

**The Vascular Flora of Outer Island**

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**A Thesis**

**Submitted in Partial Fulfillment of the**

**Requirements for the Degree of**

**Master of Arts**

**Central Connecticut State University**

**New Britain, Connecticut**

**August 1999**

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## ABSTRACT

The purpose of this study, on the Outer Island unit of the Stewart B. McKinney National Wildlife Refuge in Branford, CT, from July 1998 to June 1999, was to conduct botanical research and to make an associated collection of plant specimens. All non-cultivated vascular plants were collected and are on permanent loan to Central Connecticut State University. Forty-four species were collected including two conifers.

Details on possible herbal use of collected species are included, as well as information about edibility. In addition, information is presented regarding collected species that are included in the CT Department of Environmental Protection's non-native plant species policy and the President's executive order on invasive species. Possible eradication of these species from Outer Island is discussed.

## INTRODUCTION

Outer Island, one of the Thimble Islands, is approximately five acres in size and is the southernmost island of the Thimble Island chain. The island is located in Long Island Sound and its orientation is lengthwise approximately west to east measuring 250 meters long and 90 meters wide (Figure 1).

## HISTORICAL PERSPECTIVE

Historical records state that in 1614 a Dutch sailor, Adrian Black, discovered the islands. The islands were originally named "The Hundred Islands" although there are no records of the date of this discovery nor who named them (Hanna 1970). The first record of the islands being called The Thimble Islands seems to be in a deed of Branford town records dating back to 1739 (Hanna 1970). Tradition among locals accounts for the name because of the thimbleberry, or black raspberry, that once flourished on the islands.

Records indicate that Outer Island was also known as Two Tree Island. The island was first acquired by Abraham Page during the eighth and ninth division of land dating back to the 1700's. In 1776 the Frisbie family became owners of the island and Hanna states that the island was completely wooded. In 1781 residents of Branford voted to clear cut the Thimble Islands including Outer Island. They perceived a threat by British warships hiding in waters off the coast during the Revolutionary War (Hanna 1970).

Addison Verrill, a Yale professor, purchased the island in 1889 and made it his summer home for forty years. As a marine biologist, Verrill conducted marine life studies from the island with his students enrolled in Yale's Sheffield Scientific

School (Hanna 1970). Verrill built a house on the island, which was destroyed in a fire. The original fireplace and chimney from this house is incorporated in the house that presently occupies Outer Island. The chimney is still on navigational charts as a landmark (Hanna 1970).

#### CURRENT STATUS OF OUTER ISLAND

In a recent telephone interview Ms. Elizabeth Hird, wife of Bazil Rauch, shared more current information about Outer Island. Ms. Hird and her husband, originally from the mid-west, made their home in New York City where he was a professor at Barnard College. In 1964 they purchased the island as a vacation home (Photo 1). In the early years the Hirds made the two-hour commute from New York City on Thursdays and returned on Mondays. They had a boat of their own, but because of the quickly changing weather docked it at Stony Creek and instead relied on the Stony Creek ferry for transport to and from the island. In addition, they arranged for rides to and from the island with a carpenter they hired to work on their island house. Ms. Hird often worried about the carpenter's safety because his "boat" was a topless station wagon that was attached to a floatation device. Ms. Hird shopped locally and always felt secure enough on the island. One year she and her husband stayed on the island through winter. She related that they never felt unsafe because they had plenty of food and phone service that was provided in 1912 by The Southern New England Telephone Company.

Ms. Hird confirmed that she and her husband had soil barged out to the island when they first purchased it. Her husband felt that the island soil was depleted and had many weeds. They hired a caretaker and planted many cultivated, non-native species. At present, she confirmed that the caretaker comes out to the island to weed,

plant, mow grass and possibly fertilize. In addition, the Stony Creek ferry operator confirmed that he had brought the caretaker to the island in May for yard work.

In October of 1995 Ms. Hird donated Outer Island to the U. S. Fish and Wildlife Service in honor of her husband, Bazil Rauch. Long before the donation she allowed Dr. Harry Haakonsen, Director of the Center for the Environment at Southern Connecticut State University to conduct educational studies on the island. Her desire is to see the island's natural resources made available for environmental educational and scientific research. As a result of her donation Outer Island became the eighth unit of the Stewart B. McKinney National Wildlife Refuge.

Ms. Hird has an interesting arrangement with the U. S. Fish and Wildlife Service. She confirmed that she still visits the island and stays in her home while also making it available to her relatives for their use. During a recent June visit to the island, I encountered a relative of Ms. Hird. In a recent telephone conversation, Mr. William Kolodnicki, Refuge Manager for Outer Island, informed me that the relationship with Ms. Hird is working out well. In addition to the Rauch residence, a U. S. Fish and Wildlife structure occupies the island.

The McKinney refuge has a cooperative partnership with The Connecticut State University System (CSUS) which includes Central, Eastern, Southern and Western Connecticut State Universities. Under this arrangement the CSUS provides programs for the public and opportunities for scientific and environmental education. An important element of the island is to assure the well being of the migratory bird species that tend to utilize the coastal environments of Long Island Sound.

Thimble Islands and attribute it to a lack of fresh water. None of the islands has a pond, stream, spring or fresh water wetland. Outer Island has a well, but “may periodically experience seawater intrusion adversely affecting the potability of the well-water” (Gledhill 1997).

On visits to the island for collection purposes I witnessed various songbirds and was able to identify the call of Canada geese that were nesting on the island in protected areas.

information on medicinals. On the many occasions that I have visited, there are customers seeking advice on herbal preparations as an alternative to conventional medicine. This pharmacist works very closely with a large number of orthodox physicians in the surrounding area.

It appears that much of our knowledge about herbal remedies in the United States originates from Europe, which in turn had its beginnings in Egypt. George Ebers, a German of the late 19<sup>th</sup> century, was able to translate the inscriptions on a papyrus, which explained the medical practices of Egyptian doctors. Herbal medicine, faith healing and magic went a long way in producing positive results. Chinese and Indian herbal practices were around long before European practices. Dioscorides, a Greek surgeon, combined the knowledge of Greek, Egyptian and Roman medicine to write extensively on plant remedies. His writings were the basis of European herbal medicine for nearly fifteen hundred years (Coon 1963).

Although this knowledge was available, it was not until the printing press was invented in the fifteenth century that ancient herbal medicine and more current information was widely available for the layman (Coon 1963). One should not overlook the American Indian and his reliance on nature and plant based remedies to heal as an important contribution to American folk medicine. Our early English settlers may have had some limited knowledge of herbal remedies, but they became quickly aware of the expansive knowledge that the American Indian possessed concerning herbals. Because respected medicine men of a village did not easily share their knowledge, early records of curative properties are not well documented.

reason for seeking a patent seems to be to protect the general public from charlatans (Coon 1963).

Finally, it is important to note that herbal preparations should be considered medicines. Just because they are called “natural” does not mean they are safe. Potency and purity continues to be a problem since government scrutiny is not the same as with pharmaceutical drugs. Weiner (1980) stresses that the key to herbal remedies is subtlety. Positive effects of symptoms treated with herbals may not always be dramatic, but then neither are the side effects. If one chooses to purchase herbal remedies without guidance from an herbal practitioner, it is important to remember that more is not always better.

The following is information on herbal applications from plants found on Outer Island.

*Achillea millefolium* Yarrow

Native to Europe with some varieties native to our region

Used by ancient Greeks to stop bleeding and fever. Can be taken internally to induce sweating, lower blood pressure and as an anti-inflammatory. As a poultice it can be used to soothe minor cuts and abrasions. Helps regulate the menstrual cycle (Polunin et al. 1992).

Parts of plant used: Entire

Not to be used by pregnant women.



toxic, one should use caution when ingesting plants that contain this substance (Weiner 1980).

Leaves best gathered in summer.

*Hypericum punctatum* St. John's wort

Native of Europe

At present, St. John's wort is commonly seen advertised on television for the treatment of anxiety and mild depression. It is commonly used by homeopaths and is finding its way into mainstream medicine, even being suggested for patients by psychotherapists. It appears to lack side effects associated with antidepressant medications such as dry mouth, sexual dysfunction and headache. It is important to note that this herb should not be combined with any other prescribed antidepressant (Jalbert et al. 1999). Its herbal qualities date back to ancient Greece (Polunin et al. 1992). Clinical trials have been conducted that confirm its usefulness for these ailments (Chevallier 1996). It should be noted that livestock that graze on large quantities of this herb become photosensitive from hypericin found in the plant's red pigment. Persons using St. John's wort as an internal herbal should avoid extended periods of exposure to the sun.

Topically it is used for wounds, burns and infections, but may cause skin rash. Chinese herbalists use it for appendicitis, hepatitis, boils and snakebites. It is also used for relief of menopausal symptoms due to hormonal changes (Chevallier 1996).

In Montana, persons can be fined for propagating St. John's wort (Mason 1999). It is a vigorous grower that spreads by rhizomes and can outcompete native vegetation. Birds also spread its seeds. Although herbal guides encourage readers to

The flowers are used to relieve coughs and as an antispasmodic while the bark is used to treat gout, kidney stones, liver problems and as a diuretic. The leaves have astringent properties and can be boiled to use as a mouthwash or gargle for sore throats and cold sores (Chevallier 1996).

Parts of plant used: Leaves, bark and flowers

Berries are toxic.

### *Myrica* Bayberry

Native to North America

Used as an astringent and treatment for diarrhea, dysentery, jaundice and sore and bleeding gums (Coon 1963). Also taken as an infusion and warm drink. Bark in powder form can be used for nasal congestion.

Parts of plant used: root and bark

Best collected in September

### *Oenothera* spp. Evening Primrose

Native to North America

Rich in essential oils often combined with vitamin E to prevent oxidation (Chevallier 1996). Astringent effect and sedative properties. Used in treatment of whooping cough, digestive problems, asthma and lowering blood pressure. Oil from plant used externally for the treatment of eczema and breast tenderness. Evening primrose oil for women with menopausal symptoms is harvested from *Oenothera biennis*.

Parts of plant used: Includes leaves, stems, bark, flowers and seed oil

*Rosa rugosa*

(Photo 20)

Native of eastern Asia

Rose hips are a major source of Vitamin C. During World War II the English and Scandinavians relied solely on rose hip jam for their Vitamin C in the absence of citrus fruits (Coon 1963). The petals may be used as an astringent and to formulate rose oil.

Best collected in September

*Rumex acetosella* Sheep sorrel

Native to Europe

Commonly added as a green to salads. Used in soups in France (Coon 1963). Is an ingredient in an anti-cancer cream known as essiac (Chevallier 1996).

Parts of plant used: All above ground

Best collected in June.

*Rumex obtusifolius* Dock

Native to Europe and Africa

Used as a treatment for skin conditions including eczema, psoriasis and fungal infections. Used as a purgative because of its mild laxative effect, constipation and an internal cleansing agent, which also stimulates bile flow. For acne it is applied as a tincture (Chevallier 1996).

Parts of plant used: Dried root

*Taraxacum officinale* Dandelion

Native to Eurasia

Writings suggest the Egyptians used it. Arabian physicians used it medically in the 10<sup>th</sup> century. They assigned it the scientific name of *Taraxacon*, which was later adapted by Linnaeus. It was used by Native Americans for chest pain and to speed the recovery of broken bones (Anon. 1993). The leaves are used as a diuretic, while the roots can be used as a tincture to stimulate digestion. It is used as a simple bitter, laxative and liver tonic. The sap from the roots is used for warts. The leaves of the plant can be added to a salad as an additional green and dandelion wine is also a common product. Treatments include high blood pressure, gall bladder inflammation and prevention of gallstones, liver, kidney and skin conditions. It detoxifies and promotes bile flow (Jalbert et al.1999).

Most homeowners consider dandelion to be a lawn nuisance and spend many dollars to eradicate it along with other weedy species. It is a foreign pest that we consider a natural part of our landscape (Devine 1998). In America, it is listed in the National Formulary as a drug where it was classified for 100 years (Coon 1963).

Parts of plant used: Leaves, flowers and roots

Best collected in May.

*Verbascum thapsus* Mullein

Native to Europe, now naturalized in the U.S.

Used to treat cattle for pulmonary ailments. In humans, it is used for coughs, colds, warts, hemorrhoids and gout. The leaves have a high concentration of mucilage and can be boiled in hot vinegar and applied to the skin externally for

*Amelanchier*

The berries can be gathered and eaten directly. They can also be prepared as a sauce served hot or cold. They can be used in pie recipes, but should be cooked before adding to the pie filling. The American Indians gathered and dried the berries for future use by putting them on trays in the sun.

*Barbarea vulgaris* winter cress

Used as fresh salad greens by gathering in the early spring when the weather is still cold to eliminate bitterness in the leaves. The greens can also be blanched and served as one might serve spinach. As the season progresses and the plant sets bud the bud clusters can be gathered and used as a wild broccoli.

*Carya ovata* Shagbark hickory

This tree produces excellent nuts, which can easily be gathered from the ground. A hammer is necessary to crack them open, but then they can be eaten raw. Gibbons (1962) includes many recipes that include hickory nuts. Native Americans used the hickory nut to make nut milk.

*Polygonum cuspidatum* Japanese Knotweed

Gibbons (1962) begins his chapter on Japanese Knotweed with a warning on the ability of this invasive to spread wherever it has the opportunity. This is a common plant on Outer Island.

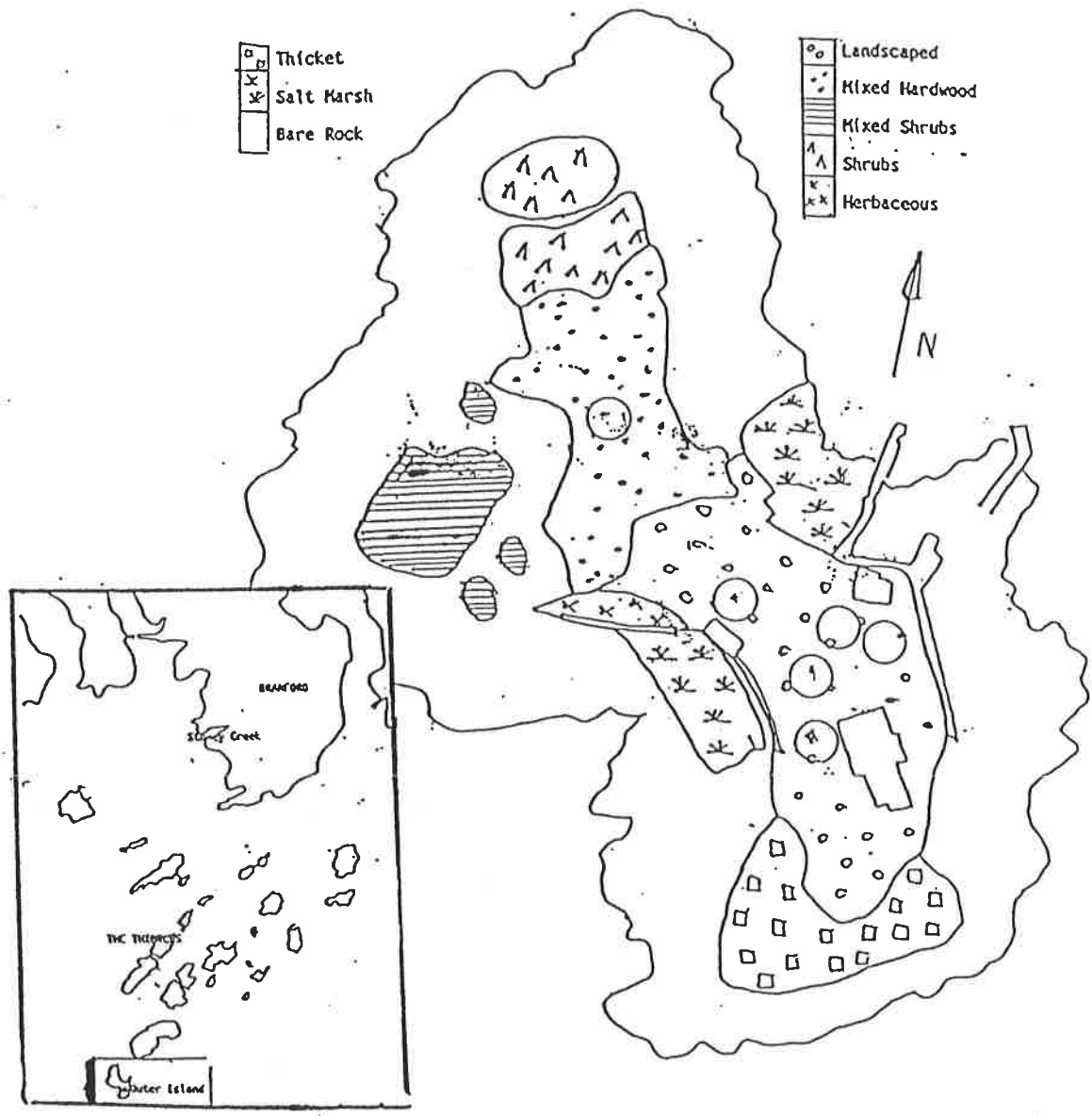
The flowers can be collected when in full bloom and used in dried flower arrangements. The young shoots are the food source. The tips of the shoots, before

## MATERIALS AND METHODS

I have followed the nomenclature in Gleason and Cronquist (1991). In addition, many other sources were used for reference including Bransfield and Meisel, Brown (1979), Graves (1956), Holmgren (1998), Little (1980), McDonnell (1979 and 1981), Newcomb (1977) and Niering and Olmstead (1979).

While I collected and observed the flora on Outer Island for one year, there is no doubt that many taxa have not been collected due to access limitations (Figure 2). In addition, I did not collect in areas around the residence because it is professionally landscaped with primarily cultivated species (Figure 3). Although I intended to collect only non-cultivated, native species, it became apparent that it was necessary to collect non-natives so as to have a true representation of vascular plants on the island. In addition, I observed, but did not collect one common species of Asclepiadaceae because it was not in flower and identification to species would have been difficult at best.

The plants are listed by family and alphabetically by scientific name. The flora was documented by means of voucher specimens preserved according to standard herbarium techniques (Hill 1995). These voucher specimens have been deposited in the Central Connecticut State University herbarium in New Britain, CT. All specimens cited were collected by the author, sometimes with others including T. Mione and P. Renda.



**OUTER ISLAND**

Figure 3

## BRASSICACEAE

\**Barbarea vulgaris* R. Br. Occasional.

*Draba reptans* (Lam.) Fern. Locally frequent.

\**Lepidium campestre* (L.) R. Br. Cress. Scarce.

## CARYOPHYLLACEAE

\**Silene latifolia* Poiret Scarce.

## CAPRIFOLIACEAE

\**Lonicera japonica* Thunb. Japanese honeysuckle. Frequent.

## CLUSIACEAE

\**Hypericum punctatum* Lam. Spotted St. John's wort. Occasional.

## COMMELINACEAE

*Tradescantia ohiensis* Raf. Spiderwort. Occasional.

## CRASSULACEAE

\**Sedum acre* L. Locally frequent.

## CUPRESSACEAE

*Juniperus virginiana* L. Cedar. Scarce.

## FABACEAE

*Strophostyles helvola* (L.) Elliott. Bean. Occasional to frequent.

## JUGLANDACEAE

*Carya ovata* (Miller) K. Koch. Shagbark hickory. Occasional.

## LAURACEAE

*Sassafras albidum* (Nutt.) Nees. Locally frequent.

## LILIACEAE

*Erythronium americanum* Ker Gawler Trout-lily. Infrequent.



## ROSACEAE

*Amelanchier spicata* (Lam.) K. Koch Shadbush. Scarce.

*Prunus maritima* Marshall. Beach plum.

\**Rosa rugosa* Thunb. Frequent.

## SCROPHULARIACEAE

\**Verbascum thapsus* L. Mullein. Occasional.

## VIOLACEAE

\**Viola sororia* Willd. Violet. Occasional.

## VITACEAE

*Parthenocissus quinquefolia* (L.) Planchon. Virginia creeper. Locally abundant.  
(Photo 22)

Of the forty-four species collected on Outer Island, 25 specimens or 57% were native while 19 specimens or 43% were non-native.

It is important to note that some species of *Phragmites australis* may be native. At a May 1998 workshop at the University of Connecticut, conducted by Dr. Leslie J. Mehrhoff, Curator of the George Safford Torrey Herbarium, Dr. Mehrhoff personally communicated that native and non-native species are virtually indistinguishable from each other in the Connecticut flora. *P. australis* is very common, widespread and aggressive and often occurs in small populations wherever it can grow.

During observation and collection on Outer Island, no ferns or fern allies were found. Lack of establishment by the ferns is the result of an unfavorable environment on the island due to its lack of moisture and rocky nature.

through various approaches including removal, while working directly with private landowners for a successful outcome.

The U. S. Fish and Wildlife Service has traditionally regulated the importation of injurious fish and wildlife. It also is responsible for preventing their interstate spread. A large portion of their budget is spent on fish hatcheries and stocking lakes with desirable fish for fishermen (Devine 1998). Although a small amount of their budget is devoted to invasives species, there is a government agency whose main mission is to prevent the entry and spread of exotics. The agency is known as the Animal and Plant Health Inspection Service (APHIS) with a budget of a half-billion dollars per year and is part of the U. S. Department of Agriculture (Devine 1998). APHIS has come under criticism from the Weed Science Society of America for not being aggressive enough in its involvement and control of invasive species. Robert Eplee, a senior research scientist for APHIS comments that "APHIS does not have the slightest idea how effective, or ineffective, our inspection systems are." He said that APHIS just assumes that they are intercepting most invaders (Devine 1998). R. Westbrooks, the national weed coordinator for APHIS and the liaison between the Interior and Agriculture departments believes that the U. S. Fish and Wildlife Service is in a good position to increase its number of inspectors and take over the responsibility for the environment, although he is not very optimistic that this will take place (Devine 1998).

There is reason for optimism. On February 3, 1999 President William Clinton issued an executive order on invasive species. It defines "alien species" with respect to a particular ecosystem, as any species that is capable of propagating and is not

*Rosa rugosa* is very successful and a common dweller of the sandy shores, as well as poison ivy, sumac, bayberry, and beach plum. He also comments on a number of invasive species that are found on Outer Island and listed in the CT D.E.P. invasive species list.

On examination of the April 1999 list of invasive species issued by the State of CT Department of Environmental Protection, seven of the species collected are found on Outer Island.

They are:

*Acer platanoides*, commonly known as Norway maple

*Ligustrum ovalifolium*, commonly known as California privet

*Lonicera japonica*, commonly known as Japanese Honeysuckle

*Phragmites australis*, commonly known as Common Reed

*Polygonum cuspidatum*, commonly known as Japanese Knotweed

*Rumex acetosella*, commonly known as Sheep Sorrel

*Vincetoxicum nigrum*, commonly known as Black Swallow-wort

While collecting and observing on the island it was obvious that *Polygonum cuspidatum* is a threat to the native plants on the island. Of the remaining six invasives on the island, some are more prevalent than others. *Ligustrum ovalifolium* is very common in the open grassy area of the island and was probably planted by the island owners. Based on the checklist of vascular flora of Outer Island done in 1986 by Brown and Sharp, it is apparent that these invasives have been present for some time.

genetic damage in human blood cells as well as damage to fruit flies. In addition, it is acutely toxic and causes many symptoms, which include eye and skin irritations, cardiac depression, vomiting, gastrointestinal pain and accumulation of excess fluid in the lungs (Cox 1995). Glyphosate is the eighth most commonly used herbicide in U.S. agriculture and second most common in non-agricultural settings (Cox 1995). In addition, residues of the herbicide have been detected in soil over a year. It can drift away from the site of its application and it is important to remember that runoff of this chemical would end up in Long Island Sound or in the well water on the island. Glyphosate has been implicated in sublethal effects on fishes (Cox 1995). "Damage to perennial plants (when not exposed to enough glyphosate to kill them) is persistent, with some symptoms lasting several years" (Cox 1995). The risk to native species may be too great.

The U.S. Fish and Wildlife Service has identified the longhorn beetle as an endangered insect species and its existence (if on the island) would be in jeopardy by the use of glyphosate. The herbicide can have an indirect impact on birds. Using it creates dramatic changes in the plant communities, which in turn affects birds that depend on plants for food, shelter and nesting support (Cox 1995). Outer Island has only been under the direction of the U.S. Fish and Wildlife Service for four years and it is beyond the scope of this paper to discuss the success thus far of their bird nesting sites, but it would seem to be a step backwards to entertain the use of chemical control on the island without trying the author's previously preferred method. Invasive species are a significant problem on Outer Island and I recommend manual removal, not chemical solutions.

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## ACKNOWLEDGEMENTS

I would like to thank Dr. Thomas Mione, Dr. Leeds M. Carluccio and Dr. Douglas Carter, faculty at Central Connecticut State University, who served on my master's thesis committee

I would like to thank Dr. Thomas Mione, professor at Central Connecticut State University for his support, patience and gentle guidance in making my collection on Outer Island a successful and educational experience. His floristic knowledge was invaluable. Dr. Steven R. Hill, Associate Research Scientist at the Illinois Natural History Survey, was a valuable resource in identification of some species collected.

Dr. Clayton Penniman, professor at Central Connecticut State University aided my work with photographs and names of contacts that allowed me to research the history of the island more fully. Many thanks go to Ms. Elizabeth Hird for taking time to talk to me about her experiences on Outer Island and its historical perspective. Thanks are extended to Mr. William Kolodnicki, Refuge Manager for the Stewart B. McKinney National Wildlife Refuge Outer Island Unit, who arranged for me to speak directly with Ms. Elizabeth Hird.

Ms. Susan Haakonsen, of Friends of Outer Island, was extremely helpful in sharing knowledge of the island and scientific papers that were compiled through grants from the Harry O. Haakonsen fellowship.

Dr. Leslie J. Mehrhoff, Curator of the G. S. Torrey Herbarium at the University of Connecticut, Storrs, made available previously compiled lists of vascular flora identified on Outer Island.



SIGN ALERTING VISITORS TO NESTING  
SITES ON OUTER ISLAND

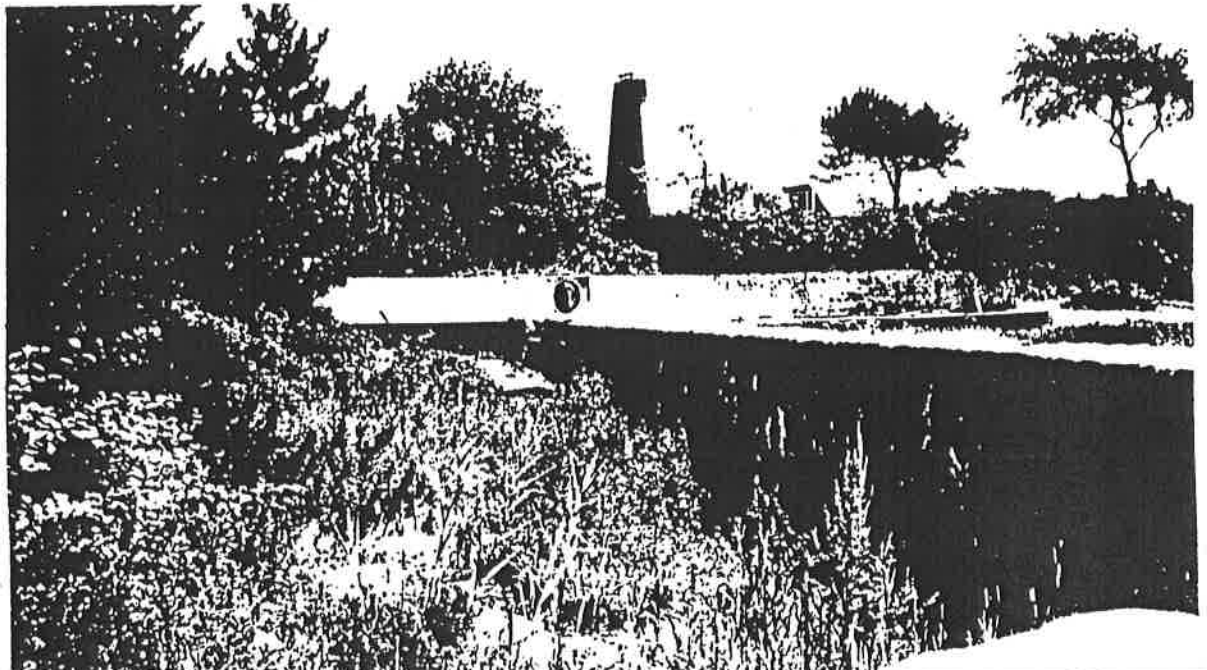


Dr. TOM MIONE ON A VISIT TO  
OUTER ISLAND

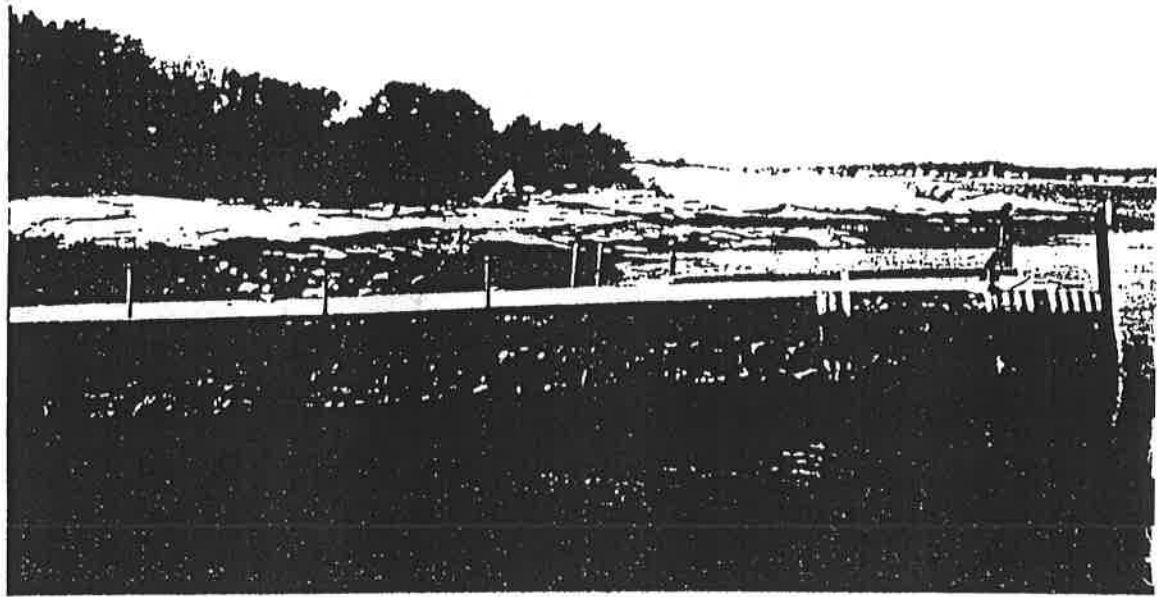


RETAINING WALLS ON OUTER ISLAND

PHOTOS 8 and 9







OUTER ISLAND DOCK

photo 12

BELOW:

ADDITIONAL VIEW OF OUTER ISLAND

photo 13





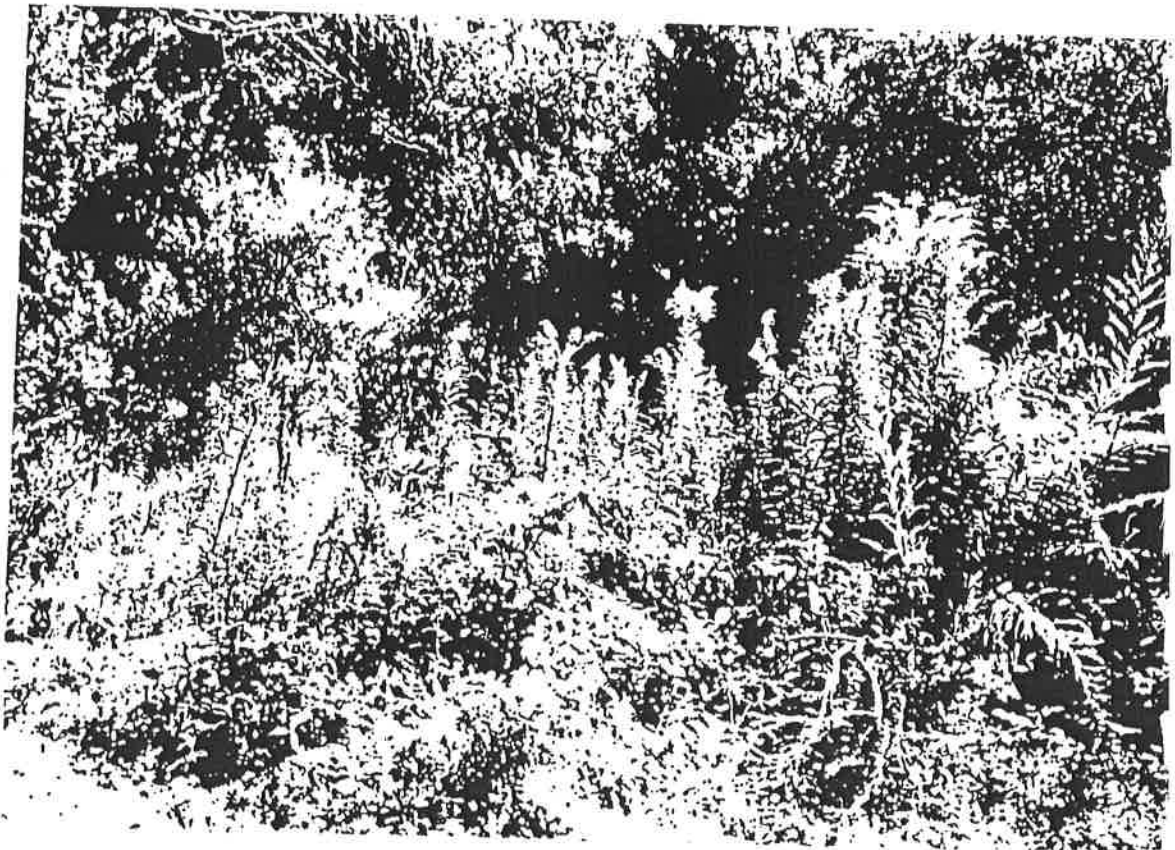
VIEW OF OUTER ISLAND DOCK

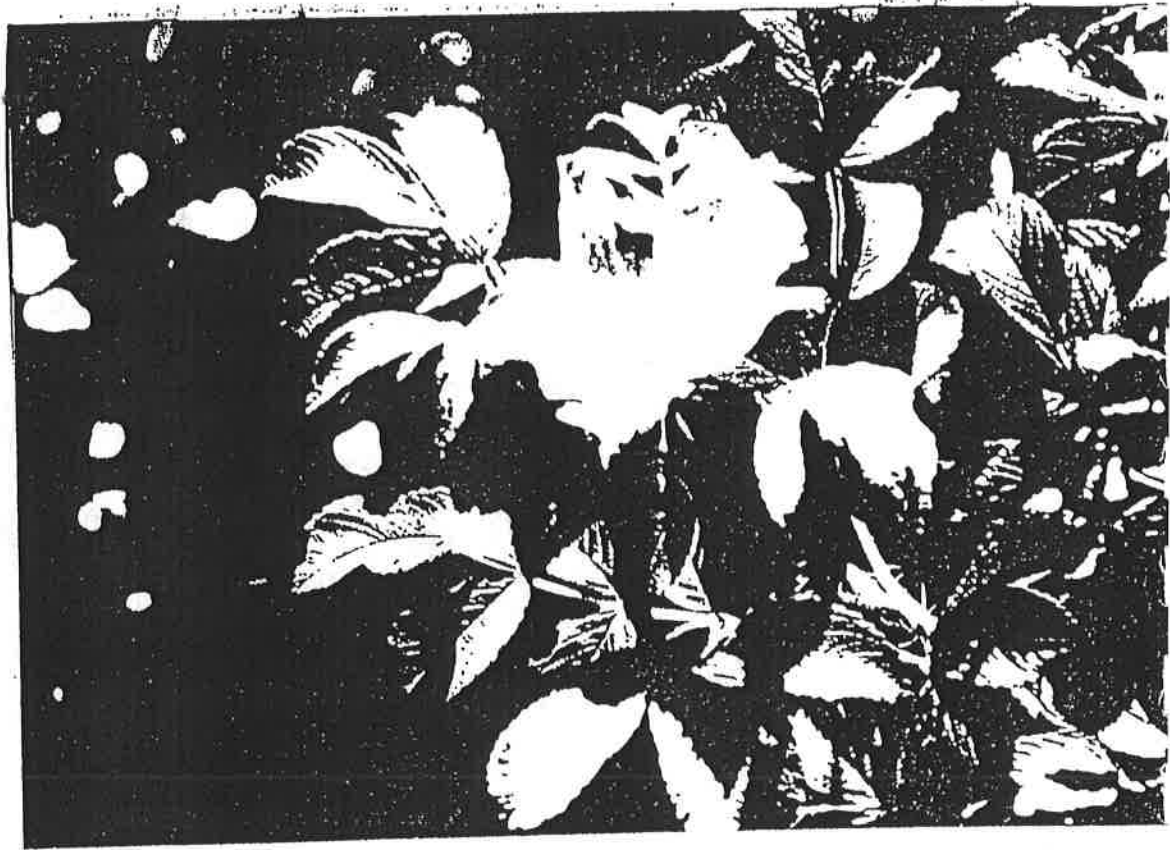
photo 16

BELOW:

Solidago

photo 17





Rosa rugosa

photo 20

BELOW:

Rhus typhina

photo 21

