13,14,15, and 26).

The annual report shall note completed management actions, progress made in implementing other actions, number of users and violations (compared against preceeding years), solicited and unsolicited comments regarding management, research proposals and studies underway, changes in the resources, and recommendations for changes in the plan. Actions which are taken but which are not included in this plan should be described in detail in the report.

Action 33. Develop and maintain a close relationship with local and regional government officals, natural resource professionals and other appropriate individuals (TNC guidelines 5,6, and 8; SNA policies 4,5,9,13, and 21).

Local and regional governmental officals (e.g., the mayor, county assessor, county board members) and resource management professionals (e.g., the county extension agent, DNR area wildlife manager, Soil Conservation Service district conservationist, U.S. Fish & Wildlife managers) should be annually contacted and informed about the site. These individuals are all concerned with natural resources in their respective capacities. They should be aware of the site, its importance, and major management actions which are planned for or being implemented on the tract. This action can help eliminate public suspicions and misconceptions, build trust and rapport, and increase community support. It is also another way of monitoring what the public feels about the site and the managers.

Local and regional resource management professionals are another important group to keep in close contact with. These individuals, if they are aware of the site and interested in its preservation, can provide valuable expertise and manpower, and lend equipment if needed for management. As local residents they can help generate community support for the tract. Cooperative management efforts can also sometimes be used to solve problems which affect (or could affect) several sites in the area, including the preserve.

Action 34 .. Maintain close contact with all scientists who are using the site for educational and research purposes (TNC guidelines 4, 5, and 6; SNA policies 1,2,3,4,5,9,12,13, and 15).

Scientists, as trained observers, can provide valuable information and insights for managing the site. Data gathered from scientific studies are also important for monitoring the site. Thus all scientists using the site will be annually contacted. Researchers conducting studies will be consulted about their data and conclusions. Researchers should inform TNC and the DNR (if appropriate) immediately of important natural changes and human impacts they discover. Researchers should furthermore be consulted and encouraged to offer input into managing the tract. Finally, research information should be accumulated, stored in a site file, and shared with interested researchers.

OWNERSHIP MODIFICATIONS

Four ownership modifications are called for in the Partch Woods' management plan. First, land should be acquired either by donation, purchase or easement from Dr. Max Partch for parking and access on the site's east-central boundary. Second, conservation easements should be acquired on the north and west boundaries to provide a buffer area for the preserve. These easements will preclude major changes from the present agricultural land use. The easements should extend up to half a mile from the tract's boundaries. The third boundary change is dependent upon the land owner's decision regarding the cow lane on the southeastern edge of the site (See Action 2). If he wants to keep the cow lane and is amenable to the swap the boundary change described in Action 2 will occur.

A fourth ownership modification may occur if Dr. Max Partch donates the forty acres south of the western half of the present site to the Nature Conservancy. This is mostly a wet meadow, somewhat degraded as a result of ditching, mowing and grazing. However, it also includes the natural boundary of the woods and contains different communities in the wet meadow. In addition, the parcel would act as a buffer zone. If and when the land is acquired by TNC the management plan should be modified to include this area.

III. REVIEW OF THE PLAN

The site objectives and actions outlined in this plan must be considered as provisional, not definitive, and should be reviewed periodically to see that they are still relevant in light of current conditions. Changes in the site's resources, users and other management considerations are bound to occur. If warranted the plan's management actions can and should be modified so that they more effectively and/or efficently implement TNC guidelines and SNA policies (if the site is designated). All proposed actions should be primarily directed at protecting and preserving elements which are a significant part of Minnesota's natural diversity. In any event the plan should be thoroughly reviewed and updated at a minimum of every ten years.

Management Plan Summary for Partch Woods

TNC's strategy for Partch Woods is to develop a cooperative management alliance consisting of TNC, local citizens and the DNR's Scientific and Natural Area (SNA) Program (See the Ripley Esker management summary). The following 32 management actions have been proposed for Partch Woods. They are listed in outline form and are not in order of priority.

Resource Management Actions:

1. Erect fences on the east boundary and the east half of the south boundary, and maintain all of the boundary fences. This action is necessary to prevent grazing.
2. Consult with the adjacent landowner concerning the use of the SE corner as a cow lane. This constitutes encroachment and should be stopped. The owner could be asked, however, if he would trade his 2.2 acres to the south of the four acres between the woods and the road for this right.
3. Implement a wildfire suppression plan.
4. No effort should be made to control or remove diseased plants from the tract (Dutch Elm disease and Oak Wilt may be present on the site).
5. Periodically collect Ginseng seeds and store them under controlled conditions in a gene bank. This will insure a seed source to replant the area if necessary.
6. Clip off all of the Ginseng plant tops in late summer. This action is necessary to discourage collectors.
7. Collect additional information on the tract's resident bird population.
8. Inventory the site's amphibian and reptile populations (not done in 1977).
9. Collect additional information on the tract's non-vascular plants and the early spring vascular plants.
10. Survey Partch Woods' water quality and hydrology (not done in 1977).

Use Management Actions:

11. Post new signs on all the tract's boundaries and maintain the signs. The new signs will be more attractive and less negative than the old TNC signs they replace.
12. Erect a main recognition sign near the parking area and maintain it.
13. Develop a map showing the tract's boundaries, trails, and general features of interest and distribute it to users, potential users and adjacent landowners.
14. Develop and distribute a brochure on Partch Woods.
15. Maintain the registration box and its supplies (maps, brochures, etc.). When the parking area is completed the box will have to be moved.

16. Develop and implement a parking plan. A small parking area should be build near the road on the tract's east side, on the land owned by Dr. Partch.

17. Construct and maintain a walk-around horse-proof structure at the entrance to the tract's trails. This is necessary to prevent unauthorized use.

18. Develop a new trail to connect the parking area with the main trail.

19. Maintain the main trail on the northern part of the site, the west loop, the "fox trail" loop and the parking area near spur trail.

20. Close all the trails on the site except for those noted above.

21. Develop and maintain a Ginseng demonstration area adjacent to the main trail in the north central part of the site. This unconventional action is being taken because secrecy has failed to adequately protect the plant elsewhere.

22. Conduct guided field walks in Partch Woods.

23. Encourage local secondary schools, regional education institutions and researchers to use the site if appropriate.

Monitoring Actions:

24. Recruit a local volunteer manager preferably living within 4 miles of the site.

25. Hold periodic meetings for the local residents.

26. Develop and maintain a close relationship with local and regional government officials, natural resources professionals and other appropriate individuals.

27. Contact the local DNR Conservation Officer and enlist his support.

28. Maintain close contact with all scientists who are using the site.

29. Periodically inspect the site for human impacts, natural changes in the site's resources, and to evaluate the effect of management actions.

30. Develop and implement a vegetative monitoring program which includes setting up permanent releves and photopoints, and taking color IR aerial photographs.

31. Monitor the Ginseng population. An annual record should be kept of the tract's population, including stem counts, counts of plants which flower or fruit, a map showing the plants' location, and any trends which are identified.

32. Submit an annual written report to TNC and the SNA Program (if appropriate).

Ownership Modifications:

Dr. Partch's land on the site's east-central boundary should be acquired for parking and access. Conservation easements should be sought on the north and west boundaries to provide a buffer area. The forty acres south of the west half of the site, a wet meadow, are being donated to TNC by Dr. Partch. Finally, a boundary change may occur on the SE side if the landowner wants to keep using the cow lane.

ERRATA

Action 3 . Implement a wildfire suppression plan (TNC guideline 8; SNA policy 4).

Wildfires may threaten human health and property adjacent to the tract. However, the practices used to suppress wildfires may be more damaging to the site than the fire itself. Fire control should be to safely prevent the spread of the fire outside of the tract's boundaries, and be designed to minimize the damage produced by fire suppression activities. Several steps will be taken to achieve this goal.

Local fire authorities, the fire chief of the local fire department and the DNR area forester, should be contacted annually about control methods to use should a wildfire start on or spread into the tract. These authorities should be made aware of the nature of the tract and TNC's concern about what suppression methods are used on the site. They should be asked to consider using natural fire breaks and backfires, rather than heavy equipment and fire plows, to contain the fire. The fire authorities should have the names and telephone numbers of the local volunter manager and TNC Preserve Management Coordinator to contact for assistance in the event of a fire. A map should be provided showing the tract's boundaries, access points, and fire breaks.

Adjacent landowners should also be provided with the names and phone numbers of the local fire department, volunter manager, and TNC Preserve Management Coordinator to contact in case of a fire. If a wildfire does occur on the tract the neighbors can serve as an "early warning network", alerting the proper individuals. During extreme fire danger periods neighbors, and visitors, should be alerted to prevent man-caused fires and to be on the lookout for fires. In general,however,fire should not be a problem since climax deciduous woods do not produce fuels that create a high fire hazard.

Action 12. Post new signs on all the tract's boundaries (TNC guidelines 3, 4,7,8,9, and 10; SNA policies 3,7,15,16, and 22).

All of the tract's boundaries should be posted to prevent inadvertent encroachment by adjacent landowners, to minimize unauthorized activities (e.g., hunting), and to identify the area's boundaries to users and managers. TNC's present signs only state what activities are prohibited on the tract; they do not state what activities are allowed or encouraged. Therefore, if the tract is not designated a SNA in the near future, new signs will be posted on an experimental basis on all the tract's boundaries. (The posts will have to be moved to new boundaries after the additions to partch Woods have been made. See Ownership Modifications.) The new signs will be more attractive and less negative than the old TNC signs they replace, helping to promote TNC's cause to the local community and forming a positive image of the tract and its managers. The signs should be set no more than one-tenth mile apart; if visability is obstructed they should be set closer together. At corners posts should be set so that signs are nearly touching and at the same angle as the boundary line. All signs and posts should be checked annually and repaired and replaced when necessary. As noted above, the new signs are an experiment: if problems develop on the tract then the signs may have to be changed.
The above action does not apply if the tract is designated a SNA. If this occurs, the SNA Program will determine what action should be taken on posting. All TNC signs will be phased out.

Actions 24-5. Encourage local middle and secondary schools, regional higher education institutions and researchers to use the site if appropriate (TNC guidelines 6 and 10; SNA policies 4,12,14,15 & 26).

All local secondary schools, St. Cloud State and St. John's Universities, the College of St. Benedict, Brainerd Community College, Willmar Community College, and other scientific research groups should at least know of the site's existence, its potential for teaching such topics as native flora and fauna, ecology and geology, and who to contact for more information (e.g., the local volunter manager, TNC preserve management coordinator, DNR regional naturalist). An effort should be made to meet annually with all teachers and researchers who express an interest in the site. Educational and research opportunities can be promoted at these meetings. However, the sensitivity of the resources and user responsibility in caring for the land must be stressed at these meetings. Use should only be encouraged if appropriate, i.e., if such use cannot occur equally well on less vulnerable areas. All teachers and researchers should be aware of the site rules & regulations, such as the need to obtain a permit prior to collecting or conducting research in the area before they enter the site. Before a class comes to the tract teacher workshops should be held so that the teachers are trained and well-informed about the area. When the class comes to the site managers or scientists should, if possible, also be present to assist the teachers.

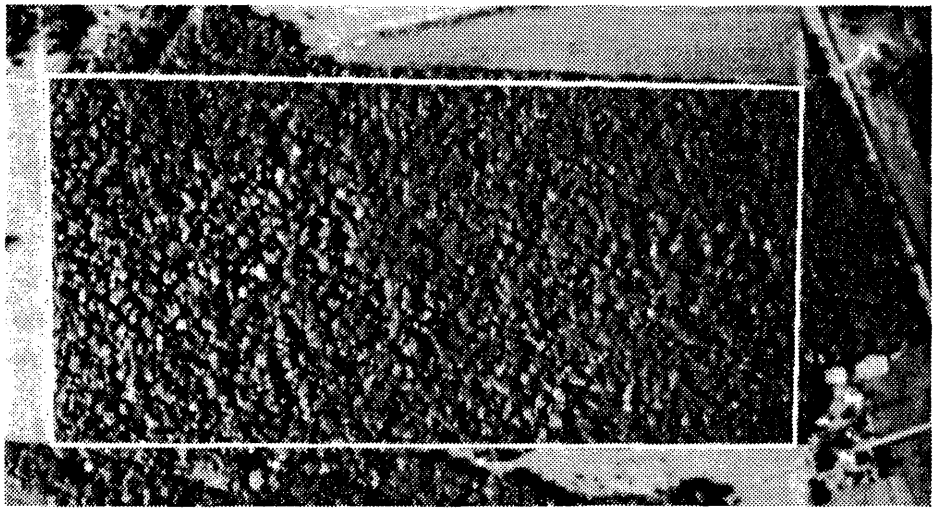
The 1977 Inventory
for
Partch Woods
Stearns County, Minnesota

SW¼ of NW¼ and SW¼ of NE¼, Section 19
Township 125 North, Range 29 West
Latitude 45 Degrees, 37' 30"
Longitude 94 Degrees, 22' 30"

Prepared by
The Minnesota Chapter of The Nature Conservancy
and
The Scientific and Natural Areas Section
Division of Parks and Recreation
Minnesota Department of Natural Resources

December, 1979

Rough Draft



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Aerial photograph of Partch Woods taken in 1976.
Scale: approximately 8":1 mile.

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INTRODUCTION

SCOPE AND ORGANIZATION

The primary purpose of this document is to provide data necessary for the Heritage Program to evaluate the significance of Partch Woods. This evaluation will be used to determine if the tract qualifies as a Scientific and Natural Area (SNA). In addition, the inventory provides information on the site's viability, notes man-made disturbances, identifies fragile, sensitive resources, and provides a temporal baseline from which changes in the area can be identified. This information is useful to the Heritage Program evaluators, to scientists who may study the area, and to SNA managers should the site be designated a SNA.

The Partch Woods inventory is divided into nine sections covering climate, the unit's physical resources (geology, soils, water resources), plant communities and the various biological subdivisions (flora, butterflies, birds and mammals).[1] In addition to identifying and cataloging the tract's natural features each section describes the reasons for conducting the inventory, describes the inventory methods used, highlights elements which researchers have labeled "significant", and points out additional inventory data which could be collected on the site.

The final two sections of the inventory are concerned with human activities on and adjacent to the site. The land use history section describes how the tract has been changed through human activities, where known, and identifies adjacent land uses. The natural area visitor

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1 No information was collected by the 1977 inventory team on the site's amphibians and reptiles. Thus no information is presented in this document on these animals.

section points out regional population centers and educational and research centers which may be sources of users.

The Partch Woods inventory represents the culmination of many individual efforts. The inventory was completed in the summer of 1977 by six Nature Conservancy student interns: Kathryn Bolin, Robert Dana, John Dorio, Erik Englbretson, Steve Hansen and Hagdis Tschunko. These individuals did all the research and preliminary writing. Each member of the team was responsible for completing a part of the inventory in which they had expertise. Approximately 175 hours were spent on the unit by the researchers. At least two to three times that amount of time was spent in preparation of specimens, researching literature, processing and analyzing data and writing. Mr. Mark Heitlinger, The Nature Conservancy Coordinator of Preserve Management, Minnesota Chapter, helped supervise and edit the inventories. Michael Rees, Scientific and Natural Areas Research Writer prepared the final inventory. Martha Cashman, Graduate Research Assistant, Laboratory for Research in Scientific Communication, University of Minnesota, provided valuable editorial assistance during the course of writing the final document. Other individuals who assisted in the preparation of this inventory are mentioned in the appropriate sections. Their help is gratefully acknowledged.

Unit Overview

Partch Woods is an eighty acre mature maple-basswood forest island in a predominately agricultural area. It is located in Stearns County, 10.2 miles northwest of St. Cloud in central Minnesota. The landscape, shaped by glaciers, is flat to gently rolling with some well-weathered gullies. Maximum relief of the area is no more than fifty feet. A seepage spring is also present, emerging in the west-central part of the unit.

Most of Partch Woods is near typical upland climax maple-basswood forest. Some lowland forest and early and intermediate successional stages are also present. A total of one hundred and twenty-seven vascular plants grow in Partch Woods. Virtually all of these species are Minnesota natives. The area is known to contain ten species of butterflies, thirty species of birds and seven mammal species.

Partch Woods has not completely escaped human disturbance. One part of the unit is recovering from logging in 1896. In 1957 veneer logs were selectively cut throughout the area. However, the signs of past disturbance are now disappearing.

The area is significant because it is representative of a relatively undisturbed maple-basswood forest, an important element of Minnesota's natural heritage, and because forest like Partch Woods are uncommon in Stearns County. Furthermore, Partch Woods is one of the few surviving maple-basswood stands near the western border of the hardwood forest formation at this latitude. The forest harbors a diverse flora, including one rare species, Ginseng. Finally, the forest has been the site of on-going research for many years. For all of these reasons Partch Woods is a potential Scientific and Natural Area.

CLIMATE

Climate has a major influence on the biotic and physical resources of Partch Woods. Species diversity, density and distribution, soil type, erosion, hydrology and land use are all affected by temperature, precipitation and wind.

Methods

Climatological data were gathered by researching National Oceanic and Atmospheric Administration and Minnesota Agricultural Experimental Station reports. Local weather data were gathered from the St. Cloud NOAA weather station.

Regional Climate[1]

Partch Wood's climate is subject to marked changes in temperature which characterize all of Minnesota. The area experiences frequent periods of cold Arctic air during the winter months. A typical winter has five to ten days with temperatures ranging from -20 to -30 degrees Fahrenheit. Although winters are cold, strong winds and high humidities are generally absent on the coldest days.

The region's growing season is fairly short, extending from mid-May to the end of September, averaging 140 days per year. Since the Gulf of Mexico air masses seldom reach this far northward, prolonged periods of hot and humid weather are infrequent in this area. Only once in every five to ten years does the temperature exceed 100 degrees Fahrenheit, and then usually for only one day.

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1 The following information is taken from NOAA 1976 Local Climatological Data: Annual summary . . . . .

Approximately 60% of the region's average 26.8 inches of precipitation (water equivalent) falls during the months of May through September; June is the wettest month of the year. The principal source of rain during this season is thunderstorms. Average annual snowfall is 43.1 inches, with the heaviest snow falls occurring in March.

Damaging storms such as severe blizzards, tornadoes and ice storms, occur infrequently in the region. The occurrence of ice storms, causing extensive damage to trees, averages less than once a year. However, heavy rains, winds and hail associated with thunderstorm line squalls occurs each year in the region.

Table I is a summary of selected temperature and precipitation data for the St. Cloud area.

Sources of Information

Baker, D.G. and J.H. Strub, Jr. 1963a. Climate of Minnesota: Part I. Probability of occurrence in spring and fall of selected low temperatures. Minnesota Agr. Exp. Sta. Tech. Bulletin 243. 40 p.

_____ 1963b. Climate of Minnesota: Part II. The agricultural and minimum-temperature-free seasons. Minnesota Agr. Exp. Sta. Tech. Bulletin 245. 32 p.

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National Oceanic and Atmospheric Administration (NOAA) Environmental Data Service. 1976. Local climatological data: annual summary with comparative data, St. Cloud, Minnesota. National Climatic Center, Asheville, N.C.

GEOLOGY

The earth's rocks, minerals, and topography form the physical landscape we see today. The type of bedrock, glacial drift, and erosion affects the soil and groundwater, which in turn influence the vegetation. The land's relief, slope and aspect affect hydrology, microclimate, soil formation, and the biotic community. Some geological formations are visually striking illustrating geological processes; other features are more subtle,

Table 1. Selected Weather Data for St. Cloud.[a]

TEMPERATURE	°F	°C
Mean annual temperature:	41.7	5.4
Mean annual daily maximum temperature:	52.4	11.3
Mean annual daily minimum temperature:	31.0	-0.6
Highest temperature recorded (July, 1940, Aug., 1947):	103.0	39.4
Lowest temperature recorded (Jan., 1951):	-40.0	-40.0
Average temperature warmest month (July):	70.2	21.2
Average daily maximum--July:	81.8	27.7
Average daily minimum--July:	58.6	14.8
Average temperature coldest month (January):	8.9	-12.8
Average daily maximum--January:	19.2	-7.1
Average daily minimum--January:	-1.4	-18.6
Average date last occurrence 32°F (0°C) or less (spring):	c. 5 May[b]	
Average date first occurrence 32°F (0°C) or less (fall):	c. 1 Oct.[c]	
Average number days in growing season (period free of 32°F (0°C) or less):	c. 140[d]	
Average growing degree days, T_b = 40°F (4.4°C):	4102[e]	
Average growing degree days, T_b = 50°F (10.0°C):	2377[e]	

PRECIPITATION	in.	cm.
Average annual precipitation (water equivalent):	26.84	68.17
Average annual snowfall:	43.10	109.47
Average precipitation wettest month (June):	4.64	11.78
Average precipitation (water equivalent) driest month (Jan.)	0.76	1.93
Average snowfall heaviest month (March):	9.9	25.15

[a]All data except that noted otherwise is from National Oceanic and Atmospheric Administration, Environmental Data Service. 1976. Local Climatological Data: Annual Summary with Comparative Data, St. Cloud, Minnesota. National Climatic Center, Asheville, N. C.

[b]Based on Figure 3. Baker, D. G., and J. H. Strub, Jr. 1963a. Climate of Minnesota: Part I. Probability of Occurrence in Spring and Fall of Selected Low Temperatures. Minnesota Agr. Exp. Sta. Tech. Bull. 243.

[c]Based on Figure 4. Baker and Strub, 1963a.

[d]Based on Figure 16. Baker, D. G., and J. H. Strub, Jr. 1963b. Climate of Minnesota: Part II. The Agricultural and Minimum-Temperature-Free Seasons. Minnesota Agr. Exp. Sta. Tech. Bull. 245.

[e]From Appendix Table 2. Baker, D. G., and J. H. Strub, Jr. 1965. Climate of Minnesota: Part III. Temperature and Its Applications. Minnesota Agr. Exp. Sta. Tech. Bull. 248.

Growing degree days = $\Sigma(\overline{T} - T_b)$ where $\overline{T}$ = mean daily temperature and T_b = selected baseline temperature (40° F or 50° F).

such as fossils showing how life has developed on the earth. Protecting examples of geological features is one important part of protecting natural diversity in Minnesota.

Methods

Geologic information was primarily obtained through a literature search. Three field surveys using maps and aerial photographs aided in interpretation. Professors George Shurr and Max Partch of St. Cloud State University were also consulted during the inventory, and provided information about the origin and development of land forms on the area.

Historical Geology

Like all of central Minnesota, Partch Woods' physical landscape owes much of its present configuration to the late Wisconsin glaciers of the Pleistocene Epoch. Approximately 20,500 years ago the Rainy and Superior glacial lobes descended from Canada and covered most of east central Minnesota. One sublobe of these glaciers, the Pierz, covered the Partch Woods region. This glacier deposited a series of low, elongated hills of glacial till called drumlins. Partch Woods is on the southern tip of a drumlin field called the Darling Drumlin Area. As the Pierz sublobes receded it left behind other hills of glacial till, known as the St. Croix moraine, which the tract borders. Figure 1 shows Partch Woods location relative to these geomorphic regions, and the location of eight other nearby potential Scientific and Natural Areas. After the glaciers retreated the flow of water eroded the landscape, creating the gullies and hills which are present on the land today.

Partch Woods Today

Partch Woods is underlined by 50-100 feet of till derived from the Pierz sublobe glacier and other glaciers. No outcrops are apparent on the site. There are, however, many glacial erratics and cobbles(boulders

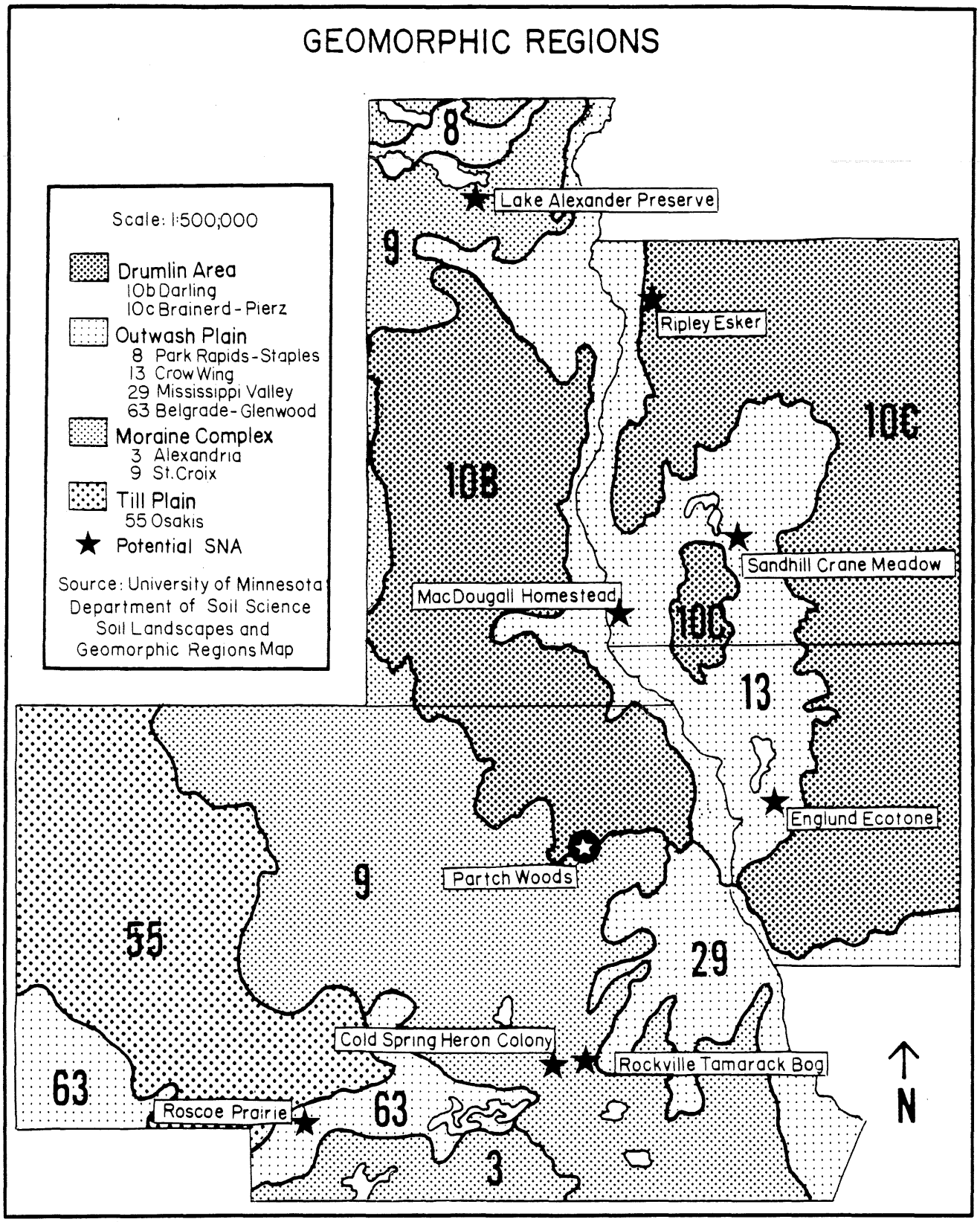

Figure 1. Partch Woods and nearby potential Scientific & Natural Areas in relation to geomorphic regions in central Minnesota (Benton, Morrison and Stearns Counties).

and smaller rocks transported and deposited by the glaciers) near the seepage spring and on the more eroded low areas. These rocks indicate glacial drift with an eastern origin.

The bedrock below the drift is the northwestern part of the Stearns Magma Series, a part of the Animike group, originating 1.6 - 1.8 billion years ago (Woyski, 1949). This is a group of metamorphic and igneous rocks with granites as the major contributor. Figure 2 shows the bedrock of Partch Woods and the potential SNAs nearby.

Partch Woods' landscape today is flat to gently rolling, with a range in elevation of fifty feet maximum. The highest point of the unit is about 1170 feet near the northwest corner, while the southern lowland is at the lowest elevation of about 1120 feet. All the area's hills and gullies are smooth and well-weathered. Figure 3 shows Partch Woods topography. Three topographic features can be distinguished on the tract: 1) the flat to gently south-sloping uplands in the northern third of the unit; 2) the gently sloping lowlands of the southern edge of the unit; and 3) a central area with steeper and rougher terrain. The site contains a major gully located in the east central area. Another gully in the west-central area contains a seepage spring. In addition, there are many smaller hills and gullies in the central area.

Sources of Information

Bray, Edmund C. 1977. Billions of Years in Minnesota. North Central Publishing Company, St. Paul, Minnesota.

Schneider, Allan F. 1961. Pleistocene geology of the Randall region, central Minnesota. Bulletin #40. Minnesota Geological Survey. University of Minnesota Press, Minneapolis, Minnesota.

U.S. Department of the Interior, Geological Survey (USGS). 1965. Holdingford Quadrangle, MN: 7.5 Minute Series (topographic). 1:24,000. Denver, CO.

_____. 1965. Avon Quadrangle, MN: 7.5 Minute Series (topographic). 1: 24,000. Denver, CO.

_____.. 1965. St. Joseph Quadrangle, MN: 7.5 Minute Series (topographic). 1:24,000. Denver, CO.

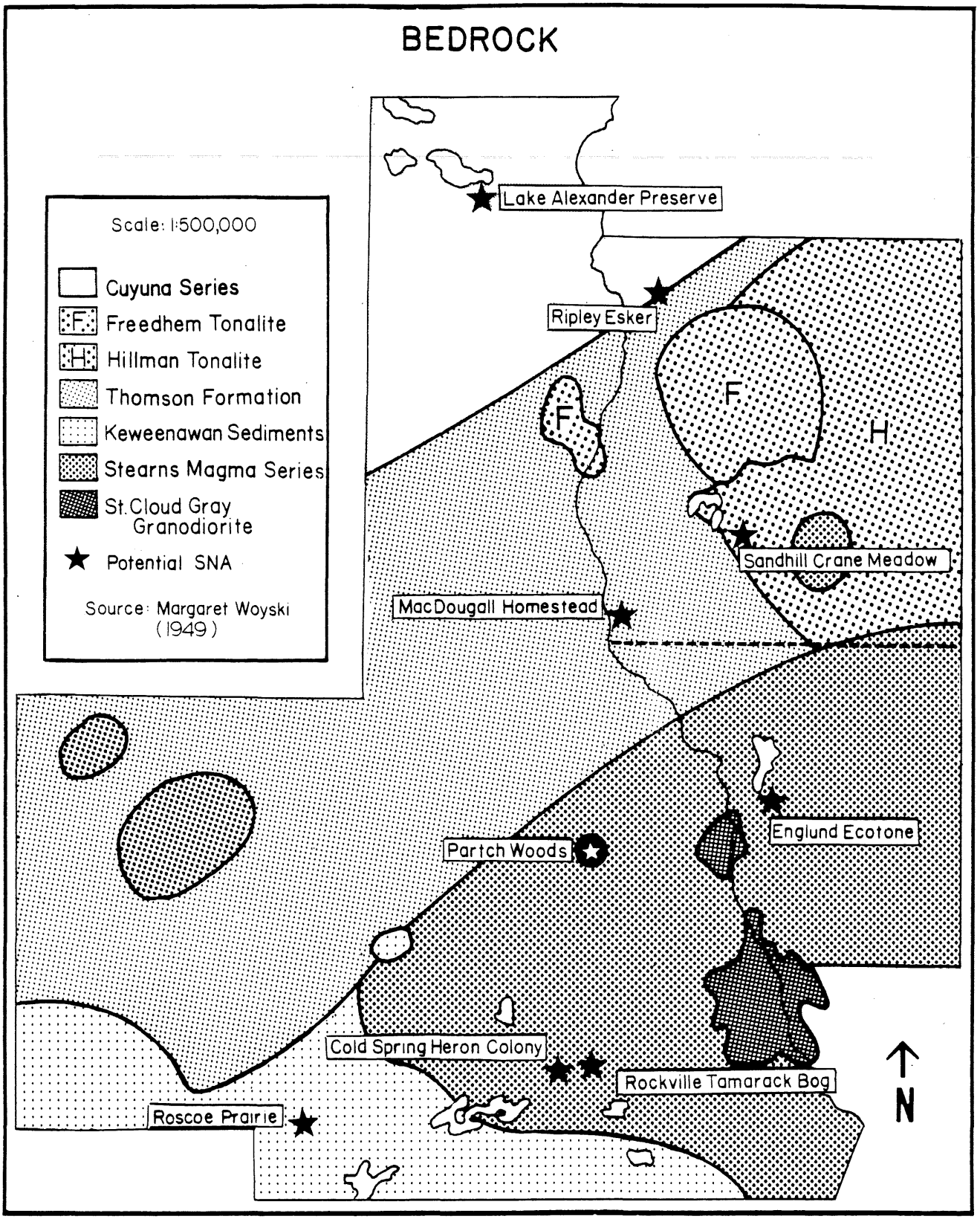

Figure 2. Bedrock formations in the area of Partch Woods and nearby potential Scientific & Natural Areas in central Minnesota (Benton, Morrison, and Stearns Counties).

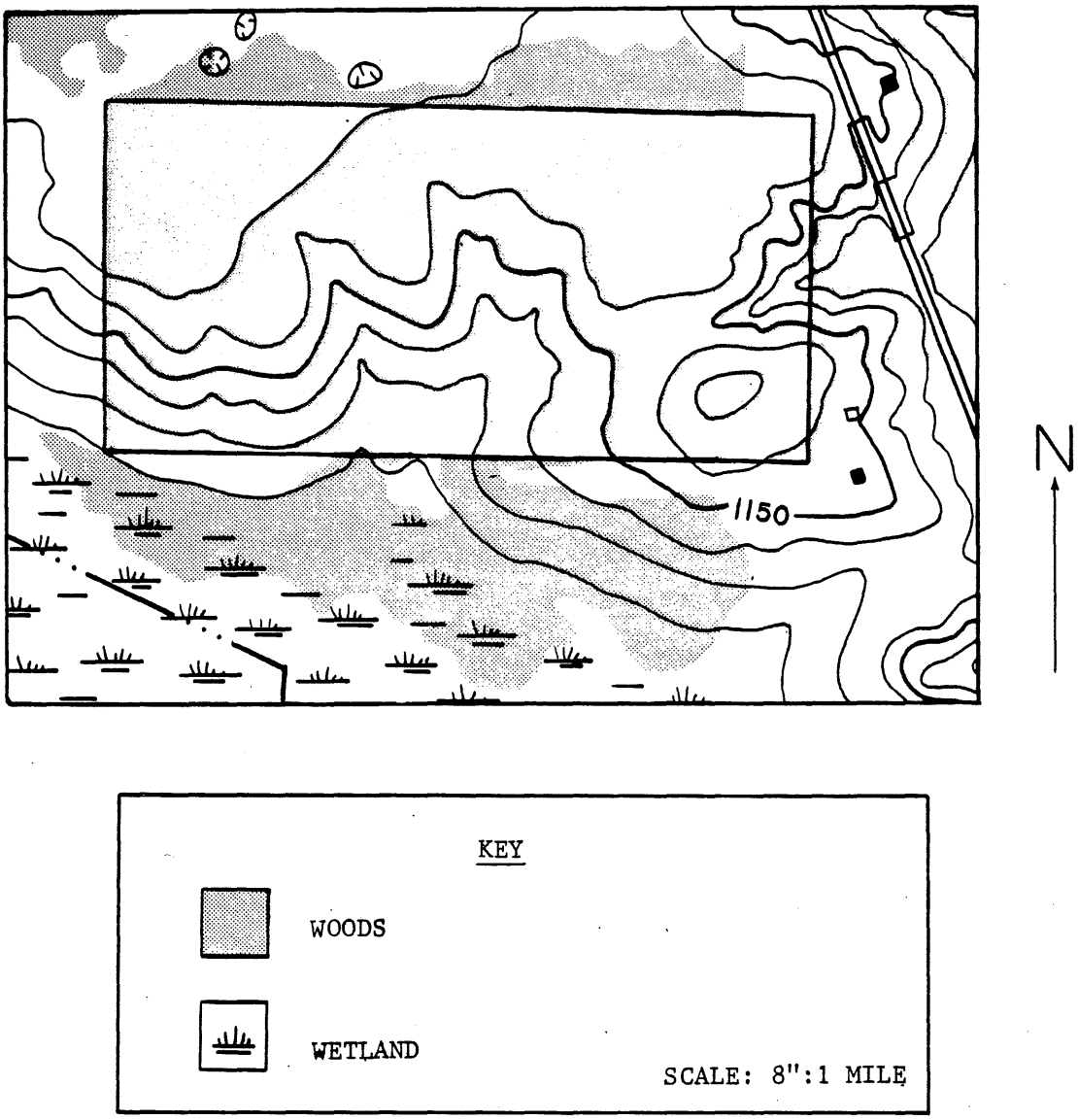

Figure 3. Topography of Partch Woods. Elevations are in feet above mean sea level. The contour line interval is ten feet. Adapted from the U.S. Geological Survey, Avon, Holdingford, St. Joseph and St. Stephen Quadrangles (1:24,000; 1965).

_____. 1965. St. Stephen Quadrangle, MN: 7.5 Minute Series (topographic). 1:24,000. Denver, CO.

University of Minnesota Department of Soil Science in cooperation with Minnesota Geological Survey and U. S. Department of Agriculture, Soil Conservation Service. 1975. Minnesota Soil Atlas:Soil Landscapes and Geomorphic Regions. St. Cloud Sheet.

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SOILS

Soils are one of the earth's most important resources. The decomposition of organic material, recycling of nutrients, ground water recharge, erosion and drainage are all affected by the soils. Plants depend on the soils for their anchoring medium, water, and nutrients. Soils are also an indicator of past and present climate, parent material, topography and vegetation. Soil inventories are necessary to help determine the above information, to identify rare soil types, and to establish a baseline so changes occurring in the soil over time can be monitored.

Methods

Soil information for this inventory was obtained from the literature and from a detailed soil survey.[1] The soil survey was conducted on 28 July 1977 and during the week of 8 August, 1977. A hydraulically powered probe was used to make an initial boring to a depth of five feet immediately outside the tract's northeast corner boundary. A standard 3½ foot hand probe and five foot bucket auger were used in sampling soils within the unit's boundaries. A detailed soil map was then drawn based on the survey data.

1 The following professionals were consulted and gave valuable help during the inventory: Professor Harold Arneman, Department of Soil Science, University of Minnesota. H.R. Finney, Minnesota State Soil Coordinator, St. Paul. Charles K. Sutton, Stearns County Soil Survey Team Leader, United States Department of Agriculture-Soil Conservation Service, St. Cloud.

Partch Woods' Soils

Partch Woods is located in the southern tip of the Darling Drumlin area. Soils of the rolling and gently sloping drumlin area are light colored, well-drained, coarse to medium textured forest soils. They are formed from sandy loam and loam glacial till (Arenman 1963; USGS, SCS, University of Minnesota Soils Department, 1975, USDA -SCS, 1973).

Table 2 and Figure 4 shows Partch Woods' soil and their characteristics.[1] Four major soils series are evident. The Brainerd soils are typically well-drained soils found on crests and side-slopes of drumlins and ground moraines. Their surface layers are very dark gray to dark brown sandy loam ranging from three to seven inches in depth. The dark brown, sandy loam lower soil horizons exhibit spots or blotches of different color, called mottles. The lower soil horizons are characterized by a hard layer of soil called a fragipan where percolation of water is extremely slow, if at all, and root penetration is difficult.

The deep, well-drained Flak soils are also usually found on crests and side-slopes of drumlins and ground moraines. Their surface layers are very dark brown to brown, fine sandy loam ranging from ten to sixteen inches in depth. A distinct fragipan extends through the brown sandy loam lower horizons.

The somewhat poorly-drained Nokay soils occur on level or nearly level positions on drumlin fields and ground moraines. Their mottled surface layers are black, fine sandy loam and fragipan also extends through their brown sandy-loam lower horizons.

Taken together, the Flak-Brainderd-Nokay soils constitute a soil toposequence: a group of associated soils developed from the same or similar parent material, but differing in topographic location. This

1 A table listing the soil characteristics of eight potential SNAs, including Partch Woods, is on file, The Nature Conservancy, Minnesota Chapter.

Key to Table 2.: Partch Woods' Soils and Soil Characteristics.

TEXTURE: Relative proportions of various soil separates (silt, sand, clay) in a soil.

Topsoil: "surface soil"; in uncultivated soils, a depth of 3 or 4 to 8 or 10 inches; in agriculture, refers to the layer of soil moved in cultivation.

Subsoil: soil below the topsoil, from 8 to 10 to 60 inches.

DRAINAGE CLASS: Soil drainage refers to natural frequency and duration of saturation which exists during soil development. Soil drainage classes are those used in making detailed soil maps (Arneman & Rust, 1975; USDA-SCS & Agr. Expt. Sta., 1977).

PD - Poorly Drained. Water table seasonally near surface for prolonged intervals. Water table from 18 to 36 inches. Soils wet for long periods, generally with mottles.

MWD - Moderately Well Drained. Water table usually below five feet. Soils are wet for small but significant part of time. Mottling in lower B horizon.

WD - Well Drained. Water is removed from soil readily but not rapidly. Soils are nearly free of mottling.

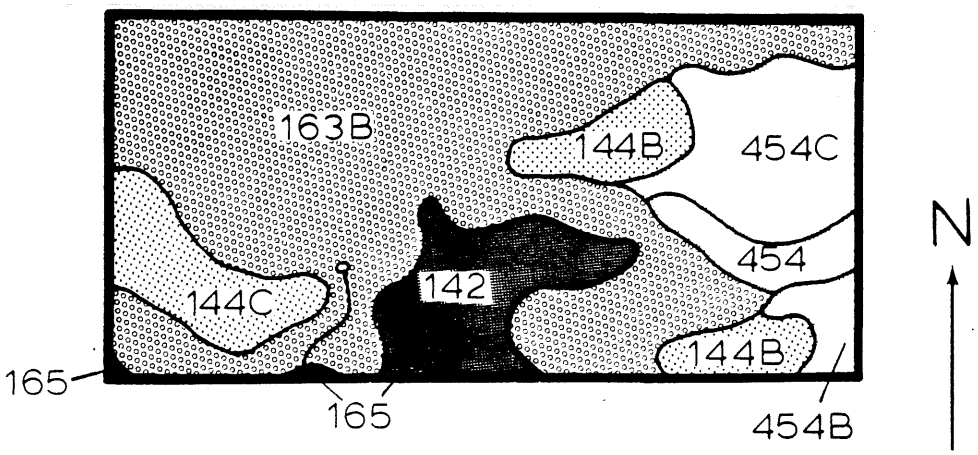
ED - Excessively Drained. Water is removed very rapidly. Soils are without mottles.

COMPONENT IN STATE: Extent of acreage in state.

M - Major: 100,000 acres or more
I - Intermediate: 10,000 to 100,000 acres

Table 2. Partch Woods' Soils and Soil Characteristics

	SOIL SERIES (Mapping unit)	DRAINAGE CLASS	DEPTH TO WATER TABLE	PARENT MATERIAL	LANDSCAPE POSITION	TEXTURE		VEGETATION		COMPONENT IN STATE	LOCATION IN STATE
						TOPSOIL	SUBSOIL	ORIGINAL	PRESENT		
FOREST SOILS	MAHTO-MEDI (454)	ED	6'	Rainy lobe till (glacial)	moraines, outwash plains 1-40% slopes	loamy sand	sand coarse sand, gravel	mixed deciduous woods	mature woods	I	North & Central
	FLAK (144)	WD	6'	Rainy lobe till (glacial)	side slopes of ground moraines & drumlins 2-25% slopes	fine sandy loam	sandy loam	mixed deciduous woods	mature woods	M	Central & East Central
	BRAINERD (163)	MWD	1.5 - 2.5'	Rainy lobe till (glacial)	side slopes of ground moraines & drumlins 2-7% slopes	sandy loam	sandy loam	mixed deciduous woods	mature woods	M	Central & East Central
	NOKAY (142)	PD	2-4'	Rainy lobe till (glacial)	bases of slopes, heads of drainage ways 1-2% slopes	fine sandy loam	sandy loam	mixed deciduous woods	mature woods	I	Central



KEY

Symbol	Soil Series	Drainage Class
454	Mahtomedi	Excessively Drained
144	Flak	Well Drained
163	Brainerd	Moderately Well Drained
142	Nokay	Poorly Drained
165	Parent	Poorly Drained

Seepage Spring

B 2 to 6% Slope

C 6 to 12% Slope

SCALE: 8": 1 MILE

Figure 4. Partch Woods' soils. The soil series are arranged according to drainage. The map is based on information supplied by the U.S. Soil Conservation Service.

difference in topography in turn results in drainage differences among the soils.

The excessively drained Mahtomedi soils are found on upland areas of ground moraines and outwash plains. A very dark gray, loamy sand surface five or so inches thick covers a layer of brown sand about three inches deep. The lower soil horizons are gravelly, coarse sand to gravelly sand, dark brown to reddish brown in color.

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_____and _____. 1977. Soil survey of Stearns County, Minnesota. Preliminary data, unpublished.

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WATER RESOURCES

Water is another of the key resources which affects the total environment. Besides adding diversity to the physical landscape, water nourishes plants and animals, provides habitat for aquatic organisms, and affects soils and erosion. Possible changes in water chemistry, water table depth and drainage can drastically modify the biotic community. Water recources are studied to identify significant and fragile wet areas, and to help classify the area.

Methods

The major source of information on water resources was the literature. Three field surveys using maps and aerial photographs were also conducted on the unit.

Partch Woods' Water Resources

Partch Woods lies within the Watab Watershed, a part of the Mississippi River drainage basin. The only surface water on the site is a seepage spring which emerges near the west central part of the unit. The stream drains in an irregular pattern to a drainage ditch south of the tract.

Additional Inventory/Research Needs

No surface and subsurface rates of water flowing into or through the area were measured in 1977, nor were any water quality tests conducted. Data should be collected to obtain a more complete hydrologic baseline. The site's hydrology and water chemistry may already be experiencing adverse impacts due to neighboring irrigation practices and the use of fertilizers, pesticides and herbicides. (Knutson, 1971). One useful research project would be to determine what effects, if any, neighboring farm practices are having on the unit's water resources.

Sources of Information

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_____. 1965. Avon Quadrangle. MN:7.5 Minute Series (Topographic) 1:24,000. Denver, Colorado.

_____. 1965. St. Joseph Quadrangle. MN:7.5 Minute Series (Topographic) 1:24,000. Denver, Colorado.

VEGETATIVE COMMUNITES

Vegetative communities are often one of the primary reasons for designating an area a Scientific and Natural Area. The most significant plant communities are those that are rare, provide exceptional examples of the state's plant communities or natural processes, are relict communities, persisting from an earlier period, and/or harbor significant species. Indeed, all significant biotic elements are dependent on the vegetative communities' characteristics: plant communties affect soils, hydrology, microclimate, and individual plant species. They also provide food, cover, and shelter habitat for the area's animal populations. The primary means of holistically viewing and classifying an area's biotic elements is through the plant communities.

In the case of Partch Woods the plant community itself is the primary resource being preserved. Consequently the inventory's baseline data are very important for determining special resource management needs, opportunities for visitors, and future changes in the resource.

Methods

Partch Woods' vegetative communities were categorized according to cover type. A 1976 color infrared aerial photograph was used to delineate the boundaries of each community. Historical vegetative changes were determined through a literature search.

Overview of Regional Plant Communties

Partch Woods is located in the southern edge of the Leaf Hills landscape region of Minnesota. (See Figure 5). This area is a narrow strip of deciduous forest between the prairie and conifer-hardwood forest regions of the state. Figure 6 shows the vegetation of central Minnesota prior to European settlement. For approximately 400 years a mixed deciduous

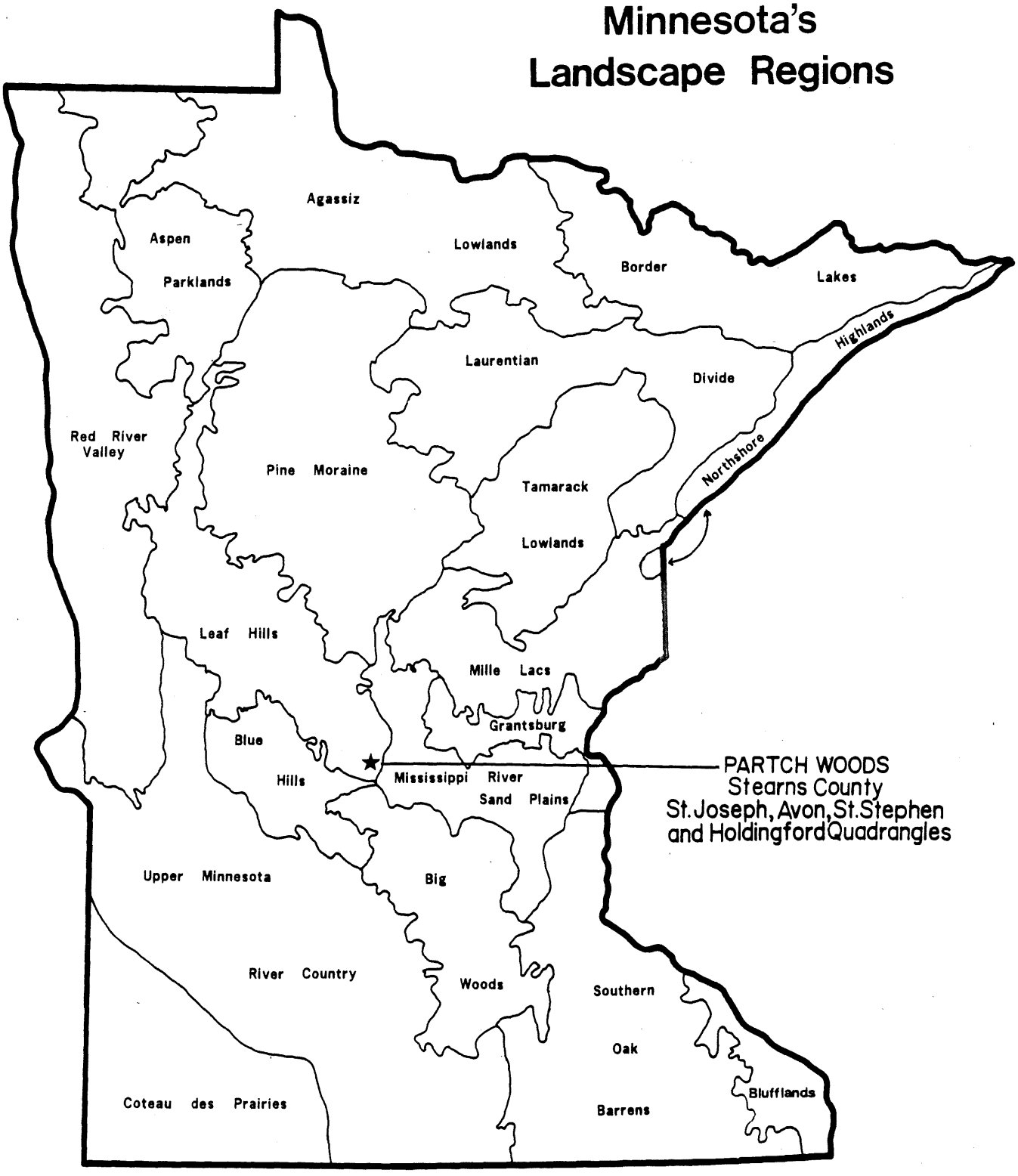

Figure 5. Partch Woods in relation to Minnesota's landscape regions. Adapted from T. Kratz and G.L. Jensen, An ecological geographic division of Minnesota (Unpublished, 1977).

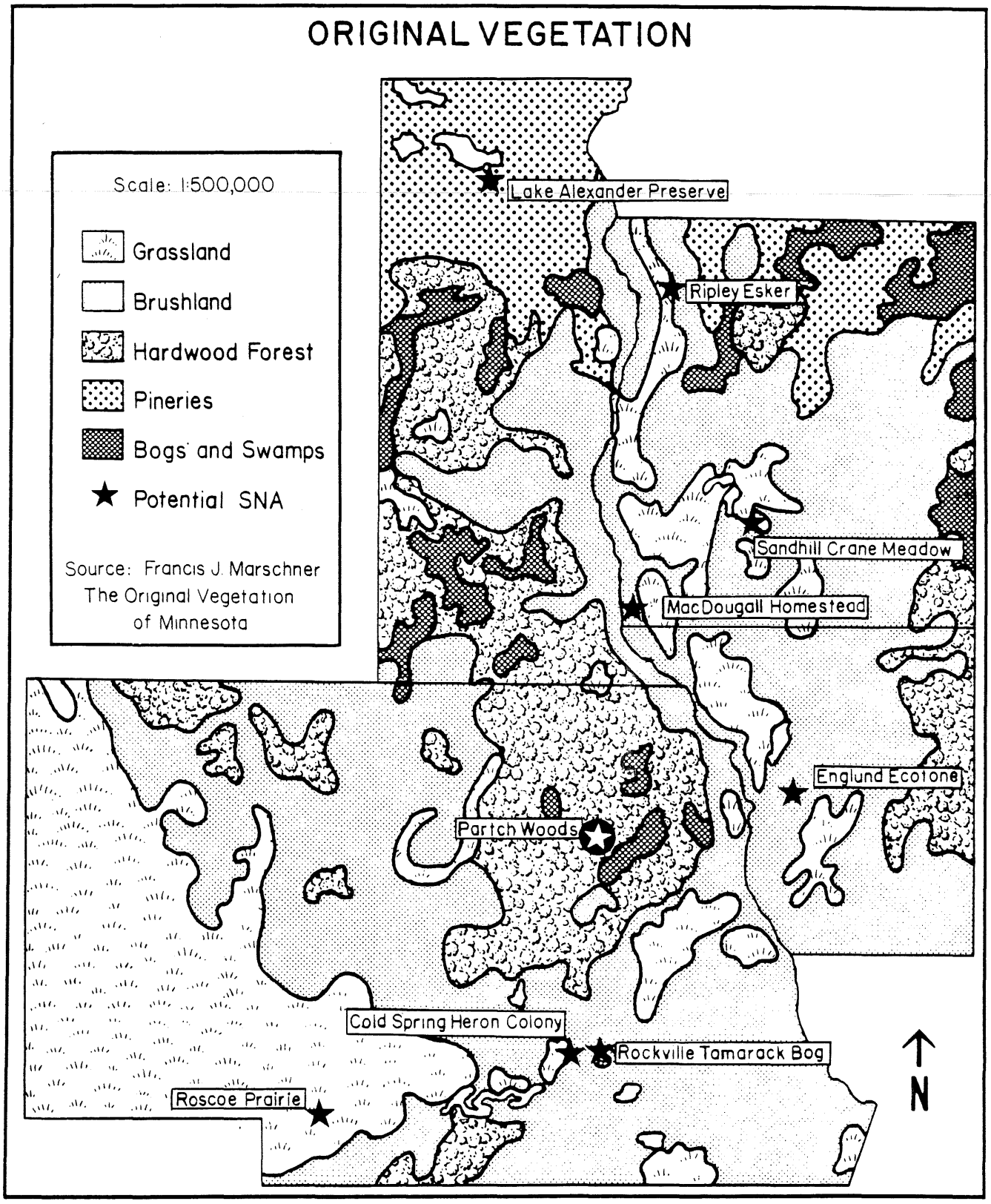

Figure 6. The original vegetation of Partch Woods and nearby potential Scientific & Natural Areas in central Minnesota (Benton, Morrison & Stearns Counties).

forest, sometimes called the Big Woods, has been present in the area around Partch Woods (Waddington, 1969). With European settlement most of the original forest stands were cleared for farming. Partch Woods is a slightly disturbed example of a maple-basswood forest which prevailed before white settlement.

Partch Woods' Vegetative Community

Figure 7 indicates the vegetative communities in and around Partch Woods. The entire Partch Woods site consists of upland and some lowland, climax maple-basswood forest, or successional stages leading to this mature forest. The dominant species of the forest canopy are Sugar Maple (Acer saccharum), Basswood (Tilia americana), and Red Oak (Quercus borealis). Dominant species of the understory include: Large-leafed Aster (Aster macrophyllus), Zig-Zag Goldenrod (Solidago flexicaulis), Enchanter's Nightshade (Circaea quadrisulcata), Hog Peanut (Amphicarpa bracteata) and Lopseed (Phryma leptostachya). Several maple-basswood indicator species designated as modal by Curtis (1959) are present in Partch Woods, including: Ironwood (Ostrya virginiana), Wild Leek (Allium trioccum), Blue Cohosh (Caulophyllum thalictroides), Bloodroot (Sanguinaria candensis), Wake-robin (Trillium cernum) and Downy Yellow Violet (Viola pubescens).

Significance of Partch Woods

Partch Woods is a good example of a maple-basswood forest representative of one important element of Minnesota's natural heritage. Indications are that relatively undisturbed mature maple-basswood forests like Partch Woods are uncommon in Stearns County. Furthermore, the area is significant in that it is one of the few maple-basswood stands near the western border of the hardwood formation at this latitude. (Partch, pers. comm.)

In terms of research and educational significance the area offers many opportunities for studying a mature forest and the successional stages

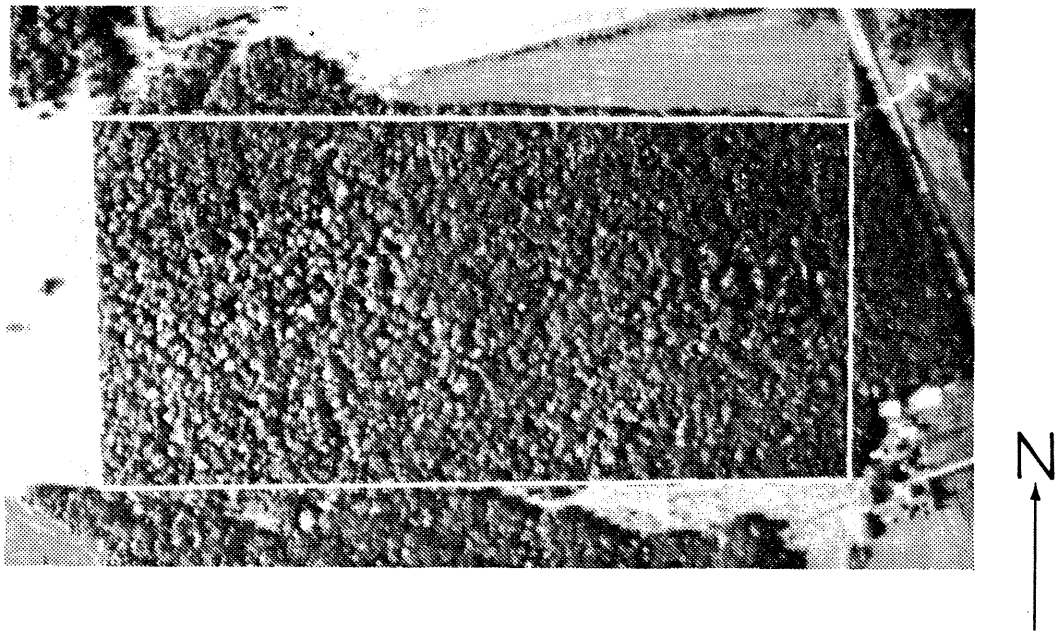

Figure 7. Partch Woods' vegetative communities. The 1976 aerial photograph shows the entire site covered by a maple-basswood forest. Scale: approximately 8": 1 mile.

which lead up to this forest. The area has been monitored for over ten years by Dr. Max Partch, Professor of Biology, St. Cloud State University. He laid out a grid system marked off in acres and tenth acres. There also are 40 permanent quadrats, ½ x 2 meters in size, located on the odd numbered acres as referenced on the grid.

Sources of Information

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FLORA

Plant species are one of the primary components of Minnesota's natural diversity. Plants indicate the diversity of the area, the type of biotic community present, and changes occurring in the area including the degree of human disturbance. Rare plant species may be one reason for designating an area as a SNA.

Methods

Partch Woods' flora were determined by visits into the area on a weekly basis, when weather conditions permitted, from 27 May to 10 September 1977. Flowering or fruiting plants and some non-vascular plants were collected and pressed. All collected plant specimen locations, associated species, and the date of collection were recorded; locations were noted on an aerial photograph of the area.[1] Specimens are housed in the University of Minnesota

1 See The Nature Conservancy, Minnesota Chapter.

Herbarium, Botany Department, St. Paul. A phenological record of Partch Woods' flowering forbs was also kept. The phenological record began on 27 May and ended on 10 September, 1977.

Plants were identified through several sources (cited at the end of this section). John W. Moore, retired Associate Scientist, University of Minnesota, verified sixty specimens, and Max L. Partch, Professor of Biology, St. Cloud State University, verified sixty-six specimens. Nineteen species were accidently lost and could not be verified. Lichens were identified by C. W. Wetmore, Lichenologist at the University of Minnesota.

Partch Woods' Flora

Table 3 lists the plants identified in Partch Woods by family.[1] A total of 127 vascular plant species, representing forty-seven plant families, were recorded on the site in 1977.[2] Seven of the 127 species had not been previously collected from Stearns County and deposited in the University of Minnesota Herbarium. Forbs were the most numerous group with seventy-three (representing 57% of the total number of species present), followed by nineteen species of trees (15% of the total), nineteen species of shrubs (15% of the total), six sedge species (5%), six fern species (5%) and four grass species (3%). The plant families most common on the tract were the lily family with twelve species (9% of the total species), composite family with eleven species (9%) and the Rose family with nine species (7%).

1 Additional plant lists, alphabetically organized by common name, scientific name, and family are on file, The Nature Conservancy, the Minnesota Chapter. Nomenclature is according to Gleason and Cronquist. (1963).

2 In addition to the above plants Dr. Max Partch identified the following plants on the tract prior to 1977: Anemone virginiana, Arisaema Xatrorubens, Cardamine pennsylvanica, Carex sp., Desmodium nudiflorum, Equiset sp., Galium aparine, Geum rivale, Hydrolphyllum sp., Impatiens pallida, Juncus sp., Laportea canadensis, Lilium michauxii, Lycopus sp., Pedicuaris lanceolata, Pilea sp., Polygonatum canaliculatum, Prunella vulgar, Pteridium aquilinum, Rudbeckia laciniata, Smilacina stellata, Thalictr dasycarpum, Trientalis borealis, Triosteum aurantiacum, Urtica gracili, Viola conspersa, Viola paaens, Viola pensylvanicus, Viola soraria. The above plants are not included in the table or following analysis.

Table 3. Annotated Flora List of Partch Woods:

Format: Scientific name, Common name. Collection number of voucher specimen. Collection number in parentheses indicates specimen was lost before verification. (Notes on nomenclature and taxonomy). Designated "introduced" if not native to Minnesota. Community at Partch Woods. Special significance of collection, if any. Asterisk (*) if this constitutes the first collection from Stearns County in the University of Minnesota Herbarium.

I. Pteridophyta - Spore-bearing plants

Ophioglossaceae - Adder's-Tongue Family

Botrychium virginianum (L.) Sw. - Rattlesnake Fern. (#64). Maple-basswood woods.

Osmundaceae - Royal Fern Family

Osmunda claytoniana L. - Interrupted Fern Maple - basswood woods.

Polypodiaceae - Polypody Family

Adiantum pedatium L. - Maidenhair Fern. #357 Maple - basswood woods.

Athyrium Filix-femina var. michauxii mett. - Lady Fern. #638 Maple - basswood woods.

Matteuccia struthiopteris var. pensylvanica (Willd) Morton - Ostrich Fern. #434. (Pteretis pensylvanica in Fernald, 1950). Maple - basswood woods.

Onoclea sensibilis L. - Sensitive Fern. Maple - basswood woods.

Pteridium aquilinum (L.) Kuhn. - Bracken Fern #743. Maple - basswood woods.

II. Spermatophyta - Seed Plants

A. Gymnospermae - gymnosperms
B. Angiospermae - angiosperms
1. Monocotyledoneae - Monocots

Araceae - Arum Family

Arisaema triphyllum (L.) Schott. - Jack-in-the-Pulpit. #107 Maple - basswood woods.

Cyperaceae - Sedge Family

Carex gracillima Schw. - Sedge #111 Edge of path in maple-basswood woods.

Carex intumescens Pudge. - Bladder Sedge. #110
Maple - basswood woods.

Carex laxiflora var. blanda (Dewey) Boott. - Sedge #70
Maple - basswood woods.

Carex pensylvanica Lam. - Pensylvania Sedge -
Maple - basswood woods.

Carex rosea Schk. - Sedge. #63
Maple - basswood woods.

Carex sprengelii Dewey - Long-beaked Sedge. #106
Maple - basswood woods.

Gramineae - Grass Family

Hystrix patula Moench. - Bottle-Brush Grass,
#355. Edge of path in maple-basswood woods.

Muhlenbergia mexicana (L) Trin. - Mexican Satin Grass. #568
Edge of path in maple-basswood woods.

Oryzopsis spp. - Rice Grass. Maple-basswood woods

Schizachne purpurascens (Torr.) Swallen. - False Melic Grass.
#105. Maple-basswood woods.

Juncaceae - Rush Family

Luzula spp. - Wood Rush. Maple - basswood woods.

Liliaceae - Lily Family

Allium tricoccum Ait. - Wild Leek. (#226)
Maple - basswood woods.

Lilium superbum L. Turk's-Cap Lily.
Maple - basswood woods.

Maianthemum canadense Desf. - Wild Lily-of-the- Valley. Maple -
basswood woods.

Polygonatum bilflorum (Walt.) Ell. - Solomon's Seal.
Maple - basswood woods.

Polygonatum pubescens (Willd.) Pursh. - Hair
Solomon's Seal. Maple - basswood woods.

Smilacina racemosa (L.) Desf. - False Solomon's Seal. #109
Maple - basswood woods.

Smilax ecirrliata (Engelm.) Wats. - Carrion Flower. #112.
Maple - basswood woods.

Smilax herbacea L. - Carrion Flower. Maple - basswood woods.

Streptopus roseus Michx. - Twisted-Stalk. Maple -basswood woods.

Trillium cernuum L. - Wake - Robin (#62) Maple - basswood woods.

Uvularia grandiflora Sin. - Large-flowered Bellwort. (#66). Maple - basswood woods.

Uvularia sessilifolia L. - Sessile Bellwort, (#65). Maple - basswood woods.

Orchidaceae - Orchid Family

Corallorhiza trifida Chat. - Coral-Root. Maple - basswood woods.

Cypripedium calceolus L. - Yellow Lady's Slipper. Maple - basswood woods.

Habenaria spp. - Orchis. Maple - basswood woods.

Orchis spectabilis L. - Showy Orchis. Maple - basswood woods.

2. Dicotyledoneae - Dicots

Aceraceae - Maple Family

Acer negundo L. - Box Elder. Edge of maple - basswood woods.

Acer nigrum Michx. f. - Black Maple. #295. Maple-basswood woods.

Acer rubrum L. - Red Maple. Maple - basswood woods.

Acer saccharum Marsh. - Sugar Maple. (#67). Maple-basswood woods.

Anacardiaceae - Cashew Family

Rhus glabra L. - Smooth Sumac. Edge of maple - basswood woods.

Rhus radicans L. - Poison Ivy. Edge of path of maple-basswood woods.

Apocynaceae - Dogbane Family

Apocynum androsaemifolium L. - Common Dogbane. (#120). Windthrow in maple - basswood woods.

Araliaceae - Ginseng Family

Aralia nudicaulis L. - Wild Sarsaparilla. #119. Maple - basswood woods.

Aralia racemosa L. - Spikenard. #435. Maple - basswood woods.

Panax quinquefolium L. - Ginseng. (Panax quinquefolius in Fernald, 1950; Morley, 1969). Rare in Minnesota and the United States. On extreme northwest edge of range in Minnesota. Maple - basswood woods.

Aristolochiaceae - Birthwort Family

Asarum canadense L. - Wild Ginger. Maple - basswood woods.

Asclepiadaceae - Milkweed Family

Asclepias exaltata L. - Poke Milkweed. Maple - basswood woods.

Balsaminaceae - Touch-Me-Not Family

Impatiens biflora Walt. - Jewel-Weed. #358. Spring in maple - basswood woods.

Berberidaceae - Barberry Family

Caulophyllum thalictroides (L.) Michx. - Blue Cohosh. (#221). Maple-basswood woods.

Betulaceae - Birch Family

Betula lutea Michx. f. - Yellow Birch. Maple- basswood woods.

Betula papyrifera Marsh. - Paper Birch. Edge of maple - basswood woods.

Carpinus caroliniana Walt. - Blue Beech. (#224) Maple - basswood woods.*

Corylus americana Walt. - Hazel-Nut. #43. Edge of maple - basswood woods.

Ostrya virginiana (Mill.) K. Koch. - Ironwood. (#223). Maple - basswood woods.

Boraginaceae - Borage Family

Hachelia deflexa var. americana (Gray) Fern. and Johnst. - Stickseed. #567. (Hackelia americana in Fernald, 1950) Edge of path in maple - basswood woods.*

Caprifoliaceae - Honeysuckle Family

Diervilla lonicera Mill. - Bush Honeysuckle. (#220). Edge of path in maple - basswood woods.

Lonicera spp. - Honeysuckle. Maple - basswood woods.

Sambucus pubens Michx. - Red-berried Elder. Maple - basswood woods.

Triosteum perfoliatum L. - Horse Gentian. Edge of maple - basswood woods.

Viburnum rafinesquianum Schult. - Arrowwood. Maple - basswood woods.

Caryophyllaceae - Pink Family

Arenaria lateriflora L. - Sandwort. Maple - basswood woods.

Celastraceae - Staff-Tree Family

Celastrus scandens L. - Bittersweet. Maple - basswood woods.

Chenopodiaceae - Goosefoot Family

Chenopodium hybridum L. - Maple-leave Goosefoot. #572. Edge of path in maple - basswood woods.

Compositae - Composite Family

Ambrosia spp. - Ragweed. Path in maple - basswood woods.

Aster ciliolatus Lindl. - Lindley's Aster. #371. Edge of path in maple - basswood woods.

Aster lateriflorus (L.) Britt. - Calico Aster. #637. Edge of path in maple - basswood woods.

Aster macrophyllus L. - Large-leaved Aster. #566. Maple - basswood woods.

Erigeron philadelphicus L. - Daisy Fleabane. #114. Edge of path in maple - basswood woods.

Eupatorium rugosum Houtt. - Edge of spring in maple - basswood woods.

Helianthus hirsutus Raf. - Stiff-haired Sunflower. #433. Edge of path in maple - basswood woods.

Prenanthes alba L. - Rattlesnake - Root. Maple - basswood woods.

Solidago canadensis L. - Canada Goldenrod. #803. Windthrow in maple - basswood woods.*

Solidago flexicaulis L. - Zig-Zag Goldenrod. #410. Maple - basswood woods.

Taraxacum officinale Weber. - Dandelion. Introduced. Path in maple - basswoods woods.

Cornaceae - Dogwood Family

Cornus alternifolia L. f. - Pagoda Dogwood. #115. Maple - basswood woods.

Cornus racemosa Lam. - Gray-barked Dogwood. Edge of maple - basswood woods.

Cornus stolonifera Michx. - Red Osier Dogwood. #216. Windthrow in maple - basswood woods.

Ericaceae - Heath Family

Pyrola asarifolia Michx. - Pink Pyrola. (#227) Maple - basswood woods.

Pyrola elliptica Nutt. - Shinleaf. #746. Maple - basswood woods.

Fabaceae - Bean Family

Amphicarpa bracteata (L.) Fern. - Hog-Peanut #571. Maple - basswood woods.

Desmondium glutinosum (Muhl.) Wood. - Pointed-leaved Tick-Trefoil. #353. Maple - basswood woods.

Fagaceae - Beech Family

Quercus alba L. - White Oak. Maple - basswood woods.

Quercus borealis Michx. f. - Northern Red Oak. #573. Maple - basswood woods.

Quercus macrocarpa Michx. - Bur Oak. #805. Maple - basswood woods.

Geraniaceae - Geranium Family

Geranium maculatum L. - Wild Geranium. #118. Maple-basswood woods.

Oleaceae - Olive Family

Fraxinus nigra Marsh. - Black Ash. #745. Maple - basswood woods.*

Fraxinus pennsylvanica Marsh. - Green Ash. Maple - basswood woods.

Onagraceae - Evening-Primrose Family

Circaea alpina L. - Smaller Enchanter's Nightshade. #806. Edge of spring in maple - basswood woods.

Circaea quadrisulcata (Maxim.) Franch. and Sav. Enchanter's Nightshade. #356. Maple - basswood woods.

Papaveraceae - Poppy Family

Sanguinaria canadensis L. - Bloodroot. #108. Maple - basswood woods.

Phrymaceae - Lopseed Family

Phryma leptostachya L. - Lopseed. #345. Maple - basswood woods.

Plantaginaceae - Plantain Family

Plantago rugelii Decne. - Plantain. #570. Path in maple - basswood woods. *.

Ranunculaceae - Crowfoot Family

Actaea rubra (Ait.) Willd. - Red Baneberry. #639. Maple - basswood woods.

Anemone quinquefolia L. - Wood Anemone. Maple - basswood woods.

Aquilegia canadensis L. - Columbine. #116. Maple - basswood woods.

Hepatica americana (DC.) Ker. - Hepatica. Maple - basswood woods.

Ranunculus abortivus L. - Small-Flowered Crowfoot. (#69.) Path in maple - basswood woods.

Ranunculus recurvatus Poir. - Hooked Buttercup. Maple - basswood woods.

Thalictrum dioicum L. - Early Meadowrue. (#68) Maple - basswood woods.

Rosaceae - Rose Family

Agrimonia striata Michx. - Agrimony. #436. Edge of path in in maple - basswood woods.*

Amelanchier laevis Wieg. - Juneberry. Maple - basswood woods

Fragaria virginiana Duchesne. - Strawberry
Maple - basswood woods

Geum aleppicum var. strictum (Ait.) Fern. Yellow Avens. #219 . Maple - basswood woods.

Geum canadense Jacq. - White Avens. (#222). Edge of path in maple - basswood woods.

Prunus serotina Ehrh. - Black Cherry. Maple - basswood woods.

Prunus virginiana L. - Choke Cherry. Maple - basswood woods.

Rosa spp. - Rose. Edge of path and windthrows in maple - basswood woods.

Rubus strigosus Michx. - Red Raspberry. #104. Windthrows in maple - basswood woods.*

Rubiaceae - Madder Family

Galium triflorum Michx. - Fragrant Bedstraw (#225). Maple - basswood woods.

Rutaceae - Rue Family

Zanthoxylum americanum Mill. - Prickly Ash. #431. Maple - basswood woods.

Salicaceae - Willow Family

Populus grandidentata Michx. - Large-toothed Aspen. #426. Maple - basswood woods.

Populus tremuloides MIchx. - Quaking Aspen. #835. Maple - basswood woods.

Salix spp. - Willow. Maple - basswood woods.

Saxifragaceae - Saxifrage Family

Ribes cynosbati L. - Dogberry. Maple - basswood woods.

Solanaceae - Nightshade Family

Solanum nigrum var. virginicum L. - Black Nightshade. #640. Maple - basswood woods.

Thymelaeaceae - Mezereum Family

Dirca palustris L. - Leatherwood. Maple - basswood woods.

Tiliaceae - Linden Family

Tilia americana L. - Basswood. #354. Maple - basswood woods.

Ulmaceae - Elm Family

Ulmus americana L. - American Elm. Maple-basswood woods

Umbelliferae - Parsley Family

Cryptotoenia canadensis (L.) DC. - Honewort. (#218). Maple - basswood woods.

Osmorhiza claytoni (Michx.) Clarke - Sweet Cicely. (#217). Maple - basswood woods.

Osmorhiza longistylis (Torr.) DC. - Anise-Root (#61). Maple - basswood woods

Sanicula marilandica L. - Black Snakeroot. #117. Maple - basswood woods.

Zizia aurea (L.) Koch. - Golden Alexander. Maple - basswood woods.

Violaceae - Violet Family

Viola cucullata Ait. - Blue Marsh-Violet. Maple - basswood woods.

Viola pubescens Ait. - Downy Yellow Violet. #113. Maple - basswood woods.

Vitaceae - Grape Family

Parthenocissus spp. - Virginia - Creeper. Maple - basswood woods.

Vitis spp. - Wild Grape. Edge of maple - basswood woods.

Observations of the site's phenology were begun after 27 May 1977. Due to this late beginning only twenty-nine forb species, 40% of the tract's total number of forb species, were recorded in flower. Therefore, 60% of Partch Woods' total number of flowering forbs were spring bloomers - typical of a maple-basswood forest. Table 4 and Figure 8 record when Partch Woods' forbs flowered in 1977. Although the peak blooming date appeared to be 8 August, when fifteen species were in flower, the peak in fact probably occurred before the inventory began in early spring.

Significance of Partch Woods' Flora

Partch Woods' flora is significant in that most of the species present on the site are indigenous to Minnesota. Only a few weedy pioneer species were present on the main trail. Thus Partch Woods' flora is relatively undisturbed.

One plant species classified as rare in mature forest habitats was identified in Partch Woods: Ginseng (Panax quinquefolium). The species is at the extreme northwestern edge of its range in Minnesota. Only twenty-two specimens have been collected and deposited in the University of Minnesota Herbarium. Dr. Tom Morley and Mark Heitlinger have classified this species as rare in Minnesota, while Dr. John Moyle classified Ginseng as a species of special interest, meriting special consideration. In adjacent states Ginseng is listed as - rare in Iowa, rare and endangered in South Dakota, and threatened in Wisconsin. Twenty-one other states classify the species as rare, threatened, endangered, depleted, possibly extinct, special or protected. (Kartesz and Kartesz, 1977). In addition, Ginseng is presently under U.S. Fish and Wildlife Service review to determine whether it qualifies as a nationally endangered or threatened species.

From a scientific and educational viewpoint the area is significant because it presents an opportunity for studying native flora and life

Table 4. Flowering periods of vascular plant species found at Partch Woods in 1977.

Dates indicate the beginning and end of flowering period.

Species	
Aquilegia canadensis	27 May - 6 June
Aralia nudicaulis	- 27 May
Geranium maculatum	27 May - 6 June
Osmorhiza longistylis	- 27 May
Sanicula marilandica	27 May - 14 June
Smilacina racemosa	- 27 May
Apocynum androsaemifolium	6 June - 14 June
Erigeron philadelphicus	6 June - 5 July
Allium tricoccum	14 June - 24 June
Cryptotaenia canadensis	14 June - 19 August
Galium triflorum	14 June - 16 July
Geum canadense	14 June - 25 July
Pyrola asarifolia	14 June - 24 June
Circaea quadrisulcata	24 June - 8 August
Desmodium glutinosum	24 June - 8 August
Impatiens biflora	24 June - 10 September
Phryma leptostachya	24 June - 8 August
Agrimonia striata	5 July - 19 August
Aralia racemosa	5 July - 16 July
Hackelia deflexa var. *americana*	5 July - 25 July
Helianthus hirsutus	5 July - 8 August
Aster macrophyllus	16 July - 10 September
Amphicarpa bracteata	16 July - 30 August
Aster lateriflorus	25 July - 10 September
Solidago flexicaulis	25 July - 10 September
Solanum nigrum	25 July - 19 August
Aster ciliolatus	1 August - 10 September
Eupatorium rugosum	8 August - 10 September
Solidago canadensis	8 August - 30 September

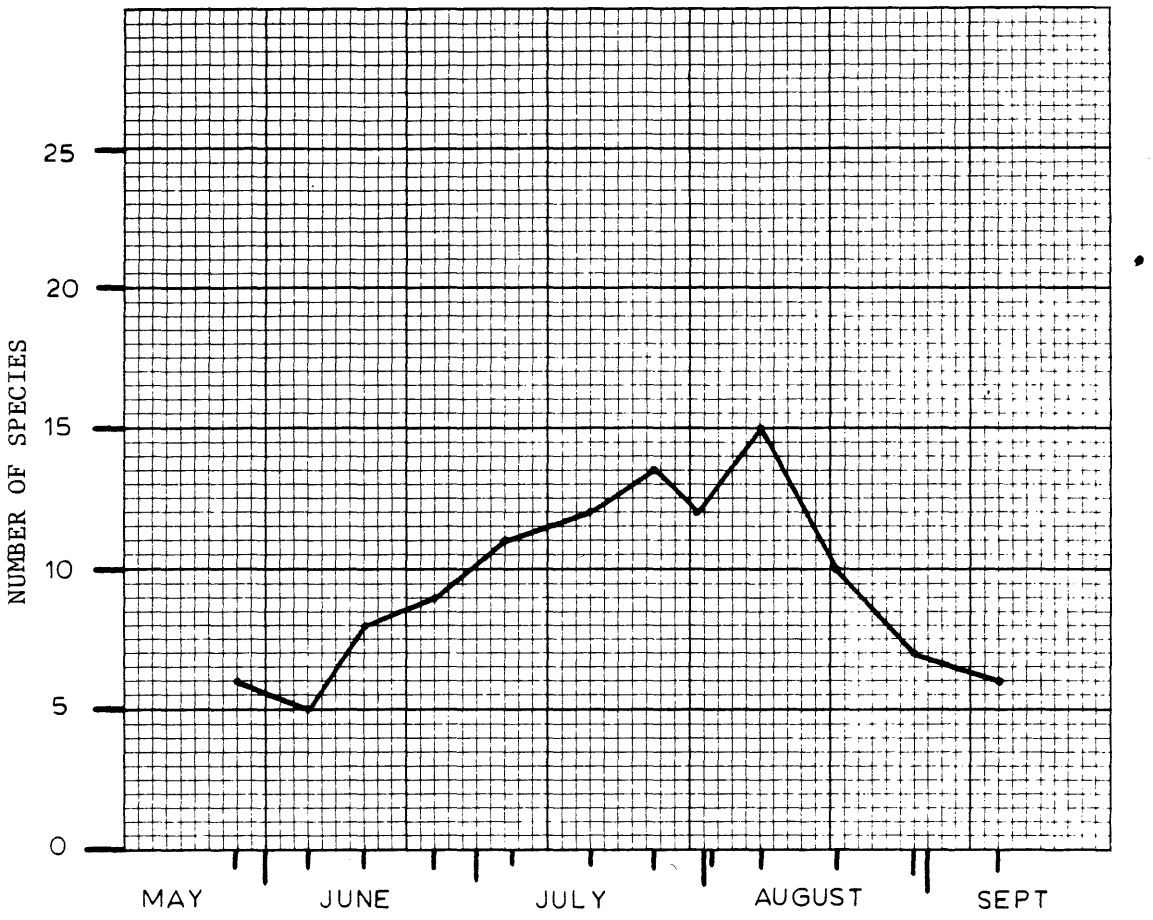

Figure 8. Numbers of flowering plant species observed in Partch Woods. Observations were recorded from 27 May to 10 September 1977.

history ecology of many plant species which occur in a maple-basswood forest.

Additional Research/Inventory Needs

Although a fairly complete record of Partch Woods' vascular flora is now on hand the 1977 inventory did not thoroughly survey the area's non-vascular plants. A survey of the non-vascular plants, such as the mosses and lichens, could be done. Also research should be done on how to perpetuate and propagate the Ginseng populations. Finally, the tract's spring flora phenology should be recorded.

Sources of Information

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Kartesz, John T. and Rosemarie Kartesz. 1977. The Biota of North America. Part 1: Vascular Plants. Volume 1: Rare Plants. BONAC, Pittsburgh, Pa. 361 pp.

BUTTERFLIES[1]

Butterflies are found in virtually all of Minnesota's natural areas. They are insect herbivores which feed on and polinate plants, and affect plant distribution and abundance. Butterflies as primary consumer provide sustenance for consumers higher up on the food chains. A butterfly inventory is necessary to document an area's natural diversity, to identify rare species needing special protection, and to gain a better understanding of many species which are poorly known. Finally, some butterflies are sensitive ecological indicators, providing useful information on changes which may occur on the unit.

Methods

In 1977 a detailed inventory of Partch Woods' butterflies was carried out.[2] Biweekly visits were made to the site from the second week in May to the second week in September. The first intensive butterfly sampling, however, was done during the final week in June with follow-up visits made during hours when weather conditions were favorable to butterfly activity. Sampling was focused on the main trail, beginning in the northeast corner of the unit. Other sampling was guided principally by the researcher's expectation of significant butterfly activity.

Observations of adult and immature butterflies were recorded together with the location, habitat type, and associated plant species. A rough estimate of each species' frequency was also made. Butterflies were usually

1 The term butterflies, here, refers both to the true butterflies (Papilionaceous) and the Skippers (Hesperiodea).

2 A more detailed report of this study is on file, The Nature Conservancy, Minnesota Chapter. The researcher also inventoried the 40 acre parcel adjoining the unit which may become part of the tract. This data is not included here however. The assistance provided by Mr. Ron Huber, Zoology Assistant with the Science Museum of Minnesota, is gratefully acknowledged.

identified by sight, but a standard butterfly net was employed to capture the insects for identification when necessary. All captured insects were released except when reliable identification required a prepared specimen, or when a voucher specimen was desired. All specimens were deposited in the Department of Entomology, Fisheries and Wildlife collection, University of Minnesota, St. Paul.

Scientific names used here are taken from Huber (1975), with the addition of some subspecific names based on Howe (1975). Subspecific names are given only when the populations could clearly be assigned to a subspecies other than the nominate. In unclear classes the subspecific name is followed by "ssp" ("subspecies").

Butterflies of Partch Woods

Table 3 is an alphabetical list of the butterflies observed on the unit and within half a mile of the area in 1977. Ten species were identified in Partch Woods. All of the species are widespread and generally are common to this area. None require undisturbed habitat and most, in fact, thrive on moderate disturbance. Two widespread and common satyrids, the Pearly Eye and the Little Wood Sattr, could be regarded as the most characteristic butterflies of the area, though neither is restricted to mature deciduous forest. Virtually all of the other butterflies recorded on the unit depend upon openings, edges, young successional woods, etc., for at least part of their life cycle.

Two meadow butterflies, the Silvery Checkerspot and the Great Spangled Fritillary were included in the ten species observed. The Silvery Checkerspot was probably a vagrant wandering into the forest along the paths, while the Great Spangled Fritillary perhaps was utilizing woodland violets as larval host plants.

Table 5. Butterflies Identified in Partch Woods in 1977.[1]

Celastrina argiolus pseudargiolus	(Spring Azure)
(Cercyonis pegala ssp.	(Wood Nymph))
Chlosyne nycetis	(Silvery Checkerspot)
(Colias eurytheme	(Alfalfa Butterfly))
(Colias philodice	(Common Sulphur))
Euptychia cymela	(Little Wood Satyr)
(Euphyes vestris metacomet	(Dun Skipper))
Lethe anthedon	(Pearly Eye)
(Lethe appalachia leeuwi	(Appalachian Brown))
(Lethe eurydice ssp.	(Eyed Brown))
(Limenitis arthemis ssp.	(Banded Purple)
Nymphalis antiopa	(Mourning Cloak)
(Nymphalis milberti	(Milbert's Tortoiseshell))
Nymphalis vau-album j-album	(Compton's Tortoiseshell)
(Phyciodes tharos	(Pearl Crescent))
Polygonia comma	(Comma)
(Polygonia progne	(Gray Comma))
(Satyrium acadica	(Acadian Hairstreak))
Satyrium liparops ssp.	(Striped Hairstreak)
Speyeria cybele	(Great Spangled Fritillary)
Vanessa atalanta rubria	(Red Admiral)

1. Species enclosed in parentheses were not recorded on the preserve, but were identified within one-half mile of it.

Sources of Information

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BIRDS

Birds are another element which adds to the natural diversity of an area and the state. Indeed, there are more bird species than all other vertebrates in Partch Woods. An inventory is needed to record species diversity, identify endangered, rare, or sensitive species and recognize changes in species composition.

Methods

A bird census was made by walking through the area on various occasions from the end of May through September, 1977. Birds were identified by sight, sound, or a combination thereof. Identification was aided by the use of a bird field guide and binoculars.

Partch Woods' Birds

Thirty bird species were identified on or over Partch Woods during the 1977 inventory. Virtually all of the birds are residents of forests throughout the state. Table 6 lists the birds in phylogenetic order.[1]

Additional Inventory/Research Needs

Due to a limited field season the 1977 bird inventory may be incomplete. Also, the inventory did not distinguish if the birds nested on the unit.

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1 Location and dates birds were observed are on file, The Nature Conservancy, Minnesota Chapter.

Table 6. Birds identified in Parch Woods in 1977.

Accipiter cooperii (Cooper's Hawk)
Buteo jamaicensis (Red-tailed Hawk)
Bonasa umbellus (Ruffed Grouse)
Coccyzus erythropthalmus (Black-billed Cuckoo)
Strix varia (Barred Owl)
Archilochus colubris (Ruby-throated Hummingbird)
Colaptes auratus (Common Flicker)
Dryocopus pileatus (Pileated Woodpecker)
Dendrocopos pubescens (Downy Woodpecker)
Myiarchus crinitus (Great Crested Flycatcher)
Empidonax minimus (Least Flycatcher)
Contopus virens (Eastern Wood Pewee)
Cyanocitta cristata (Blue Jay)
Corvus branchyrhynchos (Common Crow)
Parus atricapillus (Black-capped Chickadee)
Sitta carolinensis (White-breasted Nuthatch)
Dumetella carolinensis (Gray Catbird)
Turdus migratorius (American Robin)
Hylocichla mustelina (Wood Thrush)
Vireo flavifrons (Yellow-throated Vireo)
Vireo olivaceus (Red-eyed Vireo)
Dendroica cerulea (Cerulean Warbler)
Seiurus aurocapillus (Ovenbird)
Geothlypis trichas (Common Yellowthroat)
Setophaga ruticilla (American Redstart)
Icterus galbula (Northern Oriole)
Piranga ludoviciana (Scarlet Tanager)
Pheucticus ludovicianus (Rose-breasted Grosbeak)
Passerina cyanea (Indigo Bunting)
Spinus tristis (American Goldfinch)

thus a more detailed bird inventory could be carried out to fill in these gaps.

Sources of Information

Burton, Charles. 1969. The Ecology of a Small Population of Ruffed Grouse. Bonasa Umbelius (Linnaeus) in a Northern Hardwood Forest. Ph.D. thesis. University of North Dakota, Grand Forks.

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MAMMALS

Mammals must be inventoried to 1) record the unit's natural diversity; 2) identify rare or sensitive species; and 3) to obtain baseline data so changes in species composition can be discerned.

Methods

Small mammals were censused using eighty live-traps placed on two parallel lines set fifty feet apart. Each line consisted of twenty stations set at intervals of fifty feet. Each station contained a 2x2x6 Sherman live trap and a Longworth live trap. A peanut butter-oatmeal mixture was used to bait the traps. The end stations of the southern trapline were on the line separating acres 6, 16, and 26 from acres 7, 17, and 27 on Professor Max Partch's grid. The western ends of the traplines abutted the tract's border. The traps were all set on 21 July 1977 and were checked at approximately 7:10 P.M. that evening, 7:55 A.M. and 7:13 P.M. on 22 July, and 7:10 A.M. on 23 July, at which time they were pulled. Reference specimen were taken and study skins prepared. Specimens were deposited in the James Ford Bell Museum of Natural History, University of Minnesota, Minneapolis.

Large mammals were censused only through direct or indirect observation during the bird census.

Partch Woods' Mammals

Six mammal species were identified by trap, tracks or visually in Partch Woods. In addition, the fox squirrel was reported to be present by a local resident. Table 7 lists the species recorded in alphabetical order.[1]

Table 7. Mammals identified in Partch Woods.

Clethrionomys gapperi (Red-backed Vole)
Odocoileus virginianus (Whitetail Deer)
Peromyscus leucopus (White-footed Mouse)
Sciurus carolinensis (Grey Squirrel)
Sciurus niger (Fox Squirrel)
Tamias striatus (Eastern Chipmunk)
Tamiasciurus hudsonicus (Red Squirrel)

Sources of Information

Gunderson, Harvey L. and James R. Beer. 1953. The Mammals of Minnesota. University of Minnesota Press, Minneapolis.

LAND USE HISTORY

Virtually all "natural areas" have been affected to some degree by the past activities of people. Farming, grazing, logging, hunting, drainage of wetlands, and the prevention of fire are some of the ways people have affected the land. Knowledge of historical land use practices helps explain the present condition of the land and its resources, and the origin of human impacts on the area. Surrounding land use practices affect the viability of all natural areas.

1 The location, dates and number of mammals recorded on the tract are on file The Nature Conservancy, Minnesota Chapter.

Methods

Most of the land use information presented here is based on information in The Nature Conservancy, Minnesota Chapter files and on an interview with Professor Max Partch, a former owner.

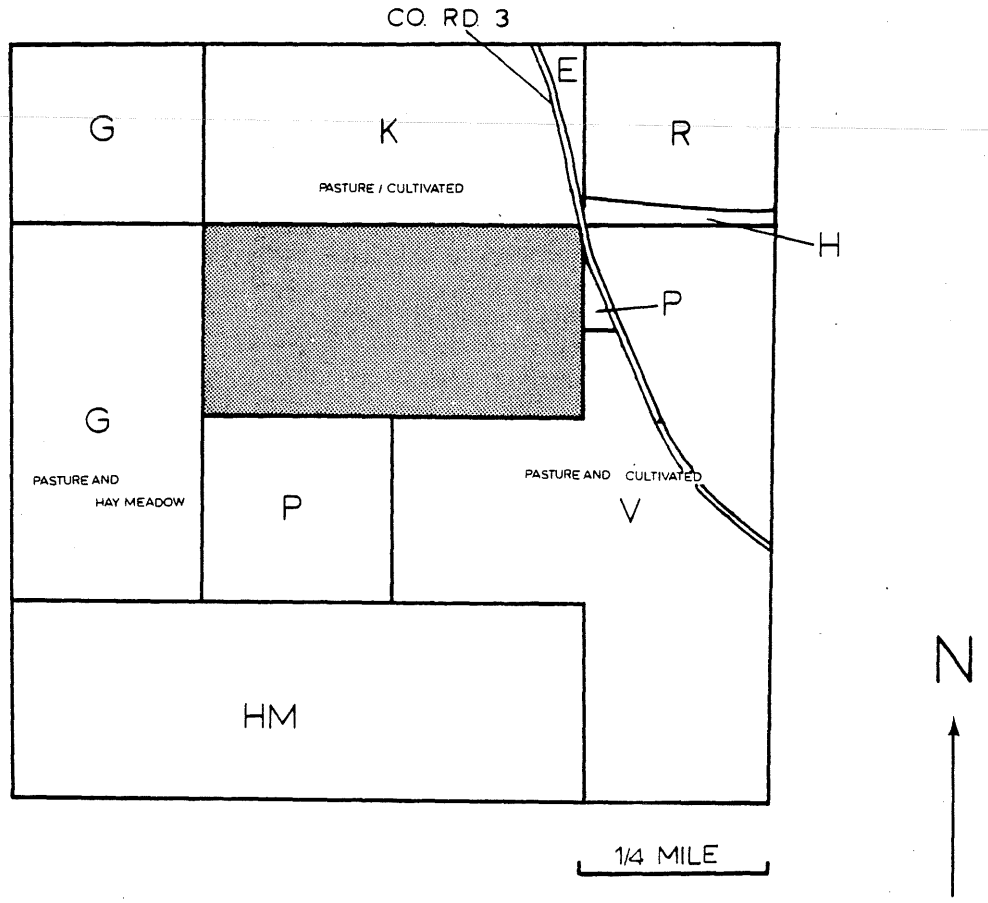
Recent Land Use History[1]

The St. Cloud region was first settled by Europeans in the middle of the nineteenth century. Most of the land was cleared for farming and grazing, or used for timber production. Today Partch Woods is surrounded by cultivated fields and pastures. Figures 9 and 10 indicate the owners and land uses adjacent to the tract.

Partch Woods itself has not been greatly disturbed by past human activities. Near the center of the unit are several wagon loads of stones which looks like they might have been collected from an open field and hauled there. Northeast of the pile there may have been an open disturbed area in which aspen trees are now growing.

Although Partch Woods has never been pastured it has been selectively logged: in 1896 several acres along the northern border were selectively logged by the owner, a Mr. Sauer (See Figure 11). No more logging was done until 1957 when the land was bought by Lovell S. Daniels and Ralph J. Kemp, owners of a lumber company in Birchwood, Wisconsin. A total of 110,000 board feet of prime veneer logs were cut, including 40,000 board feet of basswood, 25,000 board feet of hard maple, 25,000 board feet of red oak, and 20,000 board feet of ash, birch and elm. A maze of logging roads and clearings were left in the woods. These paths and clearings are now growing shut (See Figure 11).

1 Information was also gathered on the adjacent south forty acre parcel which eventually may be transferred to the tract. This information is not included in this document however. It is on file, The Nature Conservancy, Minnesota Chapter.



KEY

E Marvin W. & Elaine Kremers (3.2 acres)

G Leonard Gondringer, Rt. 2, Avon, MN 56310 (38.37 & 77.4 acres)

H Robert T. & Jane I. Heuru, Rt. 2, Avon, MN 56310 (5 acres)

HM Amor J. & Lorraine A. Himsl, Rt. 2, Avon, MN 56310 (110.75 acres)

K Arnold C. Kremers, Rt. 2, Avon, MN 56310 (76.8 acres)

P Max L. Partch, 513 S. 7th St., St. Cloud, MN 56310 (4& 40 acres)

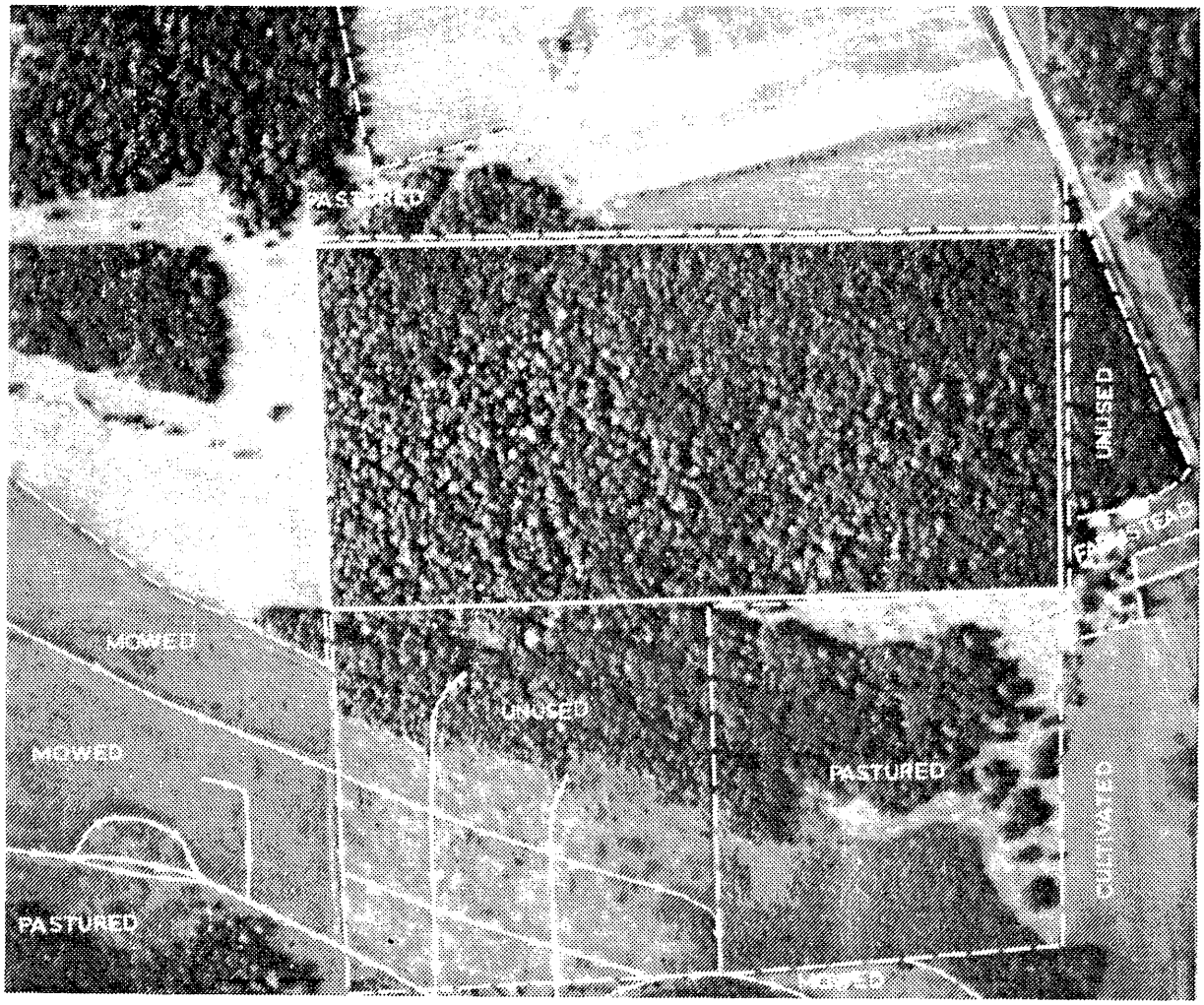
R John J. and Barbara Riesner (35 acres)

V Gerald R. & Janice Vogt, Rt. 2, Avon, MN 56310 (156 acres)

County Road 3

PARTCH WOODS

Figure 9. Landowners and land uses adjacent to Partch Woods. Names and addresses are from the Stearns County Assessor's records as of 7 July 1977.



N

KEY

Partch Woods Boundary

Fences and Field Boundaries

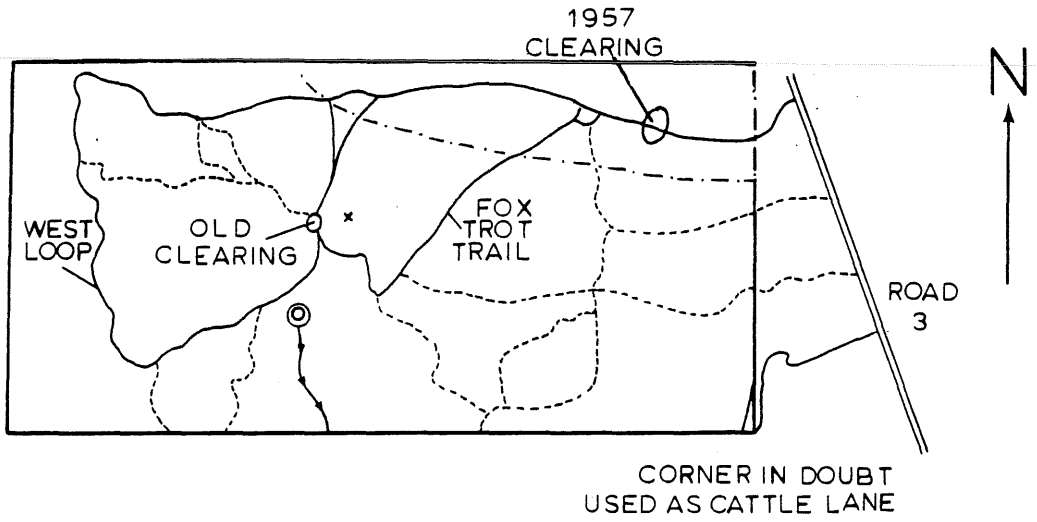
Driveway

Drainage Ditch

House

SCALE: 8":1 MILE

Figure 10. Land uses adjacent to Partch Woods. The aerial photograph was taken in 1976.



KEY

◎ Source of the seepage spring

× Pile of rocks

——— Present trails

------ Overgrown trails

— · — · — Approximate south boundary of 1896 logging

→→ Creek

SCALE: 8":1 MILE

Figure 11. General features of Partch Woods including trails and other landscape modifications.

The logging explains some of the species and age differences in the trees.

History of Preservation Efforts

Partch Woods has remained a natural area thanks largely to the efforts of one individual. In 1957 Dr. Max Partch first learned of a hardwood "virgin forest" near St. Joseph. Amazed by the forest and convinced of the need to preserve it, Dr. Partch first attempted to obtain funds from the then Minnesota Department of Conservation and the Minnesota Academy of Sciences to purchase the land.[1] Unable to raise the necessary funds, Dr. Partch was helpless to stop the owners from selectively logging the area in the spring of that year. In spite of the logging Dr. Partch was still convinced the stand was unique and worthy of preservation. To prevent more logging he borrowed the necessary $2500 himself and bought the eighty acre woods together with a tamarack bog and meadow in an adjoining forty acres in March, 1958.

The eighty acre forest was given to The Nature Conservancy by the Partches in four separate parcels from 1965 through 1968.

Sources of Information

Bruton, Charles. 1969. The Ecology of a Small Population of Ruffed Grouse. Bonasa Umbelius (Linnaeus) in a Northern Hardwood Forest. Ph.D. thesis. University of North Dakota, Grand Forks.

Partch, Max. 1966. A plea for the preservation of Minnesota's natural areas. Conservation Volunteer 29 (170): 22-28.

NATURAL AREA VISITORS

Knowledge of the number of visitors and visitor characteristics is necessary to determine who is using the natural area and what problems,

1 The Minnesota Chapter of The Nature Conservancy didn't exist at that time.

(if any) are being caused by various user groups. Potential users should also be identified to help predict future trends, problems, and management actions which may be required.

Visitors were not surveyed in the 1977 inventory, nor were potential users examined. Therefore, no information is presented here on the area's present users and their characteristics.[1]

Many potential users exist for Partch Woods. Due to its close proximity to St. Cloud, a large increase in use could occur when certain segments of the population become aware of the area. Two universities, St. Cloud State and St. John's University in Collegeville and one college, the College of St. Benedict in St. Joseph, are within a half hour drive of the area and could use the site for educational and research purposes. (St. Cloud State University already uses the site.) Eighteen public middle and secondary schools in Stearns County plus schools in Benton and Morrison Counties might utilize the area for environmental education purposes. Some users might also come up from the Twin Cities area, which is about one and one half hours driving time from the site.

1 Some information on user numbers has begun to be collected from registration sign-up sheets at the site. This information is on file, The Nature Conservancy, Minnesota Chapter. In 1978 Dr. Partch estimated that less than one hundred individuals visited the area, including school groups, scientists, and recreationists.