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FINAL REPORT U.S. DEPARTMENT OF COMMERCE NOAA
COASTAL SERVICES CENTER
2234 SOUTH HOBSON AVENUE
CHARLESTON, SC 29405-2413
COASTAL ENERGY IMPACT PROGRAM
Contract Number 79-16

Biological Inventory of the Coastal Zone in Lucas,
Wood, Ottawa, Sandusky, Erie, Lake, and Ashtabula
Counties to Determine Locations of Significant
Plant Species, Plant Communities and Natural Areas
which are Threatened Due to New or Expanding Energy
Facilities or Activities

Submitted to:

Ohio Department of Energy
Coastal Energy Impact Program
30 East Broad Street, 34th Floor
Columbus, Ohio 43215

By:

Ohio Department of Natural Resources
Division of Natural Areas and Preserves
Fountain Square, Building F
Columbus, Ohio 43224

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December 28, 1979

PROJECT STAFF

Ohio Department of Natural Resources
Division of Natural Areas and Preserves

Dennis M. Anderson - Research Coordinator
Robert J. Bartolotta - Field Botanist
Anne R. Bearss - Data Processing
David M. Brandenburg - Field Botanist
Allison W. Cusick - Field Botanist Coordinator
Anne R. Filbert - Data Processing
Erin K. Flavin - Data Collection
Laura N. Hood - Field Botanist
Patricia D. Jones - Data Systems Supervisor
Susan E. Lavery - Secretary
John H. Marshall - Field Research
Robert M. McCance, Jr. - Project Administrator
Sandra L. McCoy - Data Processing
Patricia A. Semans - Data Processing

ACKNOWLEDGMENTS

The Ohio Department of Natural Resources, Division of Natural Areas and Preserves, wishes to thank the staff of the Ohio Department of Energy for the assistance they provided in the implementation of this project. In addition, this project would not have been possible without the support and cooperation of the Ohio Coastal Zone Management Section. Special thanks are due to the many landowners who granted permission for Division staff to survey their property.

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INTRODUCTION

The Coastal Energy Impact Program (CEIP), created by a 1976 amendment to Section 308 of the U.S. Coastal Zone Management Act of 1972, is a federally funded program designed to assist coastal states and units of local government in mitigation of on-shore effects of new or expanding coastal energy activity. The Ohio Department of Energy has responsibility for development, implementation, and administration of Section 308 CEIP within the State of Ohio.

On July 1, 1979, the Ohio CEIP provided a Planning Grant of \$22,294 in federal funds to the Division of Natural Areas and Preserves (DNAP). Planning grants are awarded on an 80% federal/20% non-federal funding basis. These grants may be used to defray costs of study and planning for economic, environmental, or social impacts occurring or likely to occur in the coastal zone as a result of the siting, construction, expansion, or operation of new (since July 26, 1976) or expanded energy facilities.

Planning Grant Contract Number 79-16 funded a biological inventory of the coastal zone in Lucas, Wood, Ottawa, Sandusky, Erie, Lake and Ashtabula counties to determine locations of significant plant species, plant communities and natural areas which are threatened due to new or expanding energy facilities or activities. The DNAP will use this information to develop programs and strategies for the protection of the most significant natural features so identified. Information gathered through this project also is available to concerned entities through the Division's natural heritage data services program. This additional data may now be used for environmental assessment and to determine locations for energy activities and facilities which will minimize adverse impacts to these significant environmental resources.

As originally proposed, the field survey portion of this project would

have been initiated on June 18, 1979. Although spring and early summer plant species would be missed, this was the earliest possible date on which the CEIP staff felt that formal project approval could be given. Due to difficulties encountered in acquiring formal state and federal approval, DNAP was not authorized to initiate the project until August 6, 1979. Thus this project is a two rather than three season survey of the Lake Erie coastal zone. Additional research in the spring is necessary to complete an inventory of the rare plants and significant plant communities of the coastal zone.

The project consisted of three parts. First, existing information was collected and evaluated. This information included herbarium specimens and records, existing heritage program data, and pertinent written reports. In the second part of the project, heritage program staff, assisted by three temporary employees, conducted field surveys in all the coastal zone counties excluding Cuyahoga and Lorain, which were not included in the study because of funding limitations. In the third part of the project, this data was processed and evaluated by employees of the DNAP central office. Regular DNAP staff coordinated the project, evaluated the resulting data, and prepared the final report.

This final report is intended to provide information concerning the inventory methodology, data availability and general protection strategy. This report does not provide details about rare plant occurrences, relative quality or location of the most significant plant communities or natural areas, or Division strategy for future preservation efforts of specific sites. Accurate, detailed information can be provided to legitimate data users through the Natural Heritage Program data services. This system will provide the user with the most current information available.

DATA COLLECTION SYSTEM

Data on endangered species and significant natural plant communities in the Lake Erie coastal zone were obtained from all major available sources to the level of detail allowed by funding and time limitations of the contract. Data sources included herbarium specimens, literature records, knowledgeable individuals, and original field work. These data were organized by the data processing systems of the Natural Heritage Program within the Ohio Department of Natural Resources, Division of Natural Areas and Preserves.

Most of the preexisting endangered species data pertaining to the Lake Erie coastal zone had been obtained by the Natural Heritage Program prior to work on the CEIP contract. These data were refined, updated and reorganized to assist field survey efforts on the project and to make the data more useful to the Division. Attempts then were made to validate these records in the field.

Most of the new or improved data obtained by the Division of Natural Areas and Preserves was a result of the efforts of the field botanists. Mr. David Brandenburg worked full time on the western basin (Lucas to Erie counties) from the approved starting date of the project until August 24. Mr. Robert Bartolotta, working part-time on the project from the starting date until October 19, concentrated his efforts on Ashtabula County, with some work in Lake County. Ms. Laura Hood, working full-time on the project from the starting date until October 19, concentrated her efforts on Lake County in August, and on the western basin in September and October. These people were assisted by Mr. Allison Cusick, field botanist coordinator, and by Mr. John Marshall of the Natural Heritage Program staff.

Confronted with the formidable task of surveying as much of the coastal zone as possible, the field botanists concentrated on areas where previous records, literature and personal leads, probable habitats, and intuition directed them. Their primary goal was the location of endangered plant species, with possibly significant plant community stands being recorded when encountered. Specimens of State proposed endangered, threatened, and potentially threatened species were obtained when populations were large enough to warrant collection. Specimens were deposited primarily at the herbarium of The Ohio State University, with duplicates, when collected, usually being deposited at Kent State University and/or Miami University. Sight records (versus collection records) were made for very small populations and for populations of species already represented by adequate collections in given areas.

All endangered species occurrence data were organized by the Natural Heritage Program data processing system. Each record was checked for completeness and accuracy of information, and then mapped and entered into computer storage. Such storage will allow easy access to, alteration of, and addition to the data contained on the Lake Erie coastal zone.

SURVEY RESULTS

The Lake Erie coastal zone contains numerous locations of state endangered and threatened plants, as well as many significant plant communities and natural areas. Previous data collection efforts in the coastal zone have been extensive when compared to efforts in other parts of the state, yet there are a number of areas which have not been adequately surveyed. This project provided an opportunity for the Division of Natural Areas and Preserves to verify older data and to improve upon vague or inaccurate information.

Many previously known locations of rare plants were surveyed and verified as a result of this project. Older records were updated, improved and reconfirmed. New locations for rare plants were discovered and better population data was obtained on known sites. It is not possible to give exact statistics on the number of new rare plant occurrences identified as a result of this project because it is not always possible to determine whether an old vague record is being updated and improved, or whether a previously unreported occurrence has been discovered.

Research efforts in the coastal zone as a result of the CEIP contract resulted in 161 new and/or improved records of rare plant occurrences being added to the Natural Heritage Program data base, which now contains approximately 4,600 rare plant occurrences. An estimated 40% of these new records could be considered as previously undocumented occurrences because they do not occur in close proximity to documented occurrences.

A list of the rare plants of Ohio is attached as Appendix B of this report. Of the 565 species listed as endangered, threatened, or potentially threatened, an estimated 210 occur or could potentially occur in the Lake Erie coastal zone. It is not possible at this time to provide an authoritative list of

the rare plants of the coastal zone. With additional field survey work in the spring and further data analysis, it should be possible to develop such a list in early 1981.

Many of the rare plants of the coastal zone will be proposed for official state endangered and threatened status in 1980. This list of rare species can be used as a tool for conducting environmental assessments and reviewing environmental impact statements for proposed projects in the coastal zone.

TABLE 1. SPECIAL PLANT OCCURRENCES BY COUNTY

<u>County</u>	<u>Total occurrences from CEIP research</u>	<u>Species Total</u>
Ashtabula	52	23
Lake	27	11
Cuyahoga	3	3
Lorain	2	2
Erie	25	11
Sandusky	0	0
Ottawa	49	20
Wood	0	0
Lucas	3	3

The 161 records from the CEIP research represent data on 39 plant species. Ashtabula County had the highest number of new plant occurrences (52) and the most species (23). No new information was collected from Sandusky or Wood counties. The field botanist made brief stops in Lorain and Cuyahoga counties

while travelling between the eastern and western counties. These surveys provided five plant occurrences.

Thirteen of the 39 plant species are represented by only one new occurrence. Ten plants are represented by two occurrences. One plant, Cakile edentula var. lacustris, was represented by 33 occurrences. Upon further study, it may be removed from the potentially threatened list because of the new data provided by the CEIP project. Three of the 39 species will be proposed for state endangered status and 18 will be proposed for threatened status. The 18 remaining species are currently listed as potentially threatened.

It is important to note that these data only represent the new and/or improved records of plant occurrences. The Natural Heritage Program has a great deal of information from the coastal zone which should be taken into consideration when planning for energy facilities or other types of development in the Lake Erie coastal zone.

FEDERALLY LISTED SPECIES

Ohio is known to have or have had 20 plant species listed by the U.S. Fish and Wildlife Service in the Federal Register as official, proposed or petitioned endangered or threatened species. Although some of these species have been "delisted" as a result of their having been listed in a proposed status past the maximum allowable 2-year period, this in itself does not decrease their biological status as possible national endangered or threatened species. Such species may be repropose as Federal endangered or threatened species in due time.

The 20 Ohio species are:

Aconitum noveboracense - Threatened
Asplenium ebenoides - Petitioned threatened
Asplenium kentuckiense - Petitioned threatened
Calamagrostis insperata - Petitioned endangered
Cypripedium candidum - Petitioned threatened
Muhlenbergia curtisetosa - Petitioned threatened
Panax quinquefolius - Petitioned endangered or threatened
Plantago cordata - Delisted
Platanthera flava - Petitioned threatened
Platanthera leucophaea - Petitioned threatened
Platanthera peramoena - Petitioned threatened
Poa paludigena - Petitioned threatened
Polemonium reptans var. villosum - Petitioned threatened
Polygonum pensylvanicum var. eglandulosum - Delisted
Potamogeton hillii - Petitioned threatened
Rhus trilobata var. arenaria - Petitioned threatened
Sullivantia sullivantii - Petitioned threatened
Synandra hispidula - Petitioned threatened
Trollius laxus - Petitioned endangered
Veratrum woodii - Petitioned endangered

Additionally, Apios priceana, Oxypolis canbyi and Solidago shortii were all erroneously listed for Ohio in the Federal Register.

In addition to the species listed by the U.S. Fish and Wildlife Service as possibly endangered or threatened on a national level, the Ohio Department of Natural Resources is developing a list of plant species known to be endan-

gered or threatened in the state. This list is attached as Appendix B, and the Ohio endangered plant law is attached as Appendix C.

At least two of the federally listed species presently occur in the coastal zone. Polygonum pensylvanicum var. eglandulosum (pinkweed) occurs as an endemic on the Lake Erie Islands and on the mainland of Ottawa and Erie counties. Panax quinquefolius occurs in Lake County.

Potamogeton hillii and Rhus trilobata var. arenaria previously occurred on or near the Lake Erie shores in Ashtabula County, but neither has been found there in recent years. A population of Cypripedium candidum currently exists in Ottawa County near the coastal zone and populations of Platanthera flava exist in Ashtabula and Lucas counties, though not in the coastal zone. C. candidum previously existed in Lucas County; P. flava in Cuyahoga, Erie, Lake, and Lorain counties; Platanthera leucophaea in Erie County; and Plantago cordata in Erie, Lorain, and Lucas counties.

SITE-SPECIFIC SURVEYS

The Coastal Energy Impact Program staff requested that the Division pay particular attention to five specific areas in the coastal zone (see Appendix A, Letter from Ms. Jacqueline F. Bird Dated July 3, 1979).

These five areas were visited by Division staff on one or more occasions throughout the project. The following comments can be made regarding these sites:

1. SANDUSKY BAY AREA

This refers to the proposed Ohio Power Company facility in Riley and Townsend townships of Sandusky County. Upon completion of land acquisition, the site would encompass approximately 3,890 acres. Access was gained to most, but not all, of this area on several occasions. The area directly west of Bay View may have significant spring flora and should be visited earlier in the growing season. No rare plant species or significant plant communities were encountered by project staff. Most of the area is highly developed agricultural land and holds little potential for significant plant habitat. The wetlands remaining in the area also have undergone substantial modification.

2. CONNEAUT

This site is the Pittsburgh and Conneaut Dock Company coal dock facility adjacent to the steel mill in the city of Conneaut. No rare plants were found

in this area on September 12 and it is unlikely that any would be found at an earlier time of year because of the development and stream channelization in the area.

3. ASHTABULA/LAKE SHORE PARK

This area is approximately one mile east of the Ashtabula River mouth in Ashtabula County. This area was surveyed on September 19 with no rare plants or significant plant communities identified. The area has been significantly impacted by development, including a rock reinforced beach and landscaped grounds. It holds little potential for significant natural features.

4. BERLIN HEIGHTS/ERIE SITE

This is the proposed site for the Ohio Edison Company's Erie Nuclear Power Plant Units 1 and 2. The only known Ohio occurrence of Coeloglossum viride (long bracted orchid) is within the southern portion of the 2,600 foot radius exclusion area boundary. This plant will be proposed for state endangered status in early 1980. The location of the species does not appear to be within the planned construction zone so that the level of protection for this species may increase rather than decrease with the proposed development. In any event, this is a very significant plant occurrence which warrants protection. Consideration also should be given to the impact of the planned facility on the Old Woman Creek National Estuarine Sanctuary.

5. KELLEYS ISLAND

No specific site has been selected for any type of energy facility, but

some consideration is being given to the siting of a wind-powered electric generating facility on the island. There are numerous rare plant occurrences on the north shore of the island, as well as in and near the limestone quarries in the interior of the island. Exact locations and species lists can be compiled for use by concerned entities through heritage program data services.

MANAGEMENT CONSIDERATIONS

All of the proposed endangered, threatened and potentially threatened plant species occurring in the coastal zone are significant elements of Ohio's natural heritage and should be protected whenever possible. If priorities must be set, the greatest protection efforts should be extended to those species whose population levels are critically low or in greatest danger of destruction.

It is impossible in this stage of the art to list sophisticated management techniques appropriate for each endangered or threatened species found in the coastal zone. Such will require detailed observations and experimental studies of each species' needs and limitations for soil types, water quality and quantities, microclimate conditions and extremes, effects of associated species, pollinators, critical population sizes for outcrossing, and other important factors. Nevertheless, much, if not most, protection may be afforded by simply using common sense.

One generality which usually applies is that a species will be protected best by maintaining those habitat conditions in which it currently thrives, or at least survives. This, of course, assumes that the species is also protected from destructive humans. The habitat conditions in which a species thrives, however, are not always apparent. Hence, we have no good alternative but to attempt to maintain those conditions in which we think a population is thriving, until we know otherwise.

PROTECTION STRATEGY

Although research efforts concentrated on rare plant species, significant plant communities and natural areas also were identified and evaluated. No "new" areas of statewide significance were discovered as a result of this study, but information was collected which has aided the Division of Natural Areas and Preserves in the evaluation of coastal zone plant communities and natural areas. Many, if not most, of the best areas already have some level of protection provided to them by a variety of entities. Significant areas are currently protected by several divisions of the Ohio Department of Natural Resources, by the U.S. Fish and Wildlife Service, by local government, and by private organizations such as the hunting clubs of the Sandusky Bay area. Yet there are several areas in the coastal zone which require additional or increased protection efforts. The Division will concentrate preservation efforts on the most significant areas in greatest need of additional protection.

The Division of Natural Areas and Preserves will provide some protection to rare species in the coastal zone by implementing Ohio Revised Code Chapter 1518 (endangered plant law) and by making information available through heritage program data services. This process will provide information to developers, consultants, local governments and others at a level of detail which has never before been available. In addition, the DNAP will contact the owners and/or managers of significant areas to inform them of the value of the natural features on their property. Where possible, the DNAP will assist landowners in the development of management plans designed to protect these natural features. The DNAP will work with the owners of the most significant areas in an attempt to provide the greatest level of protection possible to

these areas. The attitude and interests of the landowner are, of course, of paramount importance in the actions taken by the Division.

Seven areas have been identified by the Division for future landowner contacts. Two of these areas are managed by state government, one by local government, three by corporations and one by private landowners. Four of the areas are in Ottawa County, and one each in Ashtabula, Erie, and Lake counties. The DNAP believes it is essential that the landowner be the first to hear of the Division's concern for the natural features on their property. Protection efforts generally are more successful if the landowner is provided an accurate description of the Division's interest from the Division rather than from a third party.

Natural area protection can take several forms, all of which have different costs and benefits for both the landowner and the Division. Usually some protection is provided by merely notifying the landowner of the natural value of property and encouraging its preservation. This, at least, prevents the unintentional destruction of valuable natural lands. The Division can work with landowners to develop management plans which are both compatible with natural feature preservation and limited use by the landowner. Conservation easements can provide some protection while allowing the landowner to maintain certain rights and privileges of ownership. There are also substantial tax advantages to the landowner who agrees to protect the natural value of the property on a long term basis. Dedication as a state nature preserve under the Ohio Natural Areas Law provides the best possible protection for a natural area in Ohio.

The preservation technique selected by the landowner should be determined on a case-by-case basis after exploring all alternatives. Additional information and technical assistance can be obtained from the Division.

SUMMARY AND CONCLUSIONS

The Ohio Department of Natural Resources, Division of Natural Areas and Preserves, by means of a planning grant from the Ohio Department of Energy, Coastal Energy Impact Program, conducted a two season survey of endangered, threatened, and potentially threatened plant species; significant plant communities; and natural areas in the Lake Erie coastal zone in 1979. Data were obtained from existing sources and from field surveys.

One hundred and sixty-one records of rare plant species were identified as a result of the field surveys. Additional information was collected on the relative quality of plant communities and natural areas in the coastal zone. Several areas were identified as requiring greater protection than is currently afforded. Five specific sites of concern to the Coastal Energy Impact Program were surveyed and evaluated.

Information collected via the Coastal Energy Impact Program planning grant has assisted the Division in the development of the proposed endangerment status for plants under Ohio Revised Code Chapter 1518 (Endangered Plant Law). Additional field work, especially in the spring, will be necessary to gain a more accurate understanding of the relative rarity of certain plant species.

Data collected during this summer will be made available to concerned entities through the Natural Heritage Program data services system.

The Ohio Department of Natural Resources, Division of Natural Areas and Preserves, commends the Ohio Department of Energy, Coastal Energy Impact Program, for its concern for endangered plant species, plant communities and natural areas in the coastal zone.

APPENDIX A. Letter from J. Bird



James A. Rhodes
GOVERNOR

Robert S. Ryan
DIRECTOR

30 East Broad Street 34th Floor
Columbus, Ohio 43215
(614) 466-6797

July 3, 1979

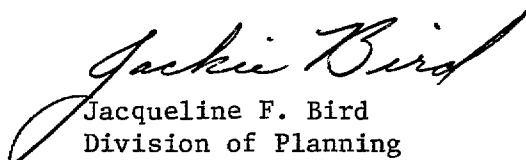
Mr. Robert McCance
Division of Natural Areas
and Preserves
Ohio Department of Natural
Resources
Fountain Square
Columbus, Ohio

Dear Mr. McCance:

This letter is to confirm our recent telephone conversation regarding CEIP Contract No. 79-16. At that time you requested a list of specific areas to be studied. They are: Sandusky Bay area, Conneaut, Ashtabula/Lake Shore Park area, Berlin Heights/Erie site, and Kelleys Island. (The first three areas should be given a higher priority than the last two areas.)

A-95 and Controlling Board approval have been given to this contract, and we expect federal approval very soon. When we receive it, we will contact you immediately so that work may begin on the project.

Sincerely,


Jacqueline F. Bird
Division of Planning

APPENDIX B. List of Rare Plants of Ohio

RARE SPECIES OF NATIVE OHIO WILD PLANTS

The attached list represents a draft tabulation of Ohio endangered, threatened, etc., vascular plant species as determined by the Natural Heritage Program on the indicated date. The list was compiled pursuant to Ohio Revised Code Chapter 1518 which directs the Chief of the Division of Natural Areas and Preserves to adopt criteria and lists of plants endangered or threatened in the state. The draft list, with necessary alterations, will become legal following completion of the public hearing process.

The species are listed by family according to classic phylogenetic order. Nomenclature is generally that of M.L. Fernald, 1950, Gray's Manual of Botany, eighth edition. Where more recent names are employed, applicable synonyms in Fernald are indicated in parentheses. A column marked "Code No." indicates data processing numbers utilized by the Natural Heritage Program. The columns marked "US" and "OH" indicate status levels of the species as assigned by the U.S. Fish and Wildlife Service and by the Ohio D.N.R., Division of Natural Areas and Preserves. Status codes are as follows:

- | | |
|--------------------------|----------------------------|
| X - Extirpated | PT - Proposed Threatened |
| E - Endangered | P - Potentially Threatened |
| PE - Proposed Endangered | H - Hybrid |
| T - Threatened | |

Although endangered hybrids are offered legal protection by neither the federal nor state governments, they are included on the list for scientific and educational reasons.

Questions should be directed to the Natural Heritage Program Administrator, Division of Natural Areas and Preserves, Ohio Department of Natural Resources, Fountain Square, Columbus, Ohio 43224.

DIVISION OF NATURAL AREAS AND PRESERVES
NATURAL HERITAGE PROGRAM
Special Plants
Pteridophytes

	<u>Code No.</u>	<u>US</u>	<u>OH</u>
LYCOPODIACEAE. Clubmoss Family			
Lycopodium inundatum, Bog Clubmoss.....	EA F46		P
SELAGINELLACEAE. Spikemoss Family			
Selaginella rupestris, Rock Spikemoss.....	EY F47		T
ISOETACEAE. Quillwort Family			
Isoetes engelmannii (I. engelmanni), Appalachian Quillwort.....	EB 359		E
Isoetes muricata, Spiny-spored Quillwort.....	EB F48		X
EQUISETACEAE. Horsetail Family			
Equisetum sylvaticum, Woodland Horsetail.....	EZ A07		T
Equisetum variegatum (E. variegatum var. variegatum), Variegated Scouring-rush.....	EZ F50		P
Equisetum X nelsonii (E. variegatum var. nelsoni), Nelson's Scouring-rush.....	EZ F51		H
Equisetum X trachyodon (E. variegatum var. jesupi), Jesup's Scouring-rush.....	EZ F52		H
OPHIOGLOSSACEAE. Adder's-tongue Family			
Botrychium bitermum (B. dissectum var. tenuifolium; see Gleason and Cronquist), Sparse-lobe Grape-fern..	EC F53		E
Botrychium lanceolatum, Triangle Grape-fern.....	EC 082		E
Botrychium multifidum, Leathery Grape-fern.....	EC F54		T
Botrychium simplex (including varieties & formae), Least Grape-fern.....	EC F55		E
Botrychium ternatum (not in Fernald 1950; see Wherry 1961), American Ternate Grape-fern.....	EC F56		E
Ophioglossum engelmannii (O. engelmanni), Limestone Adder's-tongue.....	EC F57		E
SCHIZAEACEAE. Curly-grass Family			
Lygodium palmatum, Climbing Fern.....	ED 429		P
ADIANTACEAE (POLYPODIACEAE). Maidenhair Family			
Pellaea glabella, Smooth Cliff-brake.....	EF B14		P
Vittaria lineata (not in Fernald 1950; see Wagner & Sharp, 1963), Appalachian Gametophyte.....	EF B08		T
HYMENOPHYLLACEAE. Filmy Fern Family			
Trichomanes boschianum, Appalachian Filmy Fern.....	EE 726		E

	Code No.	US	OH
POLYPODIACEAE. Polypody Family			
Polypodium polypodioides, Little Gray Polypody.....	EF F69		E
ASPLENIACEAE (POLYPODIACEAE). Spleenwort Family			
Asplenium bradleyi, Bradley's Spleenwort.....	EF 057		E
Asplenium montanum, Mountain Spleenwort.....	EF F58		P
Asplenium resiliens, Black-stem Spleenwort.....	EF 063		X
Asplenium ruta-muraria var. cryptolepis (A. cryptolepis var. cryptolepis & var. ohionis; including A. r. var. subtenuifolium), Wall-rue.....	EF 065		T
Asplenium X clermontae (not in Fernald 1950; see Wherry 1961), Miss Clermont's Spleenwort.....	EF F59		H
Asplenium X ebenoides (X Asplenosorus ebenoides), Scott's Spleenwort.....	EF F60		H
Asplenium X inexpectatum (X Asplenosorus inexpectatus), Unexpected Spleenwort.....	EF F61		H
Asplenium X kentuckiense (not in Fernald 1950; see Wherry 1961 under A. X Kentuckyense), Kentucky Spleenwort.....	EF F62		H
Asplenium X trudellii (X A. trudellii), Trudell's Spleenwort.....	EF 066		H
Cystopteris X tennesseensis (not in Fernald 1950; see Wherry 1961), Tennessee Bladder Fern.....	EF 209		H
Dryopteris clintoniana (D. cristata var. clintoniana), Clinton's Wood Fern.....	EF F64		E
Dryopteris X boottii (X D. boottii), Boott's Wood Fern...	EF F65		H
Dryopteris X pittsfordensis (not in Fernald 1950; see Wherry 1961), Pittsford Wood Fern.....	EF B10		H
Dryopteris X slossonae (not in Fernald 1950; see Wherry 1961), Miss Slosson's Wood Fern.....	EF F66		H
Dryopteris clintoniana (D. cristata var. clintoniana) X Dryopteris goldiana,.....	EF F67		H
Dryopteris goldiana X Dryopteris intermedia.....	EF F68		H
Gymnocarpium dryopteris (Dryopteris disjuncta), Oak Fern.....	EF 296		T
Matteuccia pensylvanica (Pteretis pensylvanica), Ostrich Fern.....	EF A09		P
Phegopteris connectilis (Thelypteris phegopteris; Dryopteris phegopteris), Long Beech-fern.....	EF 720		P
Woodsia ilvensis, Rusty Woodsia.....	EF 759		X
BLECHNACEAE (POLYPODIACEAE). Blechnum Family			
Anchistea virginica (Woodwardia virginica), Virginia Chain-fern.....	EF 761		P
Lorinseria areolata (Woodwardia areolata), Netted Chain-fern.....	EF F70		E

Gymnosperms

PINACEAE. Pine Family			
Larix laricina, Tamarack.....	FA 377		P
Pinus echinata, Yellow Pine.....	FA 775		P
CUPRESSACEAE (PINACEAE). Cypress Family			
Juniperus communis (including varieties) Ground Juniper.	FC 371		T
Thuja occidentalis, Arbor Vitae.....	FC 776		P

OHIO NATURAL HERITAGE PROGRAM
Special Plants
Angiosperms - Monocotyledons

	<u>Code No.</u>	<u>US</u>	<u>OH</u>
SPARGANIACEAE. Bur-reed Family			
Sparganium angrocladum, Keeled Bur-reed.....	GB A70		T
Sparganium chlorocarpum, Small Bur-reed.....	GB 686		E
POTAMOGETONACEAE (ZOSTERACEAE). Pondweed Family			
Potamogeton amplifolius, Large-leaved Pondweed.....	GC 543		P
Potamogeton epihydrus, Nuttall's Pondweed.....	GC F25		P
Potamogeton filiformis, Filiform Pondweed.....	GC H51		E
Potamogeton friesii, Fries' Pondweed.....	GC H52		X
Potamogeton gramineus, Grass-like Pondweed.....	GC H53		E
Potamogeton hillii, Hill's Pondweed.....	GC H54		X
Potamogeton natans, Floating Pondweed.....	GC 547		T
Potamogeton perfoliatus, Red-head Pondweed.....	GC H55		X
Potamogeton praelongus, White-stem Pondweed.....	GC H56		E
Potamogeton pulcher, Spotted Pondweed.....	GC B16		E
Potamogeton richardsonii, Richardson's Pondweed.....	GC H58		T
Potamogeton robbinsii, Robbins' Pondweed.....	GC H59		E
Potamogeton spirillus, Spiral Pondweed.....	GC B17		T
Potamogeton strictifolius, Straight-leaved Pondweed.....	GC H60		X
Potamogeton tennesseensis, Tennessee Pondweed.....	GC 549		E
Potamogeton vaseyi, Vasey's Pondweed.....	GC H61		X
Potamogeton zosteriformis, Flat-stem Pondweed.....	GC B18		T
NAJADACEAE. Naiad Family			
Najas flexilis, Slender Naiad.....	GZ E95		P
Najas gracillima, Thread-like Naiad.....	GZ E96		X
JUNCAGINACEAE. Arrow-grass Family			
Scheuchzeria palustris, Scheuchzeria.....	GE 634		E
Triglochin maritimum (T. maritima), Seaside Arrow-grass..	GE H62		E
Triglochin palustre (T. palustris), Marsh Arrow-grass....	GE H63		T
ALISMATACEAE. Water-Plantain Family			
Echinodorus rostratus, Bur-head.....	GF H64		T
Lophotocarpus calycinus, Southern Wapato.....	GF A72		P
Sagittaria australis, Long-beaked Arrowhead.....	GF H65		T
Sagittaria cuneata, Wapato.....	GF H66		T
Sagittaria graminea, Grass-leaf Arrowhead.....	GF 618		T
Sagittaria latifolia var. pubescens, Hairy Arrowhead.....	GF H67		E
HYDROCHARITACEAE. Frog's-bit Family			
Vallisneria americana, Eel-grass.....	GG H68		P

Code No.

US

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GRAMINEAE (POACEAE). Grass Family

Agropyron trachycaulum, Bearded Wheat Grass.....	GH 015
Agrostis elliottiana, Elliott's Bent-grass.....	GH 017
Ammophila breviligulata, American Beach Grass.....	GH H69
Aristida purpurascens, Purple Triple-awned Grass.....	GH H70
Calamagrostis inexpansa, Northern Reed-grass.....	GH H71
Calamagrostis insperata (not in Fernald; see Braun), Bartley's Reed Bent Grass.....	GH H72
Cinna latifolia, Northern Wood-reed.....	GH H74
Danthonia compressa, Flattened Wild Oat Grass.....	GH H75
Deschampsia caespitosa, Tufted Hairgrass.....	GH 214
Deschampsia flexuosa, Crinkled Hairgrass.....	GH H76
Digitaria filiformis, Slender Finger-grass.....	GH B26
Erianthus alopecuroides, Silver Plume Grass.....	GH H77
Glyceria acutiflora, Sharp-glumed Manna-grass.....	GH B28
Glyceria borealis, Northern Manna-grass.....	GH H78
Glyceria grandis, Tall Manna-grass.....	GH B30
Glyceria melicaria, Long Manna-grass.....	GH H79
Glyceria pallida, Pale Manna-grass.....	GH 292
Gymnopogon ambiguus, Beardgrass.....	GH H80
Koeleria macrantha (K. cristata), Junegrass.....	GH H81
Leptoloma cognatum, Fall Witch-grass.....	GH H82
Melica nitens, Three-flowered Melic.....	GH 446
Muhlenbergia capillaris, Hairgrass.....	GH H83
Muhlenbergia curtisetosa, Short-awned Nimble-will.....	GH H84
Muhlenbergia cuspidata, Plains Muhlenbergia.....	GH H85
Panicum bicknellii, Bicknell's Panic-grass.....	GH H86
Panicum boreale, Northern Panic-grass.....	GH H87
Panicum calliphyllum, Tall Green Panic-grass.....	GH H88
Panicum columbianum, American Panic-grass.....	GH B39
Panicum depauperatum, Starved Panic-grass.....	GH H89
Panicum laxiflorum, Pale Green Panic-grass.....	GH H90
Panicum leibergii, Leiberg's Panic-grass.....	GH H91
Panicum longifolium, Long-leaved Panic-grass.....	GH H92
Panicum oligosanthos, Prairie Panic-grass.....	GH H93
Panicum philadelphicum, Philadelphia Panic-grass.....	GH 488
Panicum verrucosum, Warty Panic-grass.....	GH H94
Panicum villosissimum, Villous Panic-grass.....	GH H95
Panicum yadkinense, Spotted Panic-grass.....	GH B41
Paspalum setaceum, Slender Paspalum.....	GH H96
Poa languida, Weak Spear-grass.....	GH 529
Poa paludigena, Marsh Spear-grass.....	GH H97
Poa wolfii, Wolf's Bluegrass.....	GH H98
Schizachne purpurascens, False Melic.....	GH B46
Sphenopholis obtusata, Prairie Wedgegrass.....	GH B48
Sporobolus cryptandrus, Sand Dropseed.....	GH H99
Sporobolus heterolepis, Prairie Dropseed.....	GH 693
Stipa avenacea, Blackseed Needle Grass.....	GH B49
Stipa spartea, Porcupine Grass.....	GH G67
Triplasis purpurea, Purple Sand-grass.....	GH J00

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	<u>Code No.</u>	<u>US</u>	<u>OH</u>
GRAMINEAE (POACEAE). Grass Family (Cont'd.)			
Trisetum pensylvanicum, Swamp-oats.....	GH J01		T
Uniola latifolia, Wild Oats.....	GH J02		P
Zizania aquatica, Wild Rice.....	GH B03		T
CYPERACEAE. Sedge Family			
Carex aggregata, Crowded Sedge.....	GJ B50		P
Carex alata, Broad-winged Sedge.....	GJ J03		E
Carex albolutescens, Pale Straw Sedge.....	GJ J04		E
Carex amphibola var. rigida, Stiff Wood Sedge.....	GJ J05		E
Carex annectans var. xanthocarpa, Yellow-fruited Sedge..	GJ R57		T
Carex aquatilis, Leafy Tussock Sedge.....	GJ J06		E
Carex arctata, Drooping Wood Sedge.....	GJ J07		E
Carex argyrantha, Silvery Sedge.....	GJ J08		E
Carex atherodes, Wheat Sedge.....	GJ A14		T
Carex aurea, Golden-fruited Sedge.....	GJ J09		T
Carex baileyi, Bailey's Sedge.....	GJ J10		X
Carex bebbii, Bebb's Sedge.....	GJ J10		X
Carex brevior, Tufted Fescue Sedge.....	GJ J11		P
Carex brunnescens, Brownish Sedge.....	GJ J12		X
Carex buxbaumii, Brown Bog Sedge.....	GJ J13		T
Carex cephalantha, Little Prickly Sedge.....	GJ J13		E
Carex cephaloidea, Thin-leaf Sedge.....	GJ J14		E
Carex conoidea, Field Sedge.....	GJ J18		T
Carex crawei, Crawe's Sedge.....	GJ E33		T
Carex crus-corvi, Raven-foot Sedge.....	GJ J15		X
Carex cryptolepis (C. flava var. fertilis), Little Yellow Sedge.....	GJ J16		P
Carex debilis var. debilis, Weak Sedge.....	GJ J17		E
Carex debilis var. rudgei, Rudge's Sedge.....	GJ J17		P
Carex decomposita, Cypress-knee Sedge.....	GJ J20		X
Carex deweyana, Dewey's Sedge.....	GJ J19		X
Carex diandra, Lesser Panicked Sedge.....	GJ J20		E
Carex eburnea, Bristle-leaf Sedge.....	GJ J22		P
Carex emmonsii, Emmons' Sedge.....	GJ J21		E
Carex festucacea, Fescue Sedge.....	GJ J22		P
Carex flava (C. flava var. flava, but not C. flava var. fertilis. See C. cryptolepis.), Yellow Sedge.....	GJ J23		E
Carex foenea, Hay Sedge.....	GJ J24		X
Carex folliculata, Long Sedge.....	GJ J25		T
Carex formosa, Handsome Sedge.....	GJ J26		E
Carex glaucoidea (C. flaccosperma var. glaucoidea), Blue- green Sedge.....	GJ J27		T
Carex gravida, Heavy Sedge.....	GJ E34		T
Carex haydenii, Hayden's Sedge.....	GJ J28		E
Carex howei, Howe's Sedge.....	GJ B57		E
Carex incompta, Prickly Bog Sedge.....	GJ J29		P
Carex interior, Inland Sedge.....	GJ J30		T
Carex lasiocarpa, Slender Sedge.....	GJ A15		E
Carex limosa, Mud Sedge.....	GJ J31		X
Carex louisianica, Louisiana Sedge.....	GJ J32		E
Carex lupuliformis, False Hop Sedge.....	GJ J26		P

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CYPERACEAE. Sedge Family (Cont'd.)

Carex meadii, Mead's Sedge.....	GJ B61
Carex merritt-fernaldii, Fernald's Sedge.....	GJ J33
Carex mesochorea, Midland Sedge.....	GJ B64
Carex muhlenbergii, Muhlenberg's Sedge.....	GJ J34
Carex nigromarginata, Black-margined Sedge.....	GJ B66
Carex oligosperma, Few-seeded Sedge.....	GJ J35
Carex ormostachya, Stiff Broad-leaved Sedge.....	GJ L56
Carex pallescens, Pale Sedge.....	GJ J36
Carex pedunculata, Long-stalked Sedge.....	GJ B67
Carex prairea, Prairie Sedge.....	GJ A16
Carex projecta, Necklace Sedge.....	GJ J30
Carex pseudo-cyperus, Smaller Bearded Sedge.....	GJ J37
Carex radiata, Radiate Sedge.....	GJ J38
Carex retroflexa, Reflexed Sedge.....	GJ J39
Carex retrorsa, Reflexed Bladder Sedge.....	GJ J40
Carex richardsonii, Richardson's Sedge.....	GJ J41
Carex rostrata, Beaked Sedge.....	GJ E39
Carex sartwellii, Sartwell's Sedge.....	GJ J42
Carex scabrata, Rough Sedge.....	GJ J43
Carex seorsa, Weak Bog Sedge.....	GJ J44
Carex sprengelii, Sprengel's Sedge.....	GJ J45
Carex sterilis, Fen Sedge.....	GJ J46
Carex straminea, Straw Sedge.....	GJ J47
Carex striatula, Lined Sedge.....	GJ G83
Carex suberecta, Prairie Straw Sedge.....	GJ B70
Carex X sullivantii, Sullivant's Sedge.....	GJ R58
Carex tenera, Slender Straw Sedge.....	GJ J49
Carex tetanica, Slender Millet Sedge.....	GJ J35
Carex trichocarpa, Hairy-fruited Sedge.....	GJ B72
Carex trisperma, Three-seeded Sedge.....	GJ J37
Carex viridula, Little Green Sedge.....	GJ J50
Carex willdenowii, Willdenow's Sedge.....	GJ J51
Cladium mariscoides, Twig-rush.....	GJ E41
Cyperus acuminatus, Pale Umbrella-sedge.....	GJ J52
Cyperus diandrus, Low Umbrella-sedge.....	GJ J53
Cyperus dipsaciformis, Teasel-sedge.....	GJ J54
Cyperus engelmannii (C. engelmanni), Engelmann's Umbrella-sedge.....	GJ E42
Cyperus houghtonii, Houghton's Umbrella-sedge.....	GJ J55
Cyperus lancastriensis, Many-flowered Umbrella-sedge.....	GJ J56
Cyperus refractus, Reflexed Umbrella-sedge.....	GJ B75
Cyperus schweinitzii, Schweinitz's Umbrella-sedge.....	GJ J57
Eleocharis compressa, Flat-stem Spikerush.....	GJ B77
Eleocharis elliptica, Yellow-seeded Spikerush.....	GJ J58
Eleocharis intermedia, Matted Spikerush.....	GJ A17
Eleocharis olivacea, Olivaceous Spikerush.....	GJ J59
Eleocharis pauciflora, Few-flowered Spikerush.....	GJ J60
Eleocharis quadrangulata, Four-angled Spikerush.....	GJ J61
Eleocharis rostellata, Beaked Spikerush.....	GJ 247
Eleocharis wolfii, Wolf's Spikerush.....	GJ J62
Eriophorum gracile, Slender Cottongrass.....	GJ J63

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	<u>Code No.</u>	<u>US</u>	<u>OH</u>
CYPERACEAE. Sedge Family (Cont'd.)			
Eriophorum virginicum, Tawny Cottongrass.....	GJ E48		T
Eriophorum viridi-carinatum, Green Cottongrass.....	GJ J64		T
Hemicarpha micrantha, Dwarf Bulrush.....	GJ 317		E
Rhynchospora alba, White Beak-rush.....	GJ 600		T
Rhynchospora globularis, Grass-like Beak-rush.....	GJ B78		E
Scirpus expansus, Woodland Bulrush.....	GJ E56		E
Scirpus purshianus, Pursh's Bulrush.....	GJ B79		T
Scirpus smithii, Smith's Bulrush.....	GJ J65		E
Scirpus subterminalis, Swaying Rush.....	GJ 646		E
Scirpus torreyi, Torrey's Bulrush.....	GJ J66		X
Scleria pauciflora, Few-flowered Nut-rush.....	GJ J67		T
Scleria triglomerata, Tall Nut-rush.....	GJ B82		T
Scleria verticillata, Low Nut-rush.....	GJ E58		T
ARACEAE. Arum Family			
Arisaema stewardsonii, Swamp Jack-in-the-pulpit.....	GL J68		P
Arisaema triphyllum, Small Jack-in-the-pulpit.....	GL J69		P
Calla palustris, Wild Calla.....	GL J70		T
LEMNACEAE. Duckweed Family			
Lemna valdiviana, Pale Duckweed.....	GM B83		X
Wolffia papulifera, Pointed Water-meal.....	GM 758		T
Wolffiella floridana, Wolffiella.....	GM J71		X
XYRIDACEAE. Yellow-eyed-grass Family			
Xyris difformis (X. caroliniana), Carolina Yellow-eyed-grass.....	GN J72		X
Xyris torta, Twisted Yellow-eyed-grass.....	GN 766		E
ERIOCAULACEAE. Pipewort Family			
Eriocaulon septangulare, White-buttons.....	GP 259		X
PONTEDERIACEAE. Pickerelweed Family			
Heteranthera reniformis, Mud-plantain.....	GR A20		X
JUNCACEAE. Rush Family			
Juncus alpinus, Alpine Rush.....	GS J74		T
Juncus balticus, Baltic Rush.....	GS 367		T
Juncus greenei, Greene's Rush.....	GS J75		T
Juncus interior, Inland Rush.....	GS J76		E
Juncus platyphyllus, Flat-leaved Rush.....	GS B88		T
Juncus scirpoides, False Bulrush.....	GS B89		T
Juncus secundus, One-sided Rush.....	GS J77		T
Luzula bulbosa, Southern Woodrush.....	GS B91		E

Code No.

US

OH

LILIACEAE. Lily Family

Alettris farinosa, Unicorn-root.....	GT J79
Clintonia borealis, Bluebead-lily.....	GT E85
Clintonia umbellulata, Speckled Wood-lily.....	GT J80
Disporum maculatum, Nodding Mandarin.....	GT 223
Erythronium rostratum (not in Fernald 1950; see Braun 1967), Goldenstar.....	GT E86
Lilium philadelphicum, Wood-lily.....	GT 398
Lilium superbum, Turk's-cap Lily.....	GT 769
Melanthium virginicum, Bunchflower.....	GT E90
Nothoscordum bivalve, False Garlic.....	GT J81
Smilacina trifolia, Three-leaved Solomon's-seal.....	GT J82
Smilax illinoensis, Illinoian Smilax.....	GT J83
Smilax lasioneura, Pale Carrion-flower.....	GT J84
Smilax pulverulenta, Downy Carrion-flower.....	GT J85
Stenanthium gramineum, Feather-bells.....	GT J86
Streptopus roseus, Rose Twisted-stalk.....	GT 704
Tofieldia glutinosa, False Asphodel.....	GT A24
Trillium cernuum, Nodding Trillium.....	GT 732
Trillium nivale, Snow Trillium.....	GT A74
Trillium recurvatum, Prairie Wake-robin.....	GT J87
Trillium undulatum, Painted Trillium.....	GT J88
Veratrum viride, White Hellebore.....	GT J89
Veratrum woodii, Wood's Hellebore.....	GT E93
Zygadenus glaucus (Zigadenus glaucus), Wand-lily.....	GT 767

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AMARYLLIDACEAE. Amaryllis Family

Agave virginica, American Aloe.....	GV A25
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IRIDACEAE. Iris Family

Iris brevicaulis, Leafy Blue Flag.....	GX J91
Iris verna, Dwarf Iris.....	GX 357
Sisyrinchium atlanticum, Atlantic Blue-eyed-grass.....	GX J92
Sisyrinchium montanum, Northern Blue-eyed-grass.....	GX J93
Sisyrinchium mucronatum, Narrow-leaved Blue-eyed-grass...	GX J94

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	Code No.	US	OH
ORCHIDACEAE. Orchid Family			
Arethusa bulbosa, Dragon's-mouth.....	GY 051		E
Calopogon tuberosus (C. pulchellus), Grass-pink.....	GY K69		P
Coeloglossum viride (Habenaria viridis), Long-bracted Orchid.....	GY A28		E
Corallorhiza maculata, Spotted Coral-root.....	GY 177		P
Corallorhiza trifida, Early Coral-root.....	GY A27		E
Corallorhiza wisteriana, Spring Coral-root.....	GY 179		E
Cypripedium acaule, Stemless Lady's-slipper.....	GY 204		P
Cypripedium calceolus var. parviflorum, Small Yellow Lady's-slipper.....	GY 205		E
Cypripedium calceolus var. pubescens, Large Yellow Lady's-slipper.....	GY 205		P
Cypripedium candidum, White Lady's-slipper.....	GY K52		E
Cypripedium reginae, Showy Lady's-slipper.....	GY 206		T
Goodyera tessellata, Checkered Rattlesnake-plantain.....	GY K53		X
Hexalectris spicata, Crested Coral-root.....	GY 328		E
Isotria verticillata, Whorled Pogonia.....	GY 364		P
Liparis loeselii, Fen Orchid.....	GY 404		P
Listera cordata, Heartleaf Twayblade.....	GY 406		X
Malaxis unifolia, Green Adder's-mouth.....	GY 439		P
Platanthera blephariglottis (Habenaria blephariglottis), White Fringed Orchid.....	GY 298		X
Platanthera ciliaris (Habenaria ciliaris), Yellow Fringed Orchid.....	GY 299		E
Platanthera clavellata (Habenaria clavellata), Green Woodland Orchid.....	GY G95		T
Platanthera flava (Habenaria flava), Tubercled Rein- orchid.....	GY 300		P
Platanthera grandiflora (Habenaria psycodes var. grandiflora; H. fimbriata), Large Purple-fringed Orchid.....	GY AC9		X
Platanthera hookeri (Habenaria hookeri), Hooker's Orchid.....	GY K55		X
Platanthera hyperborea (Habenaria hyperborea), Tall Northern Green Orchid.....	GY K56		X
Platanthera leucophaea (Habenaria leucophaea), Prairie Fringed Orchid.....	GY K57		X
Platanthera orbiculata (Habenaria orbiculata), Large Round-leaved Orchid.....	GY 302		T
Platanthera peramoena (Habenaria peramoena), Purple Fringeless Orchid.....	GY 303		P
Platanthera psycodes (Habenaria psycodes var. psycodes), Small Purple Fringed Orchid.....	GY F05		T
Pogonia ophioglossoides, Rose Pogonia.....	GY K61		T
Spiranthes lacera var. gracilis (Spiranthes gracilis), Southern Slender Ladies'-tresses.....	GY K63		P
Spiranthes lucida, Shining Ladies'-tresses.....	GY A76		T
Spiranthes magnicamporum (not in Fernald 1950; see Luer 1975), Great Plains Ladies'-tresses.....	GY V12		E
Spiranthes ovalis, Lesser Ladies'-tresses.....	GY 691		T
Spiranthes romanzoffiana, Hooded Ladies'-tresses.....	GY K65		E
Spiranthes tuberosa, Little Ladies'-tresses.....	GY A75		P
Triphora trianthophora, Three-birds-orchid.....	GY 736		T

OHIO NATURAL HERITAGE PROGRAM
Special Plants
Angiosperms - Dicotyledons

	<u>Code No.</u>	<u>US</u>	<u>OH</u>
SALICACEAE. Willow Family			
Populus balsamifera, Balsam Poplar.....	KM 777		E
Populus heterophylla, Swamp Cottonwood.....	KM 778		X
Salix bebbiana, Long-beaked Willow.....	KM 779		T
Salix candida, Hoary Willow.....	KM 780		T
Salix caroliniana, Carolina Willow.....	KM 781		E
Salix glaucophylloides var. glaucophylloides (S. glaucophylloides var. glaucophylla), Blue-leaved Willow...	KM 782		X
Salix glaucophylloides var. albovestita, Dune Willow.....	KM 782		X
Salix pedicellaris, Bog Willow.....	KM 783		E
Salix petiolaris (S. gracilis var. textoris), Slender Willow.....	KM 784		T
Salix serissima, Autumn Willow.....	KM 785		T
Salix X subsericea.....	KM 786		H
Salix syrticola, Sand-dune Willow.....	KM 787		X
MYRICACEAE. Bayberry Family			
Comptonia peregrina, Sweet-fern.....	JH 788		T
Myrica pensylvanica, Bayberry.....	JH 789		E
BETULACEAE (CORYLACEAE). Birch Family			
Betula lenta, Sweet Birch.....	JK C50		P
Betula populifolia, Gray Birch.....	JK K04		P
Betula pumila, Swamp Birch.....	JK 791		T
Corylus cornuta, Beaked Hazel.....	JL 792		E
FAGACEAE. Beech Family			
Castanea dentata, American Chestnut.....	JJ 142		P
Quercus ellipsoidalis, Jack Oak.....	JJ 794		X
Quercus falcata, Spanish Oak.....	JJ 795		T
Quercus marilandica, Blackjack Oak.....	JJ 796		T
Quercus shumardii, Shumard's Red Oak.....	JJ B93		P
ULMACEAE. Elm Family			
Celtis tenuifolia, Dwarf Hackberry.....	JD C59		P
Ulmus americana, American Elm.....	JD 797		P
Ulmus thomasii, Rock Elm.....	JD 798		E
URTICACEAE. Nettle Family			
Pilea fontana, Coolwort.....	JF 799		P
Urtica chamaedryoides, Spring Nettle.....	JF 800		E
VISCACEAE (LORANTHACEAE). Mistletoe Family			
Phoradendron serotinum (P. flavescens), American Mistletoe.....	MA X61		P
POLYGONACEAE. Buckwheat Family			
Polygonum careyi, Carey's Smartweed.....	JT 801		X

	Code No.	US	OH
POLYGONACEAE. Buckwheat Family (Cont'd.)			
Polygonum cilinode, Mountain Bindweed.....	JT 802		E
Polygonum pensylvanicum var. eglandulosum, Lake Erie pinkweed.....	JT 803	PE	T
Polygonum ramosissimum, Bushy Knotweed.....	JT 804		E
CHENOPODIACEAE. Goosefoot Family			
Chenopodium capitatum, Strawberry-blite.....	JQ 805		X
Chenopodium leptophyllum, Slender Goosefoot.....	JQ 806		E
AMARANTHACEAE. Amaranth Family			
Froelichia floridana, Cottonweed.....	JR 807		E
PORTULACACEAE. Purslane Family			
Claytonia caroliniana, Carolina Spring-beauty.....	JP 808		T
CARYOPHYLLACEAE. Pink Family			
Arenaria patula, Spreading Sandwort.....	JN 809		E
Arenaria stricta (including varieties), Rock Sandwort....	JN V96		P
Sagina decumbens, Southern Pearlwort.....	JN 810		X
Silene caroliniana var. pennsylvanica, Carolina Catchfly..	JN 811		T
Silene caroliniana var. wherryi, Wherry's Catchfly.....	JN 811		T
Silene nivea, Snowy Champion.....	JN 812		X
Silene regia, Royal Catchfly.....	JN 669		E
Silene rotundifolia, Round-leaved Catchfly.....	JN 670		T
CERATOPHYLLACEAE. Hornwort Family			
Ceratophyllum echinatum, Prickly Hornwort.....	HG 813		T
NYMPHAEACEAE. Water-lily Family			
Nuphar variegatum, Bullhead Lily.....	HF 814		E
RANUNCULACEAE. Buttercup Family			
Aconitum noveboracense, Northern Monkshood.....	HH 815	T	E
Actaea rubra, Red Baneberry.....	HH 816		E
Anemone cylindrica, Prairie Thimbleweed.....	HH 817		T
Clematis occidentalis, Purple Virgin's-bower.....	HH 169		X
(C. verticillaris. See Pringle 1971)			
Coptis groenlandica, Goldthread.....	HH 818		P
Delphinium exaltatum, Tall Larkspur.....	HH 212		T
Ranunculus fascicularis, Early Buttercup.....	HH 819		T
Ranunculus pusillus, Low Spearwort.....	HH 820		E
Trollius laxus, Spreading Globe-flower.....	HH 821	PE	E
MAGNOLIACEAE. Magnolia Family			
Magnolia macrophylla, Bigleaf Magnolia.....	HA 822		E
Magnolia tripetala, Umbrella Magnolia.....	HA 436		T
CALYCANTHACEAE. Calycanthus Family			
Calycanthus fertilis, Sweet-shrub.....	HC 823		E
FUMARIACEAE (PAPAVERACEAE). Fumitory Family			
Adlumia fungosa, Mountain-fringe.....	JA 006		E
Corydalis sempervirens, Rock-harlequin.....	JA 186		T

	Code No.	US	OH
CRUCIFERAE (BRASSICACEAE). Mustard Family (Cont'd.)			
Arabis divaricarpa, Limestone Rock-cress.....	KP 824		E
Arabis drummondii, Drummond's Rock-cress.....	KP 825		E
Arabis hirsuta var. pycnocarpa, Western Hairy Rock-cress.....	KP 826		T
Arabis hirsuta var. adpressipilis, Southern Hairy Rock-cress.....	KP 826		P
Arabis lyrata, Lyre-leaf Rock-cress.....	KP 044		P
Arabis patens, Spreading Rock-cress.....	KP 045		E
Armoracia aquatica, Lake-cress.....	KP 827		X
Cakile edentula var. lacustris, Inland Sea-rocket.....	KP C61		P
Cardamine rotundifolia, Mountain-watercress.....	KP 106		P
Dentaria multifida, Narrow-leaved Toothwort.....	KP 829		E
Descurainia pinnata, Tansy-mustard.....	KP 830		P
Draba brachycarpa, Little Whitlow-grass.....	KP 831		E
Draba cuneifolia, Wedge-leaf Whitlow-grass.....	KP 832		E
Draba reptans, Carolina Whitlow-grass.....	KP 228		E
Erysimum arkansanum, Western Wall-flower.....	KP 833		X
Leavenworthia uniflora, Michaux's Leavenworthia.....	KP 834		T
Rorippa sessiliflora, Sessile Yellow-cress.....	KP 835		T
SARRACENIACEAE. Pitcher-plant Family			
Sarracenia purpurea, Pitcher-plant.....	KE 627		T
DROSERACEAE. Sundew Family			
Drosera intermedia, Spathulate-leaved Sundew.....	KF 836		E
Drosera rotundifolia, Round-leaved Sundew.....	KF 231		P
SAXIFRAGACEAE. Saxifrage Family			
Heuchera parviflora, Small-flowered Alumroot.....	LB 326		E
Heuchera villosa, Hairy Alumroot.....	LB 838		E
Parnassia glauca, Grass-of-Parnassus.....	LB C62		P
Ribes glandulosum, Skunk Currant.....	LB 840		X
Ribes hirtellum, Smooth Gooseberry.....	LB 841		P
Ribes lacustre, Bristly Black Currant.....	LB 842		X
Ribes missouriense, Missouri Gooseberry.....	LB 843		X
Ribes rotundifolium, Appalachian Gooseberry.....	LB 844		E
Sullivantia sullivantii, Sullivantia.....	LB 845		P
ROSACEAE. Rose Family			
Agrimonia striata, Hairy Agrimony.....	LC 846		T
Amelanchier laevis, Allegheny Serviceberry.....	LC C63		T
Amelanchier sanguinea, Rock Serviceberry.....	LC 847		T
Crataegus brainerdii, Brainerd's Hawthorn.....	LC 848		X
Crataegus phaenopyrum, Washington-thorn.....	LC 849		X
Crataegus uniflora, Dwarf Hawthorn.....	LC 850		X
Dalibarda repens, Robin-run-away.....	LC 210		X
Filipendula rubra, Queen-of-the-prairie.....	LC 270		P
Geum aleppicum, Yellow Avena.....	LC 284		P
Geum rivale, Water Avena.....	LC 851		T
Gillenia trifoliata, Bowman's-root.....	LC 290		T
Potentilla anserina, Silverweed.....	LC 852		T
Potentilla arguta, Tall Cinquefoil.....	LC C64		E
Potentilla fruticosa, Shrubby Cinquefoil.....	LC C65		P
Potentilla palustris, Marsh Fivefinger.....	LC 853		T
Potentilla paradoxa, Bushy Cinquefoil.....	LC 854		T

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ROSACEAE. Rose Family (Cont'd.)			
Prunus nigra, Canada Plum.....	LC 857		E
Prunus pumila, Great Lakes Sand Cherry.....	LC 858		X
Prunus susquehannae, Sand Cherry.....	LC 859		E
Pyrus angustifolia, Narrow-leaved Crab.....	LC 860		X
Pyrus decora, Western Mountain-ash.....	LC 861		E
Rosa arkansana, Arkansas Rose.....	LC 862		X
Rosa blanda, Smooth Rose.....	LC A41		T
Rubus hispidus var. hispidus, Large Hispid Dewberry.....	LC C66		X
Rubus idaeus var. strigosus, Wild Red Raspberry.....	LC 608		P
Rubus pubescens, Dwarf Red Bramble.....	LC C67		T
Rubus trivialis, Southern Dewberry.....	LC 863		X
Sanguisorba canadensis, Canadian Burnet.....	LC C68		P
Spiraea latifolia, Northern Meadow-sweet.....	LC 864		X
Waldsteinia fragarioides, Barren Strawberry.....	LC C69		P
LEGUMINOSAE (FABACEAE). Pea Family			
Astragalus neglectus, Cooper's Milk-vetch.....	LD 865		X
Baptisia australis, Blue False Indigo.....	LD 077		E
Baptisia leucantha, Prairie False Indigo.....	LD X59		P
Clitoria mariana, Butterfly-pea.....	LD 866		T
Desmodium illinoense, Prairie Tick-trefoil.....	LD 867		E
Desmodium pauciflorum, Few-flowered Tick-trefoil.....	LD 868		T
Desmodium sessilifolium, Sessile Tick-trefoil.....	LD 869		E
Galactia volubilis, Milk-pea.....	LD 870		E
Lathyrus maritimus (L. japonicus var. glaber), Inland Beach-pea.....	LD 871		T
Lathyrus ochroleucus, Yellow Vetchling.....	LD 872		E
Lathyrus venosus, Wild Pea.....	LD 873		X
Lupinus perennis, Wild Lupine.....	LD 874		P
Phaseolus polystachios, Wild Kidney Bean.....	LD 875		T
Psoralea psoralioides, False Scurf-pea.....	LD 876		T
Trifolium reflexum, Buffalo Clover.....	LD 878		X
Trifolium stoloniferum, Running Buffalo Clover.....	LD 879		X
LINACEAE. Flax Family			
Linum sulcatum, Grooved Flax.....	LY 880		P
OXALIDACEAE. Wood-sorrel Family			
Oxalis montana, White Wood-sorrel.....	LX 881		X
POLYGALACEAE. Milkwort Family			
Polygala cruciata, Cross-leaved Milkwort.....	LZ 882		E
Polygala curtissii, Curtiss' Milkwort.....	LZ 883		E
Polygala incarnata, Pink Milkwort.....	LZ 884		E
Polygala paucifolia, Gay-wings.....	LZ 536		E
Polygala polygama, Racemed Milkwort.....	LZ 885		E
EUPHORBIACEAE. Spurge Family			
Acalypha rhomboidea var. deamii, Deam's Three-seeded Mercury.....	LS 886		E
Croton glandulosus, Northern Croton.....	LS 888		T
Euphorbia polygonifolia, Seaside Spurge.....	LS 890		P
Euphorbia purpurea, Glade Spurge.....	LS 269		X
Euphorbia serpens, Roundleaf Spurge.....	LS 891		E

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EUPHORBIACEAE. Spurge Family (Cont'd.)			
Phyllanthus carolinianus, Carolina Leaf-flower.....	LS 892		E
CALLITRICHACEAE. Water-starwort Family			
Callitriche deflexa, Austin's Water-starwort.....	NJ 893		T
Callitriche verna (C. palustris), Water-starwort.....	NJ 894		T
ANACARDIACEAE. Sumac Family			
Rhus aromatica var. arenaria, Beach Sumac.....	LW 895		X
Rhus vernix, Poison Sumac.....	LW C70		P
AQUIFOLIACEAE. Holly Family			
Ilex opaca, American Holly.....	LQ 896		E
Nemopanthes mucronata, Catberry.....	LQ C71		P
CELASTRACEAE. Staff-tree Family			
Euonymus americanus, American Strawberry-bush.....	LP 897		T
Pachistima canbyi, Cliff-green.....	LP 477		E
ACERACEAE. Maple Family			
Acer pensylvanicum, Striped Maple.....	LV 001		E
RHAMNACEAE. Buckthorn Family			
Ceanothus herbaceus (C. ovatus), Prairie Redroot.....	LT 146		E
Rhamnus alnifolia, Alder-leaved Buckthorn.....	LT 576		P
Rhamnus caroliniana, Carolina Buckthorn.....	LT 577		T
VITACEAE. Grape Family			
Vitis baileyana, Possum Grape.....	LU 898		E
Vitis cinerea, Pigeon Grape.....	LU C72		T
Vitis labrusca, Northern Fox Grape.....	LU C73		P
MALVACEAE. Mallow Family			
Sida hermaphrodita, Virginia Mallow.....	KD 899		T
HYPERICACEAE (GUTTIFERAE). St. John's Wort Family			
Hypericum boreale, Northern St. John's-wort.....	KC 900		E
Hypericum canadense, Canadian St. John's-wort.....	KC 901		T
Hypericum denticulatum, Coppery St. John's-wort.....	KC 902		E
Hypericum ellipticum, Few-flowered St. John's-wort.....	KC 903		X
Hypericum gymnanthum, Least St. John's-wort.....	KC 904		X
Hypericum hypericoides (Ascyrum hypericoides), St. Andrew's Cross.....	KC C74		P
Hypericum kalmianum, Kalm's St. John's-wort.....	KC 905		T
Hypericum majus, Tall St. John's-wort.....	KC 906		T
Hypericum tubulosum (including H. walteri), Large Marsh St. John's-wort.....	KC 907		T
CISTACEAE. Rockrose Family			
Helianthemum bicknellii, Plains Frostweed.....	KK 309		T
Helianthemum canadense, Canada Frostweed.....	KK 909		T
Hudsonia tomentosa, Beach-heather.....	KK 339		X

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CISTACEAE. Rockrose Family (Cont'd.)			
Lechea intermedia, Round-fruited Pinweed.....	KK A45		T
Lechea leggettii, Leggett's Pinweed.....	KK 910		E
Lechea minor, Thyme-leaf Pinweed.....	KK 911		E
Lechea stricta, Prairie Pinweed.....	KK 912		X
Lechea tenuifolia, Narrow-leaved Pinweed.....	KK A46		T
Lechea villosa, Hairy Pinweed.....	KK C75		T
VIOLACEAE. Violet Family			
Viola hirsutula, Southern Wood Violet.....	KH C76		P
Viola lanceolata, Lance-leaved Violet.....	KH 913		E
Viola missouriensis, Missouri Violet.....	KH 914		X
Viola nephrophylla, Northern Bog Violet.....	KH 915		T
Viola pallens, Northern White Violet.....	KH C77		T
Viola pedata, Bird-foot Violet.....	KH 753		T
Viola pedatifida, Prairie Violet.....	KH 916		X
Viola primulifolia, Primrose-leaved Violet.....	KH 917		E
Viola rotundifolia, Round-leaved Violet.....	KH 918		P
Viola tripartita var. glaberrima, Three-parted Violet....	KH 754		E
Viola tripartita var. tripartita, Three-parted Violet....	KH 754		E
Viola walteri, Walter's Violet.....	KH 920		E
PASSIFLORACEAE. Passion-flower Family			
Passiflora incarnata, Passion-flower.....	KJ 921		T
CACTACEAE. Cactus Family			
Opuntia compressa (O. humifusa), Prickly Pear.....	JM C78		P
ELAEAGNACEAE. Oleaster Family			
Shepherdia canadensis, Canadian Buffalo-berry.....	LL 922		T
MELASTOMATACEAE. Melastoma Family			
Rhexia virginica, Virginia Meadow-beauty.....	LK 581		T
ONAGRACEAE. Evening-primrose Family			
Epilobium angustifolium, Fireweed.....	LJ E99		P
Epilobium strictum, Simple Willow-herb.....	LJ 923		T
Oenothera pilosella, Meadow Sundrops.....	LJ 925		P
Oenothera triloba, Sessile Evening-primrose.....	LJ 924		X
HALORAGACEAE. Water-milfoil Family			
Myriophyllum exalbescens, American Water-milfoil.....	LF 926		P
Myriophyllum heterophyllum, Two-leaved Water-milfoil....	LF 927		E
Myriophyllum verticillatum, Green Water-milfoil.....	LF 928		X
ARALIACEAE. Ginseng Family			
Aralia hispida, Bristly Sarsaparilla.....	L2 929		X
Aralia spinosa, Devil's-walkingstick.....	L2 C79		P
Panax quinquefolius, American Ginseng.....	L2 480		P
UMBELLIFERAE (APIACEAE). Parsley Family			
Chaerophyllum procumbens var. shortii, Short's Chervil...	L3 930		P
Eryngium yuccifolium, Rattlesnake-master.....	L3 932		T

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UMBELLIFERAE (APIACEAE). Parsley Family (Cont'd.)			
Hydrocotyle americana, American Water-pennywort.....	L3 343		P
Hydrocotyle umbellata, Navelwort.....	L3 933		E
Ligusticum canadense, American Lovage.....	L3 934		E
Perideridia americana, Perideridia.....	L3 503		E
Thaspium pinnatifidum, Cut-leaf Meadow-parsnip.....	L3 718		T
CORNACEAE. Dogwood Family			
Cornus canadensis, Bunchberry.....	LM 935		T
Cornus rugosa, Round-leaved Dogwood.....	LM A94		T
PYROLACEAE. Pyrola Family			
Chimaphila umbellata, Pipsissewa.....	KQ 153		T
Pyrola secunda, One-sided Wintergreen.....	KQ 936		X
ERICACEAE. Heath Family			
Andromeda glaucophylla, Bog-rosemary.....	KQ 030		X
Arctostaphylos uva-ursi, Bearberry.....	KQ 937		X
Chamaedaphne calyculata, Leather-leaf.....	KQ 938		P
Gaultheria hispidula, Creeping Snowberry.....	KQ 939		X
Ledum groenlandicum, Labrador-tea.....	KQ 940		E
Lyonia ligustrina, Maleberry.....	KQ 941		X
Rhododendron calendulaceum, Flame Azalea.....	KQ 942		E
Rhododendron maximum, Great Rhododendron.....	KQ 943		T
Rhododendron nudiflorum, Pinxter-flower.....	KQ 944		T
Rhododendron roseum, Northern Rose Azalea.....	KQ 588		P
Vaccinium atrococcum, Black Highbush Blueberry.....	KQ C80		T
Vaccinium caesium, Small Deerberry.....	KQ 945		E
Vaccinium macrocarpon, Large Cranberry.....	KQ 746		P
Vaccinium myrtilloides, Velvet-leaf Blueberry.....	KQ 946		X
Vaccinium oxycoccos, Small Cranberry.....	KQ 747		E
PRIMULACEAE. Primrose Family			
Dodecatheon meadia, Shooting-star.....	KW 225		P
Hottonia inflata, Featherfoil.....	KW 334		E
Trientalis borealis, Star-flower.....	KW 730		P
STYRACACEAE. Storax Family			
Halesia carolina, Silverbell.....	KU 304		E
Styrax americana, Snowbell.....	KU 948		E
Styrax grandifolia, Bigleaf Snowbell.....	KU 949		X
OLEACEAE. Olive Family			
Chionanthus virginicus, Fringe-tree.....	NN 950		E
Fraxinus tomentosa, Pumpkin Ash.....	NN 951		X
GENTIANACEAE. Gentian Family			
Bartonia virginica, Yellow Bartonia.....	NB C81		P
Gentiana alba (G. flavida), Yellowish Gentian.....	NB 281		E
Gentiana clausa, Closed Gentian.....	NB 952		E
Gentiana crinita, Fringed Gentian.....	NB 283		T
Gentiana procera, Small Fringed Gentian.....	NB C82		P
Gentiana puberulenta (G. puberula), Prairie Gentian.....	NB 953		E
Gentiana quinquefolia, Stiff Gentian.....	NB X60		P

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GENTIANACEAE. Gentian Family (Cont'd.)			
Gentiana saponaria, Soapwort Gentian.....	NB 954		E
Gentiana villosa, Sampson's Snakeroot.....	NB 955		E
Obolaria virginica, Pennywort.....	NB C83		P
Swertia caroliniensis, American Columbo.....	NB 705		P
MENYANTHACEAE (GENTIANACEAE). Buckbean Family			
Menyanthes trifoliata, Buckbean.....	NB 448		E
APOCYNACEAE. Dogbane Family			
Apocynum sibiricum (incl. var. cordigerum), Clasp- leaf Dogbane.....	NC 956		P
ASCLEPIADACEAE. Milkweed Family			
Asclepias amplexicaulis, Bluntleaf Milkweed.....	ND C84		P
Asclepias variegata, White Milkweed.....	ND C85		T
Asclepias viridis (Asclepiodora viridis), Spider Milkweed.....	ND 957		T
Matalea obliqua (Gonolobus obliquus), Angle-pod.....	ND C24		P
CONVOLVULACEAE. Morning-glory Family			
Cuscuta compacta, Sessile Dodder.....	NE 958		T
Cuscuta coryli, Hazel Dodder.....	NE 959		T
Cuscuta glomerata, Glomerate Dodder.....	NE 960		X
Cuscuta pentagona, Five-angled Dodder.....	NE 961		T
POLEMONIACEAE. Phlox Family			
Phlox glaberrima, Smooth Phlox.....	NF 962		T
Phlox ovata, Mountain Phlox.....	NF 963		T
Phlox stolonifera, Creeping Phlox.....	NF 964		P
Polemonium reptans var. villosum, Braun's Jacob's-ladder.....	NF 531		P
HYDROPHYLLACEAE. Waterleaf Family			
Phacelia bipinnatifida, Fern-leaf Scorpion-weed.....	NG 965		T
Phacelia dubia, Small-flowered Scorpion-weed.....	NG 508		X
Phacelia ranunculacea, Blue Scorpion-weed.....	NG 510		E
BORAGINACEAE. Borage Family			
Cynoglossum boreale, Northern Wild Comfrey.....	NH 966		X
Lithospermum carolinense, Carolina Puccoon.....	NH 967		P
Myosotis macrosperma, Bristly Scorpion-grass.....	NH 968		T
Onosmodium hispidissimum, False Gromwell.....	NH 969		P
LABIATAE (LAMIACEAE). Mint Family			
Collinsonia verticillata (Micheliella verticillata), Early Stoneroot.....	NL 170		E
Hedeoma hispida, Rough Pennyroyal.....	NL 970		E
Meehanian cordata, Meehanian.....	NL 444		P
Monarda punctata, Dotted Horsemint.....	NL 971		E
Pycnanthemum muticum, Blunt Mountain-mint.....	NL A96		T
Pycnanthemum pilosum, Hoary Mountain-mint.....	NL 972		E
Satureja arkansana, Limestone Savory.....	NL C88		P

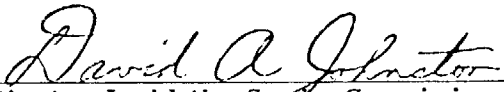
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LABIATAE (LAMIACEAE). Mint Family (Cont'd.)			
Scutellaria integrifolia, Hyssop Skullcap.....	NL C89		T
Scutellaria saxatilis, Rock Skullcap.....	NL 651		E
Scutellaria serrata, Showy Skullcap.....	NL C90		P
Synandra hispidula, Synandra.....	NL 708		T
Trichostema dichotomum var. lineare (T. setaceum), Narrow-leaved Bluecurls.....	NL 974		E
SCROPHULARIACEAE. Figwort Family			
Agalinis gattereri (Gerardia gattereri), Gattereri's Foxglove.....	NP 975		X
Agalinis paupercula var. paupercula (Gerardia paupercula var. paupercula), Small Purple Foxglove.....	NP 976		X
Agalinis paupercula var. borealis (Gerardia paupercula var. borealis), Northern Purple Foxglove.....	NP 976		X
Agalinis skinneriana (Gerardia skinneriana), Skinner's Foxglove.....	NP 977		E
Aureolaria pedicularia var. pedicularia (Gerardia pedicularia var. pedicularia), Woodland Fern-leaf False Foxglove.....	NP 978		X
Aureolaria pedicularia var. ambigens (Gerardia pedicularia var. ambigens), Prairie Fern-leaf False Foxglove.....	NP 978		E
Besseyia bullii (Wulfenia bullii), Besseyia.....	NP 979		X
Buchnera americana, Bluehearts.....	NP 980		E
Gratiola virginiana, Round-fruited Hedge-hyssop.....	NP 981		T
Gratiola viscidula var. shortii, Short's Hedge-hyssop....	NP 982		T
Linaria canadensis, Old-field Toadflax.....	NP 983		E
Melampyrum lineare, Cow-wheat.....	NP 984		T
Penstemon canescens, Gray Beard-tongue.....	NP 986		E
Penstemon laevigatus, Smooth Beard-tongue.....	NP 987		T
Penstemon pallidus, Downy White Beard-tongue.....	NP C91		T
Penstemon tubaeflorus, White-wand Beard-tongue.....	NP 988		X
Tomanthera auriculata (Gerardia auriculata), Ear-leaf Foxglove.....	NP 722		E
Veronica anagallis-aquatica, Brook-pimpernel.....	NP C92		P
BIGNONIACEAE. Bignonia Family			
Bignonia capreolata, Cross-vine.....	NZ C93		P
OROBANCHACEAE. Broomrape Family			
Orobanche ludoviciana, Louisiana Broom-rape.....	NQ 989		E
LENTIBULARIACEAE. Bladderwort Family			
Utricularia cornuta, Horned Bladderwort.....	NS 990		E
Utricularia gibba, Humped Bladderwort.....	NS A59		T
Utricularia intermedia, Flat-leaved Bladderwort.....	NS 991		T
Utricularia minor, Lesser Bladderwort.....	NS 992		T
ACANTHACEAE. Acanthus Family			
Ruellia caroliniensis, Carolina Ruellia.....	NR 993		P
Ruellia humilis, Low Ruellia.....	NR 611		P
PLANTAGINACEAE. Plantain Family			
Plantago cordata, Heart-leaf Plantain.....	NM 527	PE	E

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RUBIACEAE. Madder Family			
Galium labradoricum, Bog Bedstraw.....	NU 995		T
Galium palustre, Marsh Bedstraw.....	NU 996		E
Houstonia nigricans, Narrow-leaved Summer Bluets.....	NU C94		T
Houstonia purpurea, Large Summer Bluets.....	NU C95		P
Spermacoce glabra, Smooth Buttonweed.....	NU C96		P
CAPRIFOLIACEAE. Honeysuckle Family			
Linnaea borealis, American Twinflower.....	NV 402		X
Lonicera canadensis, Canada Fly-honeysuckle.....	NV 411		T
Lonicera flavida, Pale Yellow Honeysuckle.....	NV 997		X
Lonicera oblongifolia, Swamp Fly-honeysuckle.....	NV 998		X
Lonicera prolifera, Grape Honeysuckle.....	NV 999		T
Lonicera villosa, Mountain Fly-honeysuckle.....	NV A01		X
Symphoricarpos albus var. albus, Snowberry.....	NV A02		E
Viburnum alnifolium, Hobblebush.....	NV A03		T
Viburnum molle, Soft-leaved Arrow-wood.....	NV A04		E
Viburnum opulus var. americanum (V. trilobum), Highbush-cranberry.....	NV B07		P
Viburnum rufidulum, Southern Black-haw.....	NV A05		E
VALERIANA. Valerian Family			
Valeriana ciliata, Prairie Valerian.....	NW A06		E
CAMPANULACEAE. Bellflower Family			
Campanula rotundifolia, Harebell.....	NT B02		T
COMPOSITAE (ASTERACEAE). Composite Family			
Artemisia caudata, Beach Wormwood.....	NX K07		T
Aster acuminatus, Mountain Aster.....	NX K08		X
Aster dumosus, Bushy Aster.....	NX K09		T
Aster infirmus, Weak Aster.....	NX K11		T
Aster linariifolius, Stiff-leaf Aster.....	NX 069		T
Aster oblongifolius, Shale Barren Aster.....	NX K12		T
Aster ptarmicoides, Yarrow Aster.....	NX K13		E
Aster solidagineus (Sericocarpus linifolius), Narrow- leaved Aster.....	NX C14		T
Aster surculosus, Creeping Aster.....	NX K15		X
Cacalia muhlenbergii, Great Indian-plantain.....	NX K17		P
Cacalia tuberosa, Fen Indian-plantain.....	NX E02		T
Chrysogonum virginianum, Golden-knees.....	NX 155		T
Cirsium carolinianum, Carolina Thistle.....	NX K18		E
Cirsium hillii, Hill's Pasture Thistle.....	NX K19		E
Coreopsis major, Woodland Tickseed.....	NX K20		P
Echinacea purpurea, Purple Coneflower.....	NX 239		P
Erigeron divaricatus, Bushy Horseweed.....	NX K21		E
Eupatorium album, White Thoroughwort.....	NX K22		E
Eupatorium aromaticum, Small White Snakeroot.....	NX K23		E
Eupatorium hyssopifolium, Hyssop Thoroughwort.....	NX K24		E
Eupatorium incarnatum, Pink Thoroughwort.....	NX K25		E
Eupatorium rotundifolium (including E. pubescens), Roundleaf Thoroughwort.....	NX K26		P
Gnaphalium viscosum (G. macounii), Winged Cudweed.....	NX K27		X

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COMPOSITAE (ASTERACEAE). Composite Family (Cont'd.)			
Helianthus mollis, Ashy Sunflower.....	NX A63		T
Helianthus occidentalis, Western Sunflower.....	NX K28		T
Heterotheca mariana (Chrysopsis mariana), Golden-aster...	NX K30		P
Heterotheca graminifolia (Chrysopsis graminifolia), Silkgrass.....	NX K29		E
Hieracium canadense, Canada Hawkweed.....	NX K31		E
Hieracium marianum, Maryland Hawkweed.....	NX K32		X
Hymenoxys acaulis (Actinea herbacea), Lakeside Daisy.....	NX K33		E
Krigia dandelion, Potato-dandelion.....	NX K34		E
Krigia virginica, Dwarf Dandelion.....	NX K35		T
Kuhnia eupatorioides (including varieties; Brickellia eupatorioides), False Boneset.....	NX K16		P
Liatris cylindracea, Slender Blazing-star.....	NX E10		T
Liatris novae-angliae (L. novae-angliae var. nieuwlandii = X L. nieuwlandii in Fernald 1950), New England Blazing-star.....	NX A64		T
Liatris scabra, Large Blazing-star.....	NX K36		E
Liatris squarrosa, Scaly Blazing-star.....	NX K37		T
Megalodonta beckii, Water-marigold.....	NX K38		X
Pluchea camphorata, Camphorweed.....	NX A65		X
Prenanthes aspera, Rough Rattlesnake-root.....	NX K39		X
Prenanthes crepidinea, Nodding Rattlesnake-root.....	NX K40		T
Prenanthes racemosa, Prairie Rattlesnake-root.....	NX K41		T
Senecio pauperculus, Balsam Squaw-weed.....	NX 659		P
Silphium laciniatum, Compass-plant.....	NX E13		E
Solidago arguta, Cut-leaf Goldenrod.....	NX K42		E
Solidago odora, Sweet Goldenrod.....	NX K43		E
Solidago ohioensis, Ohio Goldenrod.....	NX K44		P
Solidago remota, Great Lakes Goldenrod.....	NX K45		T
Solidago riddellii, Riddell's Goldenrod.....	NX K46		P
Solidago rigida, Stiff Goldenrod.....	NX K47		P
Solidago squarrosa, Leafy Goldenrod.....	NX 683		T
Verbesina helianthoides, Hairy Wing-stem.....	NX K48		T
Verbesina occidentalis, Yellow Crownbeard.....	NX K49		E
Vernonia fasciculata, Prairie Ironweed.....	NX K50		X

APPENDIX C. Ohio Endangered Plant Law

The section numbering of law of a general and permanent nature is complete and in conformity with the Revised Code.


Director, Legislative Service Commission.

Filed in the office of the Secretary of State at Columbus,
Ohio, on the 24th day of May, A. D. 1978,


Secretary of State.

File No. 328.

Effective Date August 23, 1978.

(Amended Substitute House Bill No. 908)

AN ACT

To enact sections 1518.01 to 1518.05 and 1518.99
of the Revised Code to protect endangered
species of native Ohio wild plants.

Be it enacted by the General Assembly of the State of Ohio:

SECTION 1. That sections 1518.01, 1518.02, 1518.03, 1518.04, 1518.05, and 1518.99 of the Revised Code be enacted to read as follows:

Sec. 1518.01. WITH THE ADVICE OF THE NATURAL AREAS COUNCIL, THE CHIEF OF THE DIVISION OF NATURAL AREAS AND PRESERVES SHALL ADOPT AND MAY AMEND OR RESCIND RULES, IN ACCORDANCE WITH CHAPTER 119. OF THE REVISED CODE, SETTING FORTH CRITERIA FOR IDENTIFYING AND DESIGNATING SPECIES OF PLANTS NATIVE TO OHIO WHICH ARE IN DANGER OF EXTIRPATION OR WHICH ARE THREATENED WITH BECOMING ENDANGERED. THE CHIEF SHALL ADOPT AND MAY AMEND OR RESCIND RULES, IN ACCORDANCE WITH CHAPTER 119. OF THE REVISED CODE, SETTING FORTH A LIST OF THE PLANTS THAT HE DETERMINES TO BE ENDANGERED OR THREATENED WITH EXTIRPATION FROM THIS STATE, APPLYING THE CRITERIA SO DEVELOPED. THIS LIST SHALL IDENTIFY THE COMMON AND SCIENTIFIC NAMES OF EACH SPECIES. THE LIST SHALL INCLUDE ALL SPECIES NATIVE TO THIS STATE WHICH ARE LISTED ON THE "UNITED STATES LIST OF ENDANGERED AND THREATENED WILDLIFE AND PLANTS" PURSUANT TO THE "ENDANGERED SPECIES ACT OF 1973," 87 STAT. 884, 16 U.S.C. 1531-1543, AS AMENDED. FURTHER, THE CHIEF MAY PRODUCE FOR PUBLIC EDUCATION PURPOSES, LISTS OF PLANT SPECIES, WHICH SHALL INCLUDE THE NAMES OF SPECIES OF PLANTS, WHICH MAY BECOME THREATENED IN THE FUTURE THROUGH HABITAT LOSS, COMMERCIAL EXPLOITATION, OR OTHER MEANS.

Sec. 1518.02. NO PERSON SHALL WILLFULLY ROOT UP, INJURE, DESTROY, REMOVE, OR CARRY AWAY ON OR FROM PUBLIC HIGHWAYS, PUBLIC PROPERTY, OR WATERS OF

THE STATE, OR ON OR FROM THE PROPERTY OF ANOTHER, WITHOUT THE WRITTEN PERMISSION OF THE OWNER, LESSEE, OR OTHER PERSON ENTITLED TO POSSESSION, ANY ENDANGERED OR THREATENED PLANT LISTED BY RULE ADOPTED UNDER SECTION 1518.01 OF THE REVISED CODE.

Sec. 1518.03. WITH THE ADVICE OF THE NATURAL AREAS COUNCIL, THE CHIEF OF THE DIVISION OF NATURAL AREAS AND PRESERVES SHALL ADOPT AND MAY AMEND OR REPEAL RULES, IN ACCORDANCE WITH CHAPTER 119. OF THE REVISED CODE, RESTRICTING THE TAKING, POSSESSING, TRANSPORTATION, SALE, OFFERING FOR SALE, OR EXPOSURE FOR SALE, FOR COMMERCIAL PURPOSES OF NATIVE OHIO SPECIES OF WILD PLANTS OR PARTS THEREOF, THAT ARE LISTED AS ENDANGERED OR THREATENED BY RULE ADOPTED UNDER SECTION 1518.01 OF THE REVISED CODE. THE RULES MAY PROHIBIT THE TAKING OF ANY ENDANGERED OR THREATENED PLANT, OR PARTS THEREOF, FOR COMMERCIAL PURPOSES, FROM ANY WOOD LOT, FIELD, OR FOREST, OR FROM ANY OTHER LOCATION IN WHICH SUCH PLANT IS FOUND GROWING IN ITS NATIVE HABITAT. THIS SECTION DOES NOT PREVENT ANY NURSERYMAN OR DEALER WHO IS LICENSED UNDER CHAPTER 927. OF THE REVISED CODE, FROM SELLING, OFFERING FOR SALE, SHIPPING, OR OTHERWISE DISPOSING OF ANY ENDANGERED OR THREATENED PLANTS OR PARTS THEREOF WHEN SUCH PLANTS HAVE BEEN COMMERCIALY GROWN BY A LICENSED NURSERY OR LEGALLY IMPORTED INTO THIS STATE. FOR THE PURPOSES OF THIS SECTION, "COMMERCIAL PURPOSES" MEANS WITH INTENT TO SELL OR TRADE ENDANGERED OR THREATENED PLANTS FOR GAIN OR PROFIT. "COMMERCIALY GROWN" MEANS TO GROW PLANTS UNDER CULTIVATION IN TILLED PLOTS OR IN A GREENHOUSE.

THE RULES SHALL PROVIDE FOR THE TAKING OF SPECIES ENDANGERED OR THREATENED WITH STATE-WIDE EXTIRPATION FOR BOTANICAL, EDUCATIONAL, AND SCIENTIFIC PURPOSES, AND FOR PROPAGATION IN CAPTIVITY TO PRESERVE THE SPECIES, WITH WRITTEN PERMISSION FROM THE CHIEF. THE RULES SHALL NOT PROHIBIT THE TAKING OR POSSESSION OF SPECIES LISTED ON THE "UNITED STATES LIST OF ENDANGERED AND THREATENED WILDLIFE AND PLANTS" FOR BOTANICAL, EDUCATIONAL, OR SCIENTIFIC PURPOSES, OR FOR PROPAGATION IN CAPTIVITY TO PRESERVE THE SPECIES, UNDER A PERMIT OR LICENSE FROM THE UNITED STATES OR ANY INSTRUMENTALITY THEREOF.

Sec. 1518.04. THE DIRECTOR OF NATURAL RESOURCES MAY ENTER INTO AGREEMENTS OR CONTRACTS WITH THE

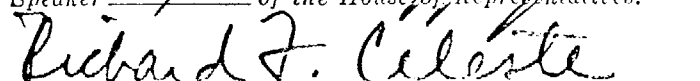
UNITED STATES GOVERNMENT FOR THE PROTECTION OF PLANT SPECIES PURSUANT TO THE "ENDANGERED SPECIES ACT OF 1973," 87 STAT. 884, 16 U.S.C. 1531-1543, AS AMENDED.

Sec. 1518.05. (A) NO PERSON SHALL VIOLATE A RULE ADOPTED OR CONDITION OF A PERMIT ISSUED UNDER SECTION 1518.03 OF THE REVISED CODE.

(B) THE ATTORNEY GENERAL, UPON THE REQUEST OF THE CHIEF OF THE DIVISION OF NATURAL AREAS AND PRESERVES, SHALL PROSECUTE ANY PERSON WHO VIOLATES SECTION 1518.02 OF THE REVISED CODE OR THIS SECTION.

Sec. 1518.99. (A) WHOEVER VIOLATES SECTION 1518.02 OF THE REVISED CODE IS GUILTY OF A MINOR MISDEMEANOR.

(B) WHOEVER VIOLATES SECTION 1518.05 OF THE REVISED CODE SHALL BE FINED NOT LESS THAN ONE THOUSAND DOLLARS NOR MORE THAN FIVE THOUSAND DOLLARS FOR HIS FIRST OFFENSE; FOR EACH SUBSEQUENT OFFENSE SUCH PERSON SHALL BE FINED NOT LESS THAN TWO THOUSAND DOLLARS NOR MORE THAN TEN THOUSAND DOLLARS.


Speaker _____ of the House of Representatives.

President _____ of the Senate.

Passed April 25, 1978

This bill was presented to the Governor May 11, 1978 and was not signed or returned to the House of Representatives wherein it originated within ten (10) days after being so presented, exclusive of Sundays and the day said bill was presented.

TED W. BROWN,
Secretary of State.

APPENDIX D. Data Services Brochure and Application Form

need to acquire written permission to publish information provided by the Heritage Program, and a requirement that the Division be given credit as the information source.

The Heritage staff will review the Data Request Form and will contact the prospective data user to answer any questions. A decision will be made about the level of detail necessary to adequately fulfill the data user's needs. A cost estimate for the data search can be given at this time if requested. This program does not charge for data services which result in no data being made available to the user. Charges for services rendered are made in order to recover actual costs to the Division of Natural Areas and Preserves.

The requested information will be retrieved from the Heritage data systems using the most cost-efficient methods, and will be provided to the user with specified restrictions. If the application for access to data is denied, a written explanation will be provided.

Information will not be provided by telephone or to drop-in visitors. Normally, data can be provided to users within two weeks of receipt of the Data Request Form.

Fee Structure for Heritage Services

Charges for services rendered are made in order to recover actual costs to the Division of Natural Areas and Preserves.

DATA USER	MANUAL SEARCHES	COMPUTER SEARCHES
Governmental Agencies - local, regional, state, federal.	No charge for first hour per month; thereafter \$10 per hour.	\$25 base fee + 2¢/line for first 300 lines; thereafter 1¢ per line.
Non-Gov't. Agencies, Organizations, Individuals.	\$12 per hour.	\$30 base fee + 2¢/line first 300 lines; thereafter 1¢ per line.

If no information is available on a search request, there will be no charge to the data user. Otherwise, minimum charge will be for one hour's work, except where a memorandum of agreement is involved. Heritage staff will determine the most cost-efficient search procedures for individual data user requests.

Memoranda of Agreement

Written agreements can be negotiated to offset fees for services. Data users providing useful information to the Heritage Program can obtain reduced or deferred fees. Contact the Heritage Administrator for details.

Billing Procedure

No prepayment is necessary for governmental agencies. Prepayment may be required for non-government data users. Invoices normally will be provided along with the data. Data users should indicate cost limitations they wish to place on requests for data. Fee estimates can be given prior to initiating searches.

FOR FURTHER INFORMATION, CONTACT:
Natural Heritage Program
Division of Natural Areas & Preserves
Fountain Square, Building F
Columbus, Ohio 43224
Phone: 614/466-8970

JAMES A. RHODES
Governor

ROBERT W. TEATER
Director

Division of Natural Areas & Preserves

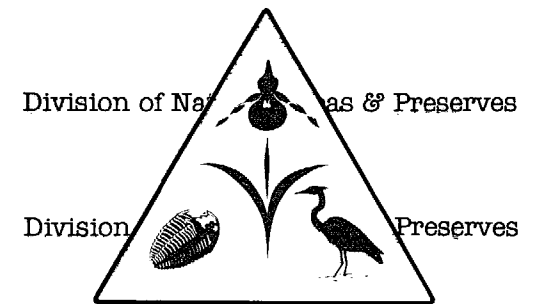
NATURAL

Division of Natural Areas & Preserves

Division of Natural Areas & Preserves

HERITAGE

Division of Natural Areas & Preserves



Division of Natural Areas & Preserves

DATA

Division of Natural Areas & Preserves

Division of Natural Areas & Preserves

SERVICES

Division of Natural Areas & Preserves



Ohio Department of Natural Resources

Data Services

In the summer of 1976, the Ohio Department of Natural Resources, in conjunction with The Nature Conservancy, established the Natural Heritage Program to systematically identify and help protect significant natural areas, high quality plant communities, rare species and unique geologic features. The Nature Conservancy operated the Natural Heritage Program until October 1977, when the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, assumed sole management.

A variety of individuals, institutions and organizations contributed biological data to the program, and while this information was provided free of charge, a substantial amount of time and money was necessary to process it into its current useable format. In all cases, information was supplied in the belief it would be used to help protect the rare and endangered plants, animals and associated natural features of Ohio. In some instances, locational information about rare and endangered species was provided, with the understanding that it would not be published or released for public distribution. These agreements of confidentiality with the individuals and institutions that contributed information must be honored.

If data users recognize that the purpose of the Natural Heritage Program is to protect these species and features, they will better understand why the program staff must carefully control the use of Heritage information. This does not mean the information is unavailable. In most cases, data can be provided for specific research projects, development or review of environmental impact statements, and other legitimate uses. However, data users must also realize that publication of exact locational information may not aid the protection of an endangered species, but may, in fact, contribute to its destruction. For example, publication of exact locations

for attractive, but endangered wildflowers may lead collectors to these sites. Such sensitive information is best restricted from publication.

The program's data management system includes manual and computer files which store pertinent information on rare and endangered species, plant communities and unique natural features. This is not a complete listing of all rare species, communities and natural features found in Ohio, but is Ohio's most complete single source of existing natural heritage information.

Sound environmental decisions cannot be made in ignorance of the facts. The Natural Heritage Program can provide some basic information needed to make better use of our natural resources, while maintaining the heritage of our natural diversity for future generations to enjoy.

What data are available?

Heritage data are grouped by class. According to the needs of the data user, locational information on U.S.G.S. topographic maps can be withdrawn for all classes, individual class, or parts of classes. The following breakdown summarizes each class:

SPECIAL PLANTS (560± SPECIES)

- Species with Federal status.
- Ohio Endangered and Threatened Plants (state official status).
- Plants having no legal status but considered potentially threatened in Ohio.

SPECIAL ANIMALS (175± SPECIES)

- Species with Federal status.
- Ohio Endangered Wild Animals (state official status).
- Animals having no legal status, but considered rare in Ohio.

PLANT COMMUNITIES (65± Community types) Native plant communities of high quality.

GEOLOGIC FEATURES (40± Features) Unique or high quality geologic features which

should be preserved for scientific and educational purposes.

REGISTRY - Information on State Nature Preserves; public or privately owned natural areas; and state wild, scenic and recreational rivers.

OTHER - A catchall class which includes information on bird roosts and rookeries, breeding animal populations and champion sized trees. These are natural features of statewide significance, but lack legal status.

In what format are the data available?

The manual, map and computer data systems are flexible and allow for searches which can include a number of variables. Computer printouts can be obtained for the following search criteria:

1. Geographic Area - County, physiographic region, watershed, subwatershed, topographic quad, or managed area. Manual searches can provide information for areas smaller than U.S.G.S. topographic maps or areas which include portions of topographic maps.
2. Species - Individual species, groups of species, taxonomically related species.
3. Plant community type - wetlands.
4. Status - Degree of endangerment or other special status. (For example, legal status only).
5. Date of Information.
6. Ownership.

Application Procedure

Prospective data users should obtain Data Request Forms from:

Heritage Data Services
Division of Natural Areas & Preserves
Fountain Square, Building F-1
Columbus, Ohio 43224

These forms request detailed information about the planned use of the data and require the data user to agree to certain restrictions. These restrictions include the

NATURAL HERITAGE PROGRAM
DATA REQUEST FORM

Please enclose: a) A letter formally requesting information from the
Natural Heritage Program.
b) Preliminary reports and maps detailing study area.

DATE _____

WHO IS REQUESTING THE INFORMATION?

Agency _____

Name and Title _____

Address _____

Phone _____

WHAT PROJECT OR PROGRAM IS THE INFORMATION FOR? IF THERE IS A CONTRACTING AGENCY,
PLEASE GIVE NAME, ADDRESS, PHONE NUMBER OF CONTACT PERSON.

For which groups in your study area do you want locational information?
Please check appropriate boxes.

Plants - ☐ Federal Status only
☐ State Legal Status only (endangered & threatened)
☐ Potentially Threatened (non-legal status)

Animals - ☐ Federal Status only
☐ State Legal Status (endangered) only
☐ Rare (non-legal)

Plant Communities - ☐ All ☐ Wetlands only
☐ Other (please specify) _____

Geologic Features - ☐ All

Other - ☐ (please specify) _____

Registry - ☐ All
☐ State Nature Preserves
☐ Natural Areas
☐ State Wild, Scenic and Recreational Rivers
☐ Other (please specify) _____

(over)

BESIDES NAME, LOCATION, AND STATUS, PLEASE SPECIFY ANY ADDITIONAL INFORMATION YOU MAY REQUIRE. _____

DESCRIBE THE LEVEL OF LOCATIONAL ACCURACY NECESSARY FOR YOUR PROJECT. _____

HOW WILL THE INFORMATION BE USED? _____

IN WHAT FORM AND DETAIL DO YOU WISH TO PUBLISH THIS INFORMATION? _____

The information supplied above is complete and accurate. Any material supplied by the Natural Heritage Program will not be published without prior written permission and without crediting the Division of Natural Areas and Preserves as the source of the material.

Signature _____

Return completed form to: Heritage Data Services, Division of Natural Areas & Preserves, Ohio Department of Natural Resources, Fountain Square, Building F, Columbus, Ohio 43224. Phone 614/466-8970.