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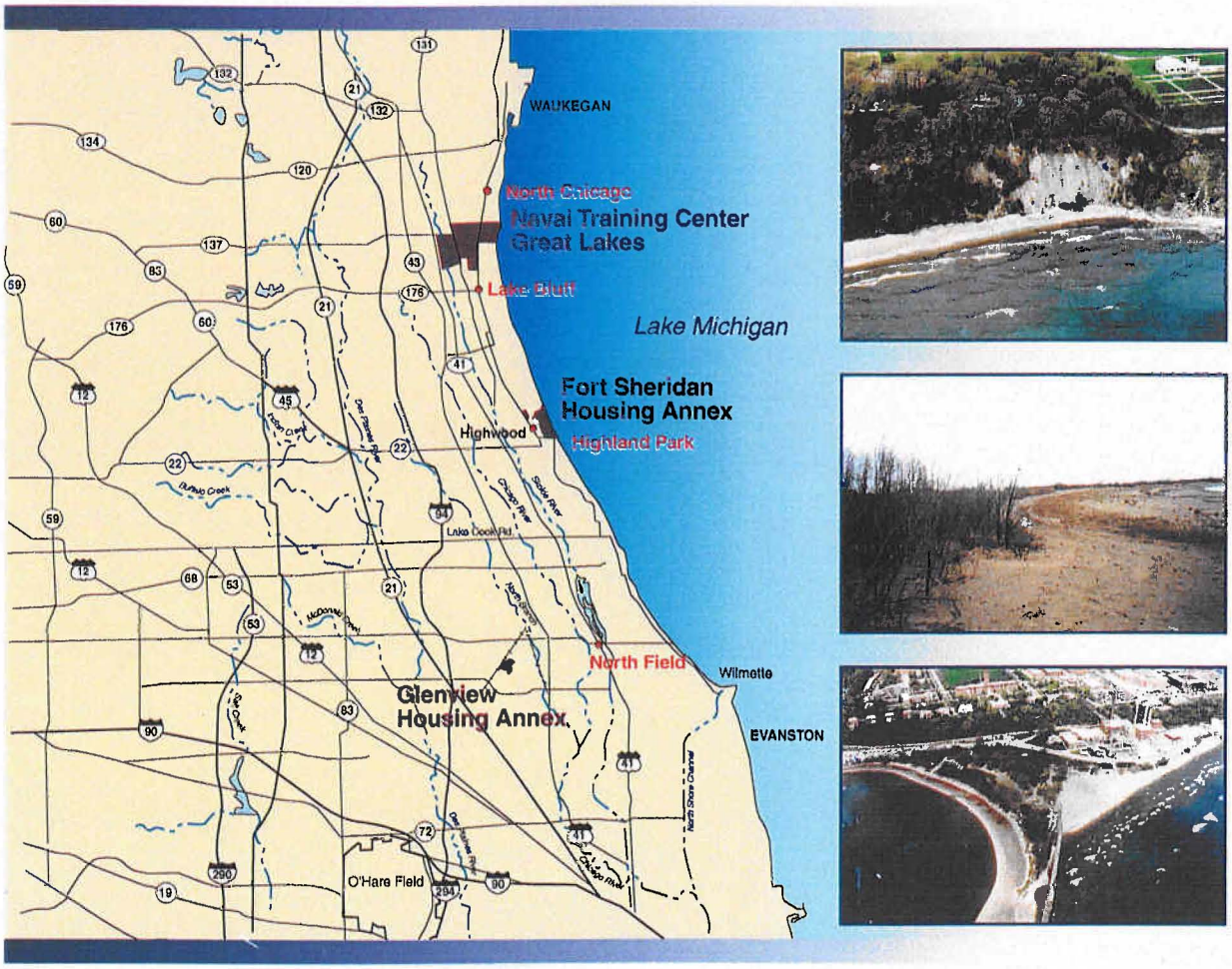
ENVIRONMENTAL ASSESSMENT

IMPLEMENTATION OF AN INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN AT NAVAL TRAINING CENTER GREAT LAKES, ILLINOIS

DEPARTMENT OF THE NAVY



ENVIRONMENTAL ASSESSMENT

IMPLEMENTATION OF AN INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN AT NAVAL TRAINING CENTER GREAT LAKES, ILLINOIS

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORTH CHARLESTON, SOUTH CAROLINA

FEBRUARY 2001

ENVIRONMENTAL ASSESSMENT

Responsible Agency:

Department of the Navy
Southern Division
Naval Facilities Engineering Command
North Charleston, South Carolina

Title:

Environmental Assessment for Implementation of an Integrated Natural Resources Management Plan (INRMP) at Naval Training Center (NTC) Great Lakes, Illinois

Additional Information:

The following individual may be contacted for additional information concerning this document:

Ms. Olivia Westbrook
Department of the Navy
Southern Division
Naval Facilities Engineering Command
P.O. Box 190010
North Charleston, SC 29419-9010
Telephone: (843) 820-5841
E-mail: *westbrookoj@efdsouth.navfac.navy.mil*

Type of Report:

Environmental Assessment (EA)

Abstract:

As part of the Department of Defense (DoD) Authorization Act for Fiscal Year 1998, the Congress of the United States passed the Sikes Act Improvement Act of 1997 (SAIA) on November 18, 1997. The intent of SAIA is to promote effective planning, development, maintenance, and coordination of wildlife, fish, and game conservation and rehabilitation in military installations. *Section 2904* of the SAIA requires the Secretary of each military department to prepare and implement an INRMP for each military installation in the United States under the jurisdiction of the Secretary, unless the Secretary determines that the absence of significant natural resources on a particular installation makes preparation of such a plan inappropriate. An INRMP is a planning document that charts the use and conservation of natural resources on lands and waters under DoD control. NTC Great Lakes has sufficient natural resources to require preparation of an INRMP. The focus of this EA is the proposed development and implementation of an INRMP for NTC Great Lakes.

SUMMARY

1. TYPE OF REPORT

This report is an environmental assessment (EA).

2. NAME OF ACTION

Implementation of an Integrated Natural Resources Management Plan (INRMP) at Naval Training Center (NTC) Great Lakes, Illinois

3. DESCRIPTION OF PROPOSED ACTION

The proposed action is to modify the existing Natural Resources Management Plan and practices at NTC Great Lakes to develop and implement an INRMP, consistent with the military use of the property and the goals and objectives established in the Sikes Act Improvement Act of 1997 (SAIA). The goal of the INRMP is to implement an ecosystem-based conservation program that:

- provides for conservation and rehabilitation of natural resources in a manner consistent with the military mission,
- integrates and coordinates all natural resources management activities,
- provides for sustainable multipurpose uses of natural resources, and
- provides for public access of natural resources in a manner subject to safety and military security considerations.

The objectives are to integrate forestry management, fish and wildlife management, land management, and management for outdoor recreational opportunities, as practicable and consistent with the military mission and established land uses.

4. PURPOSE OF AND NEED FOR THE ACTION

The purpose of the proposed action is to provide for effective stewardship and management of the land and water resources and to promote outdoor recreation and education. The need for the proposed action is to ensure that the Installation's lands remain available and in good condition to support the Installation's military mission. The proposed action will meet the requirements of SAIA, while meeting the needs of the military mission of NTC Great Lakes. Department of the Navy installations are required by SAIA to develop and maintain an integrated program to manage natural resources under their administration. The requirements include multiple use, protection, and enhancement of natural resources; sustainable yield; and maintenance of biological integrity.

5. ALTERNATIVES

The moderate size, existing land uses, limited amount of undisturbed natural resources, and limitations set by the types of habitats found on NTC Great Lakes restrict the integration of the four areas of natural resources management to two levels of intensity, low-intensity and

moderate-intensity. The first level of intensity (Alternative 1 – Low-Intensity) involves meeting all the mandatory requirements for compliance with laws, regulations, permits, executive orders, and Department of Defense policy. No stewardship initiatives are considered at this level. The second level of intensity (Alternative 2 – Moderate-Intensity), the proposed plan presented in the INRMP for implementation, includes all the mandatory requirements of Alternative 1, plus incorporates those stewardship initiatives that are considered reasonable and achievable for a given installation. The implementation of a more proactive high-intensity initiative was not considered viable because of potential impacts to the military mission of the installation. The remaining alternative considered, the No Action Alternative, is continued implementation of the objectives and practices outlined in the existing station Natural Resources Management Plan. The existing Natural Resources Management Plan does not meet the requirements of SAIA; therefore, the No Action Alternative was eliminated from further consideration consistent with Department of the Navy guidance on preparing National Environmental Policy Act documents for INRMPs.

6. UNAVOIDABLE ADVERSE IMPACTS

Any clearing, grubbing, and filling of land that is needed for the implementation of the proposed INRMP would result in some soil erosion in the project area(s). The majority of soil erosion would take place during possible construction activities. Dust and vehicle emissions from possible construction activities would produce temporary impacts on air quality in the immediate region. Both (dust and vehicle emissions) are expected to disperse rapidly with lakefront winds. Any construction activities would occur during normal daily operating hours to reduce the effect of possible construction noise. Possible construction and clearing activities, although anticipated to be minor, could remove some native vegetation. Socioeconomic impacts would be minor, if any, and would affect NTC Great Lakes primarily.

7. MEANS TO MITIGATE ADVERSE ENVIRONMENTAL IMPACTS

The construction contractor(s) should implement soil erosion control measures, such as the use of hay bales and silt fences, to minimize soil erosion during any possible construction activities as part of implementation of the proposed INRMP. The construction contractor(s) should also implement a spill contingency plan, prior to any construction activity, to reduce or eliminate the potential for contamination of soils from accidental spills and releases. Fugitive dust from construction activities could be prevented from becoming airborne through adherence to local ordinances and implementation of dust control measures, such as application of water to dirt paths, gravel roads, materials, stockpiles, and other surfaces.

TABLE OF CONTENTS

SECTION		PAGE
1.0	**PURPOSE OF AND NEED FOR ACTION**	
1.1	INTRODUCTION	1-1
1.2	THE PROPOSED ACTION	1-2
1.3	PURPOSE OF AND NEED FOR PROPOSED ACTION	1-2
1.4	INRMP COORDINATION	1-3
1.4.1	Agency Coordination	1-3
1.4.2	Public Coordination	1-3
2.0	**ALTERNATIVES**	
2.1	ALTERNATIVE 1 (Low-Intensity)	2-2
2.2	ALTERNATIVE 2 (Moderate-Intensity)	2-3
2.3	NO ACTION ALTERNATIVE	2-3
3.0	**AFFECTED ENVIRONMENT**	
3.1	PHYSICAL ENVIRONMENT	3-1
3.1.1	Earth Resources	3-1
3.1.2	Air Resources	3-3
3.1.3	Sound Environment	3-4
3.1.4	Water Resources	3-4
3.2	BIOLOGICAL ENVIRONMENT	3-7
3.2.1	Vegetation	3-7
3.2.2	Wildlife	3-8
3.2.3	Threatened and Endangered Species	3-10
3.2.4	Wetlands	3-13
3.3	SOCIOECONOMIC ENVIRONMENT	3-13
3.3.1	Community Setting and Land Use	3-13
3.3.2	Population and Demographics	3-15
3.3.3	Economic Activity	3-15
3.3.4	Environmental Justice	3-15
3.3.5	Housing	3-16
3.3.6	Education	3-16
3.3.7	Police and Fire Protection	3-17
3.3.8	Utilities	3-17
3.3.9	Recreation	3-18
3.3.10	Cultural Resources	3-18

TABLE OF CONTENTS, *Cont.*

4.0 ENVIRONMENTAL CONSEQUENCES

4.1	PHYSICAL ENVIRONMENT	4-1
4.1.1	Earth Resources	4-1
4.1.2	Air Resources	4-2
4.1.3	Sound Environment	4-3
4.1.4	Water Resources	4-4
4.2	BIOLOGICAL ENVIRONMENT	4-4
4.2.1	Vegetation	4-4
4.2.2	Wildlife	4-4
4.2.3	Threatened and Endangered Species	4-5
4.2.4	Wetlands	4-5
4.3	SOCIOECONOMIC ENVIRONMENT	4-5
4.3.1	Community Setting and Land Use	4-5
4.3.2	Demographics	4-5
4.3.3	Economic Activity	4-5
4.3.4	Environmental Justice	4-5
4.3.5	Housing	4-6
4.3.6	Education	4-6
4.3.7	Police and Fire Protection	4-6
4.3.8	Utilities	4-6
4.3.9	Recreation	4-6
4.3.10	Cultural Resources	4-6
4.4	CUMULATIVE IMPACTS	4-7
4.5	COMPLIANCE WITH VARIOUS LAND USE POLICIES AND CONTROLS	4-8
4.5.1	National Environmental Policy Act	4-8
4.5.2	Clean Water Act	4-8
4.5.3	Rivers and Harbors Act of 1899	4-8
4.5.4	Clean Air Act	4-8
4.5.5	Sikes Act Improvement Act of 1997	4-9
4.5.6	Fish and Wildlife Coordination Act	4-9
4.5.7	Endangered Species Act	4-9
4.5.8	National Historic Preservation Act	4-9
4.5.9	Coastal Zone Management	4-10
4.5.10	Local Land Use Plans	4-10
4.5.11	Floodplain Management	4-10
4.5.12	Wetlands	4-10
4.5.13	Prime and Unique Farmland Soils	4-10
4.5.14	Administration of Environmental Policy (Environmental Justice)	4-10
4.6	ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL	4-11

TABLE OF CONTENTS, *Cont.*

4.7	IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES	4-11
4.8	RELATIONSHIP BETWEEN LOCAL SHORT-TERM USE OF MAN'S ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY	4-11
4.9	ADVERSE ENVIRONMENTAL IMPACTS WHICH CANNOT BE AVOIDED SHOULD THE PROPOSED ACTION BE IMPLEMENTED	4-11
4.10	MEANS TO MITIGATE ADVERSE ENVIRONMENTAL IMPACTS	4-12

5.0 LIST OF PREPARERS

6.0 COORDINATION

7.0 BIBLIOGRAPHY

TABLES

Table 2-1	Mandatory Land Management Projects
Table 2-2	Mandatory Fish and Wildlife Management Projects
Table 2-3	Stewardship Land Management Projects
Table 2-4	Stewardship Fish and Wildlife Management Projects
Table 2-5	Stewardship Projects for Outdoor Recreational Opportunities
Table 3-1	Areas Experiencing Extreme Erosion or Slope Failure on Main Installation Identified During a Survey Conducted in 1998
Table 3-2	National Ambient Air Quality Standards
Table 3-3	Fishes Documented From Lake Michigan in and near NTC Great Lakes Harbors During Surveys Conducted in 1983, 1984, and 1986
Table 3-4	Breeding and Migratory Birds Documented on the Main Installation and Fort Sheridan Housing Annex
Table 3-5	List of Mammals That Are or May Be Found on the Main Installation, Fort Sheridan Housing Annex, and Glenview Housing Annex
Table 3-6	State-Listed Threatened or Endangered Plants Documented to Occur on the Main Installation and Fort Sheridan Housing Annex
Table 3-7	State-Listed Threatened or Endangered Animal Species Documented to Occur on the Main Installation and Fort Sheridan Housing Annex
Table 3-8	Population and Demographics
Table 3-9	Contributing Properties of Major Historic Significance within NTC Great Lakes Historic District

TABLE OF CONTENTS, *Cont.*

FIGURES

Figure 1-1	Location Map
Figure 1-2	Main Installation – Site Map
Figure 1-3	Glenview Housing Annex – Site Map
Figure 1-4	Fort Sheridan Housing Annex – Site Map
Figure 2-1	Alternative 1 – Low Intensity (Main Installation)
Figure 2-2	Alternative 1 – Low Intensity (FSHA)
Figure 2-3	Alternative 1 – Low Intensity (GHA)
Figure 2-4	Alternative 2 – Moderate Intensity (Main Installation)
Figure 2-5	Alternative 2 – Moderate Intensity (FSHA)
Figure 2-6	Alternative 2 – Moderate Intensity (GHA)
Figure 2-7	Existing Natural Resource Management Plan (Main Installation)
Figure 2-8	Existing Natural Resource Management Plan (FSHA)
Figure 2-9	Existing Natural Resource Management Plan (GHA)
Figure 3-1	Main Installation – Elevation Map
Figure 3-2	Fort Sheridan Housing Annex – Elevation Map
Figure 3-3	Glenview Housing Annex – Elevation Map
Figure 3-4	Main Installation – Soils Map
Figure 3-5	Fort Sheridan Housing Annex – Soils Map
Figure 3-6	Erosion Occurring within Pettibone Ravine
Figure 3-7	Slope Failure Occurring in and on Top of Pettibone Ravine
Figure 3-8	Slope Failure and Erosion Locations on Main Installation
Figure 3-9	Infrastructure in Pettibone Ravine affected by Erosion and Slope Failure
Figure 3-10	Bluff and Beach Losses Occurring at the Main Installation
Figure 3-11	Bluff Losses Occurring at Fort Sheridan Housing Annex
Figure 3-12	Glenview Housing Annex – Soils Map
Figure 3-13	Historic District Boundary and Contributing Properties of Major Significance – NTC Great Lakes
Figure 3-14	Archeological Sites at the Main Installation

ABBREVIATIONS AND ACRONYMS

AQCR	Air Quality Control Region
BEQ	Bachelor Enlisted Quarters
BFI	Browning Ferris Industries
BOQ	Bachelor Officers Quarters
BTUs	British Thermal Units
CAA	Clean Air Act
CEQ	Council on Environmental Quality
cm	centimeter(s)
CZM	Coastal Zone Management
dB	decibel
DDT	dichloro-diphenyl-trichloroethane
DoD	Department of Defense
DoDI	Department of Defense Instruction
EA	Environmental Assessment
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FSHA	Fort Sheridan Housing Annex
FY	Fiscal Year
GHA	Glenview Housing Annex
GLPD	Great Lakes Police Department
ha	hectare(s)
HABS	Historic American Buildings Survey
lb/hr	pounds/hour
ICBO	International Council of Building Officials
IDNR	Illinois Department of Natural Resources
IEPA	Illinois Environmental Protection Agency
IESPB	Illinois Endangered Species Protection Board
INRMP	Integrated Natural Resources Management Plan
kg	kilogram(s)
kg/hr	kilograms per hour
km	kilometer(s)
m	meter(s)
MABAS	Mutual Aid Box Alarm System
mg	milligrams
MOA	Memorandum of Agreement
MSCDC	Missouri State Census Data Center
MWH	megawatt-hours
NAAQS	National Ambient Air Quality Standards
NDS	National Decisions Systems
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPS	non-point source
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places

NRMP	Natural Resources Management Plan
NTC	Naval Training Center
OPNAVINST	Chief of Naval Operations Instruction
PA	Programmatic Agreement
PCB	polychlorinated biphenyl
ppb	parts per billion
ppm	parts per million
PPP	Pollution Prevention Plan
psi	pounds per square inch
PWC	Public Works Center
RTC	Recruit Training Command
SAIA	Sikes Act Improvement Act of 1997
SCS	Soil Conservation Service
SHPO	State Historic Preservation Officer
SVOC	semi volatile organic compounds
TPY	tons per year
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VA	Department of Veteran's Affairs
$\mu g/m^3$	micrograms per cubic meter

1.0 PURPOSE OF AND NEED FOR ACTION

1.1 INTRODUCTION

Naval Training Center (NTC) Great Lakes includes 1,939 acres (785 hectares [ha]) consisting of three separate parcels, the Main Installation containing 1,648 acres (667 ha); the Glenview Housing Annex (GHA), containing 85 acres (34 ha); and the Fort Sheridan Housing Annex (FSHA), containing 206 acres (83 ha). The Main Installation is located in Lake County, Illinois, in the northeastern portion of the state within the municipality of North Chicago (*Figures 1-1* and *1-2*). The Main Installation is approximately 35 miles (56 kilometers [km]) north of the central business district of Chicago, and 65 miles (105 km) south of Milwaukee, Wisconsin. The Main Installation is bordered by Lake Michigan to the east, industrial areas of North Chicago to the north, residential areas of Lake Bluff to the south, and unincorporated Shields Township to the west. GHA is located 18 miles (29 km) south-southwest of the Main Installation off of U.S. Highway 41 in Cook County (*Figures 1-1* and *1-3*). FSHA is located 10 miles (16 km) south of the Main Installation, within the city limits of Highland Park, off Sheridan Road (*Figures 1-1* and *1-4*).

NTC Great Lakes is the Navy's largest training center whose mission is to provide the fleet with well-trained, well-schooled sailors. To meet this mission, NTC Great Lakes is home to three major commands with training responsibilities: Recruit Training Command (RTC), Service School Command, and Hospital Corps School (U.S. Navy, 1998a).

As part of the Department of Defense (DoD) Authorization Act for Fiscal Year (FY) 1998, the Congress of the United States passed the Sikes Act Improvement Act of 1997 (SAIA) on November 18, 1997. The intent of SAIA is to promote effective planning, development, maintenance, and coordination of wildlife, fish, and game conservation and rehabilitation in military installations. *Section 2904* of SAIA requires the Secretary of each military department to prepare and implement an Integrated Natural Resources Management Plan (INRMP) for each military installation in the United States under the jurisdiction of the Secretary, unless the Secretary determines that the absence of significant natural resources on a particular installation makes preparation of such a plan inappropriate. An INRMP is a planning document that charts the use and conservation of natural resources on lands and waters under DoD control. NTC Great Lakes has sufficient natural resources to require preparation of an INRMP.

The Sikes Act Improvement Act requires, to the extent appropriate and applicable, that INRMPs provide the following.

1. Fish and wildlife management, land management, forest management, and fish and wildlife-oriented recreation
2. Fish and wildlife habitat enhancement or modifications
3. Wetlands protection, enhancement, and restoration, where necessary for support of fish, wildlife, or plants
4. Integration of and consistency among the various activities conducted under the plan
5. Establishment of specific natural resources management goals and objectives and time frames for proposed actions
6. Sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of the fish and wildlife resources

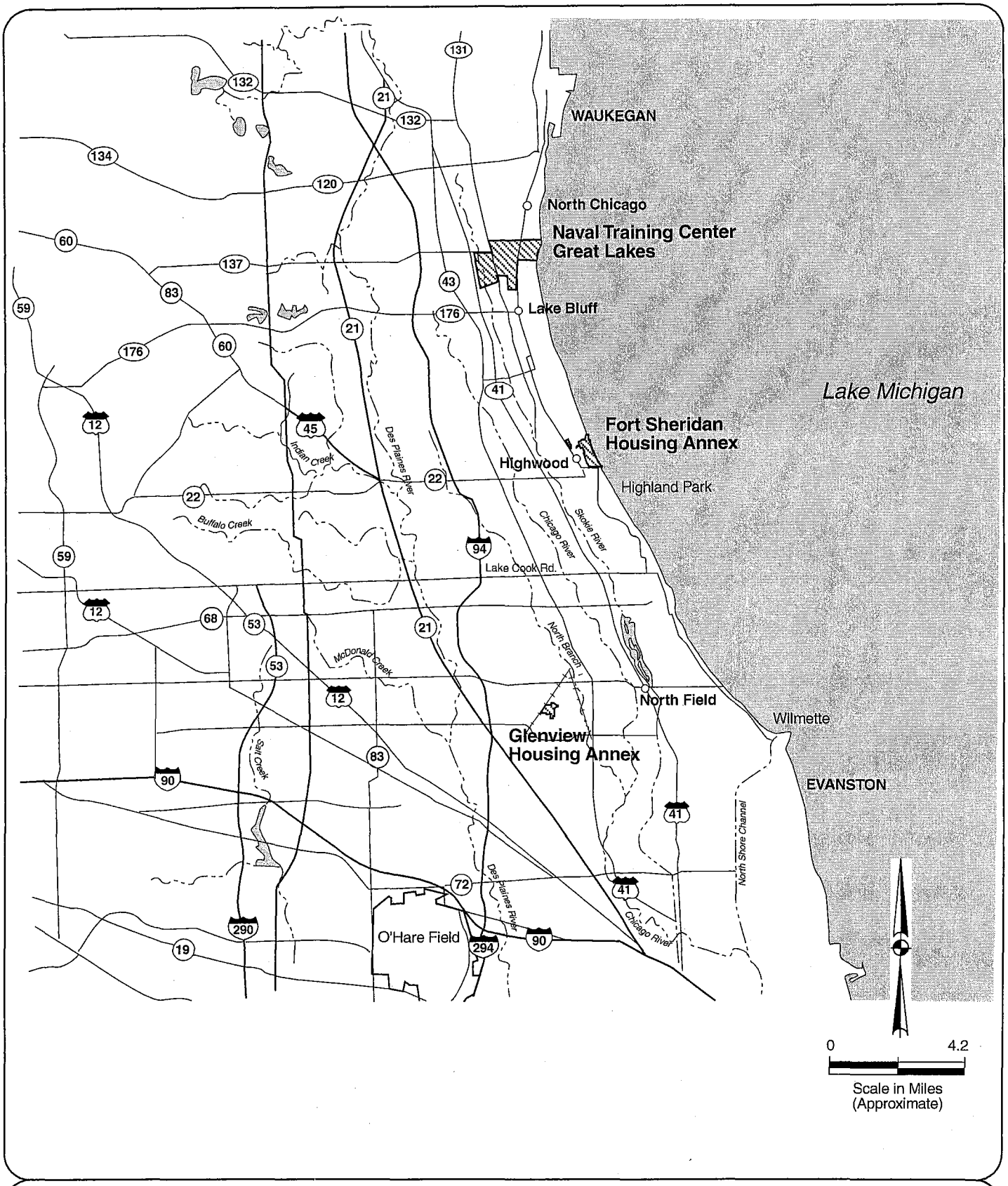


Figure 1-1. Location Map

Note: To convert miles to kilometers, multiply by 1.60935.

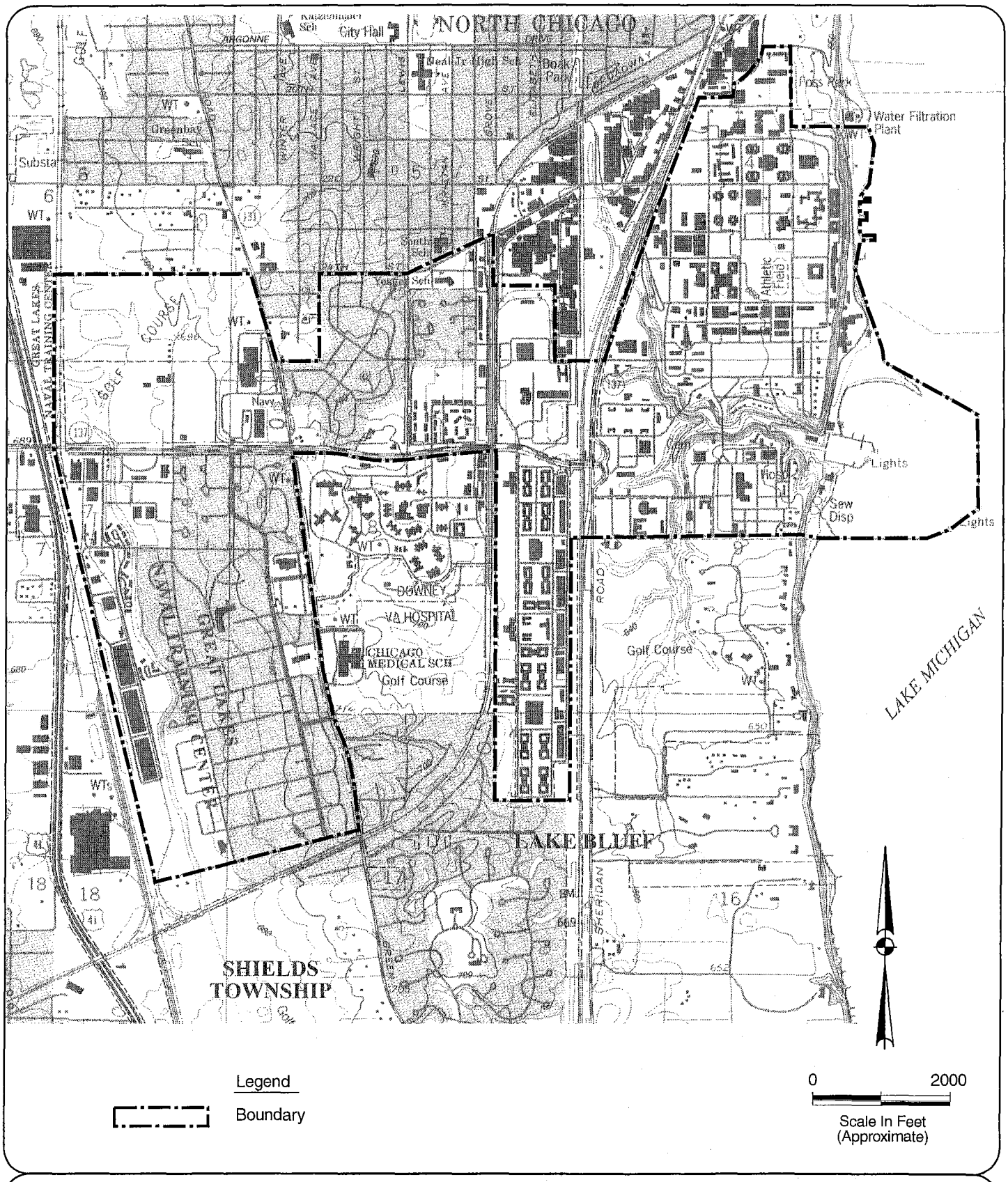


Figure 1-2. Main Installation - Site Map

Note: To convert feet to meters, multiply by 0.3048.

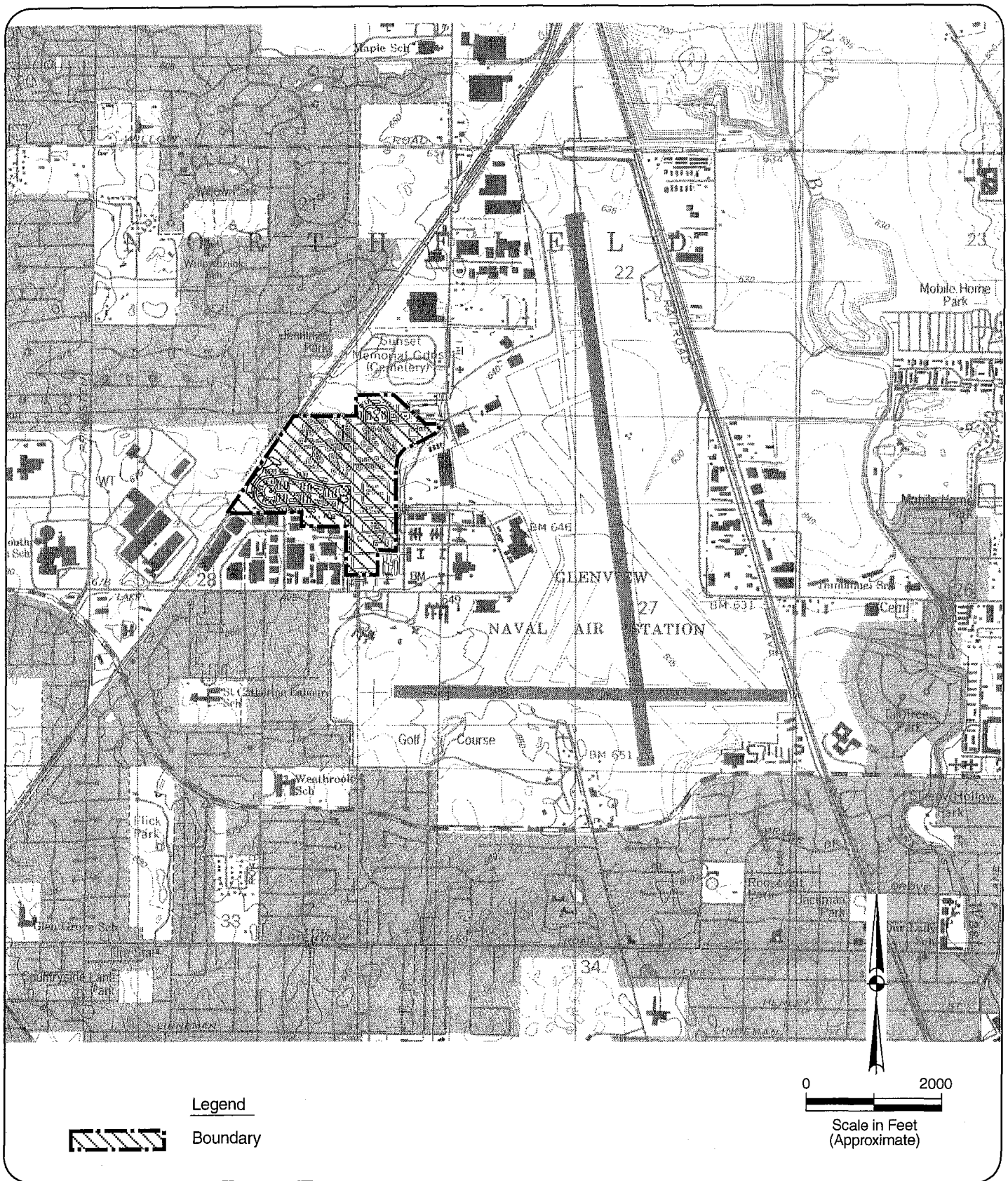


Figure 1-3. Glenview Housing Annex - Site Map

Note: Multiply by 0.3048 to convert feet to meters.

Legend

Boundary

Figure 1-4. Fort Sheridan Housing Annex - Site Map

Note: Multiply by 0.3048 to convert feet to meters.

7. Public access to the military installation that is necessary and appropriate for use described in item six, subject to requirements necessary to ensure safety and military security
8. Enforcement of applicable natural resources laws and regulations
9. No net loss in the capability of military installation lands to support the military mission of the installation
10. Such other activities as the Secretary of each military department determines appropriate

The focus of this Environmental Assessment (EA) is the proposed development and implementation of an INRMP for NTC Great Lakes. This document is intended to provide the decision-maker with information needed to understand the future environmental consequences that could result from the implementation of the INRMP at NTC Great Lakes, with the impact analysis focusing on the evaluation and comparison of alternative plans in terms of the management objectives of integrating forestry management, fish and wildlife management, land management, and management for outdoor recreational opportunities, not the individual projects or practices. The content of the impact analysis is, therefore, "programmatic" in that it evaluates alternative programs for managing an installation's natural resources. The EA was prepared in accordance with the Council on Environmental Quality's (CEQ) National Environmental Policy Act (NEPA) regulations, as implemented by the Department of the Navy's Environmental and Natural Resources Program Manual (OPNAVINST 5090.1B, Change 2), and Guidance on Preparing NEPA Documents for INRMPs (U.S. Navy, 1998b).

1.2 THE PROPOSED ACTION

The proposed action is to modify the existing Natural Resources Management Plan and practices at NTC Great Lakes to develop and implement an INRMP, consistent with the military use of the property and the goals and objectives established in SAIA. The goal of the INRMP is to implement an ecosystem-based conservation program that:

- provides for conservation and rehabilitation of natural resources in a manner consistent with the military mission,
- integrates and coordinates all natural resources management activities,
- provides for sustainable multipurpose uses of natural resources, and
- provides for public access of natural resources in a manner subject to safety and military security considerations.

The objectives are to integrate forestry management, fish and wildlife management, land management, and management for outdoor recreational opportunities, as practicable and consistent with the military mission and established land uses. The proposed action is discussed in more detail in *Section 2.0*.

1.3 PURPOSE OF AND NEED FOR PROPOSED ACTION

The purpose of the proposed action is to provide for effective stewardship and management of the land and water resources and to promote outdoor recreation and education. The need for the proposed action is to ensure that the Installation's lands remain available and in good condition to support the Installation's military mission. The proposed action will meet the requirements of SAIA, while meeting the needs of the military mission of NTC Great Lakes. Department of the Navy installations are required by SAIA (16 USC 670a through o), as implemented by DoD Instruction (DoDI) 4715.3 and the Environmental and Natural Resources Program Manual (OPNAVINST 5090.1B, Change 2), to develop

and maintain an integrated program to manage natural resources under their administration. The requirements include multiple use, protection, and enhancement of natural resources; sustainable yield; and maintenance of biological integrity.

1.4 INRMP COORDINATION

1.4.1 Agency Coordination

Section 2904 of SAIA states that the INRMP shall reflect the mutual agreement of the U.S. Fish and Wildlife Service (USFWS) and the state fish and wildlife agency—in this case, the Illinois Department of Natural Resources (IDNR)—concerning conservation, protection, and management of fish and wildlife resources. Mutual agreement is the goal with respect to the entire plan; however, SAIA is not intended to expand the management authority of the USFWS or IDNR in relation to military lands. *Section 2904* of SAIA states that nothing in this law enlarges or diminishes the responsibility and authority of any state for the protection and management of fish and resident wildlife. Mutual agreement is required only with respect to those elements of the plan subject to the otherwise applicable legal authority (i.e., authority derived from a source other than SAIA, such as the Endangered Species Act) of the USFWS and IDNR to conserve, protect, and manage fish and wildlife resources. Consistent with the requirements of SAIA, the draft INRMP was provided to the USFWS and IDNR for review and comment, and to obtain the mutual agreement of their agency.

1.4.2 Public Coordination

The proposed INRMP for NTC Great Lakes has been placed at the Waukegen Public Library for public review and notice of its availability has been advertised in the local newspaper to provide an opportunity for public comments concerning the proposed INRMP, as required by *Section 2905(d)(1)* of SAIA.

2.0 ALTERNATIVES

Traditionally, the implementation of the four areas of natural resources management (forestry management, fish and wildlife management, land management, and management for outdoor recreational opportunities) have been addressed separately within each Naval installation's existing Natural Resources Management Plan (NRMP). Each of the individual management issues were independently developed, resulting in segmented management of the installation's natural resources. As a result, natural resource goals and objectives are in conflict.

As discussed in *Section 1.2*, the goal of the INRMP is to implement a program that:

- provides for conservation and rehabilitation of natural resources in a manner consistent with the military mission,
- integrates and coordinates all natural resources management activities,
- provides for sustainable multipurpose uses of natural resources, and
- provides for public access of natural resources in a manner subject to safety and military security considerations.

The objectives of the INRMP established in SAIA are to integrate forestry management, fish and wildlife management, land management, and management for outdoor recreational opportunities, as practicable and consistent with the military mission and established land uses.

In order to meet the goals and objectives of the INRMP, the alternatives considered consist of the integration of the four areas of natural management at various levels of intensity, with all of the intensity-level alternatives being in compliance with SAIA. The levels of intensity would generally vary from implementation of only those projects that are considered to be mandatory to meet natural resources management goals and objectives (low-intensity) to a maximum level of intensity, based on the maximum available natural resource opportunities at the installation (high-intensity). The most reasonable level of intensity, or preferred level, for an installation is the level that best meets the available natural resources opportunities of the installation and has the most reasonable chance of obtaining funding.

The first level of intensity (Alternative 1 – Low-Intensity) would involve meeting all the mandatory requirements for compliance with laws, regulations, permits, executive orders, and DoD policy. No stewardship initiatives would be considered at this level. The second level of intensity (Alternative 2 – Moderate-Intensity) would include all the mandatory requirements of Alternative 1, plus would incorporate those stewardship initiatives that are considered reasonable and achievable for a given installation. The costs to implement these stewardship initiatives would be considered moderate and would have a reasonable chance of obtaining funding. The third level of intensity (Alternative 3 – High-Intensity) would be the most proactive, it would include the requirements of Alternatives 1 and 2, plus identify aggressive, high-investment stewardship initiatives. This level of intensity would go well beyond those funding levels that have historically been approved to implement natural resources management plans at a given installation. The high-intensity alternative would generally apply to relatively moderate- to large-sized installations with large amounts of existing natural resource areas managed by several full-time Natural Resource Specialists.

NTC Great Lakes consists of 1,939 acres (785 ha) in three separate parcels. The Main Installation consists of 1,648 acres (667 ha) of land, GHA consists of 85 acres (34 ha) of land, and FSHA consists of 206 acres (83 ha) of land. Of the 1,648 acres (667 ha) of land located at the Main Installation and 206 acres (83 ha) of land located at FSHA, approximately 30 percent is identified as unimproved; however, much of this land consists of deep ravines, steep bluffs overlooking Lake Michigan, and lakeshore/beach areas. The land located at GHA consists of mostly housing and adjacent landscaped areas. The moderate size, existing land uses, limited amount of undisturbed natural resources, and limitations set by the types of habitats found at NTC Great Lakes restrict development of the various intensity levels to those identified for Alternatives 1 and 2. The implementation of the more proactive initiatives identified in Alternative 3 would require potential modifications to the existing military mission, and to existing and projected land uses of the installation. For these reasons, Alternative 3 was not considered viable and was eliminated from further consideration.

Although both Alternatives 1 and 2 meet the basic objectives of integrating the areas of natural resources management established in SAIA, Alternative 2 is more proactive in meeting the SAIA requirements for multiple use, protection, and enhancement of natural resources; and maintenance of biological integrity. Alternative 2 is the plan presented in the INRMP for implementation at NTC Great Lakes; however, possible funding constraints for the proposed stewardship projects may prevent full implementation. The plan most likely to be implemented at NTC Great Lakes is Alternative 1 plus those stewardship projects identified under Alternative 2 that are ultimately funded. The following sections describe the alternative plans considered for implementation at NTC Great Lakes, and the No Action Alternative.

2.1 ALTERNATIVE 1 (Low-Intensity)

The actions proposed under Alternative 1 would involve implementation of the minimum natural resources management requirements (those that are mandatory) for compliance with laws, regulations, permits, executive orders, and DoD policy. No stewardship initiatives are considered at this level. The plan would consist of implementation of mostly land management projects, with specific fish and wildlife management projects integrated within or across the more prominent land management projects. No outdoor recreational opportunity projects are included at this level because they are not considered mandatory in applicable laws, regulations, permits, executive orders, and DoD policy. Additionally, NTC Great Lakes does not control any lands suitable, or having the potential, for forestry management.

Figures 2-1, *2-2*, and *2-3* present the proposed Alternative 1 plan for NTC Great Lakes. For the total 1,939 acres (785 ha) located at NTC Great Lakes, the plan would consist of 10 mandatory land management projects, 6 mandatory fish and wildlife management projects, and 3 mandatory projects that are applicable to both of the natural resources management categories. The land management projects considered for the three sites are presented in *Table 2-1*. The fish and wildlife management projects considered are presented in *Table 2-2*.

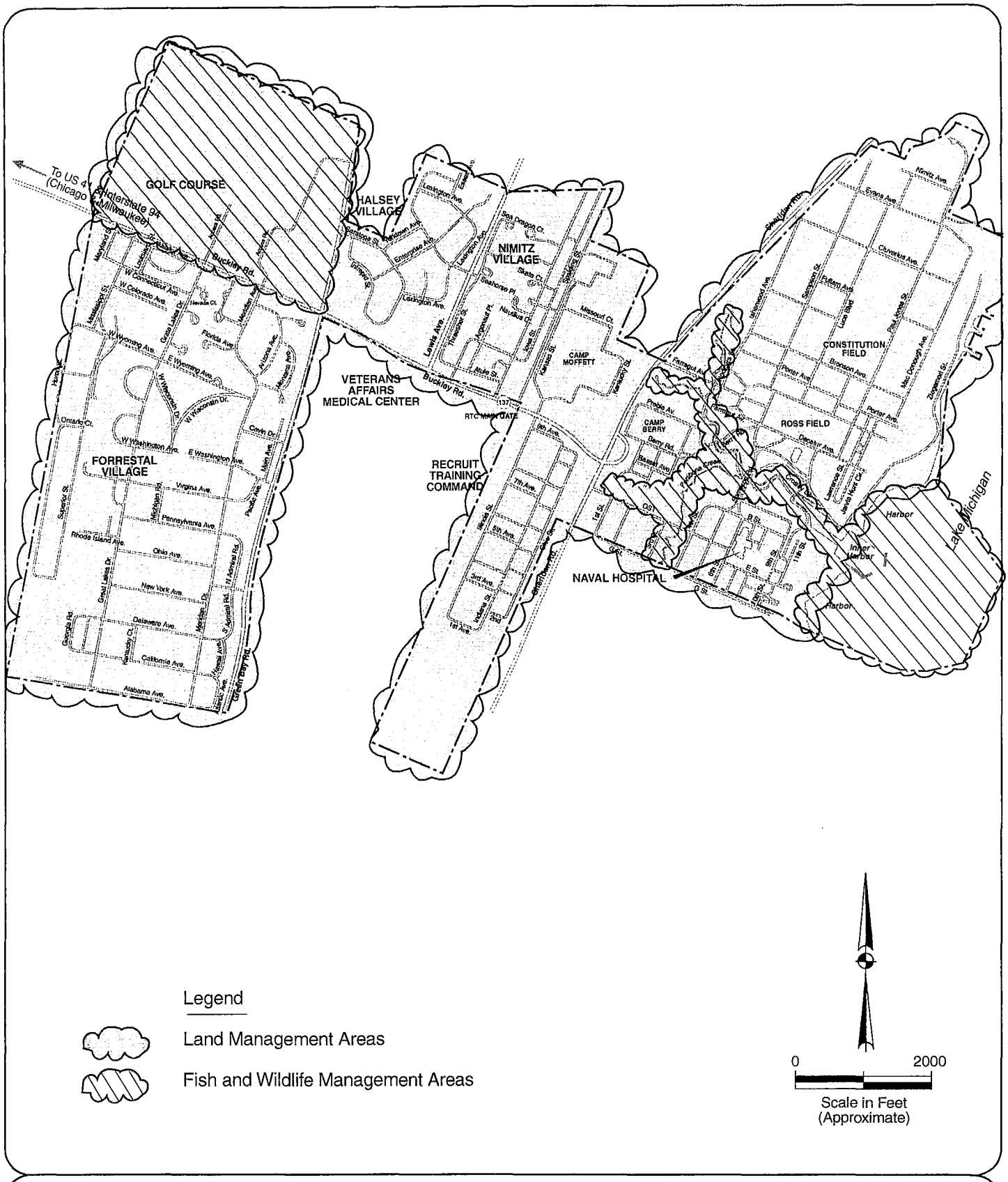


Figure 2-1. Alternative 1- Low Intensity (Main Installation)

Note: Multiply by 0.3048 to convert feet to meters.

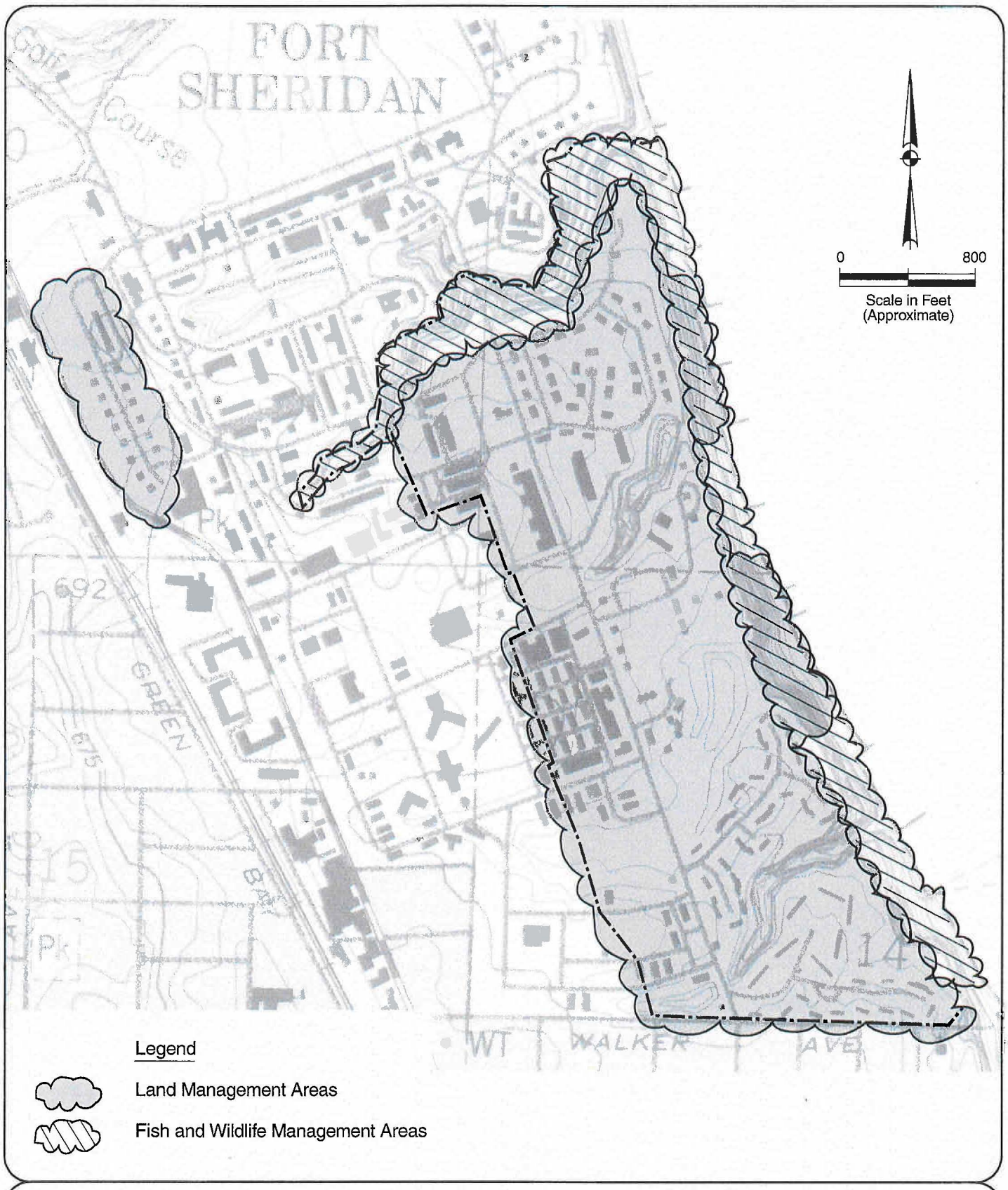


Figure 2-2. Alternative 1- Low Intensity (FSHA)

Note: Multiply by 0.3048 to convert feet to meters.

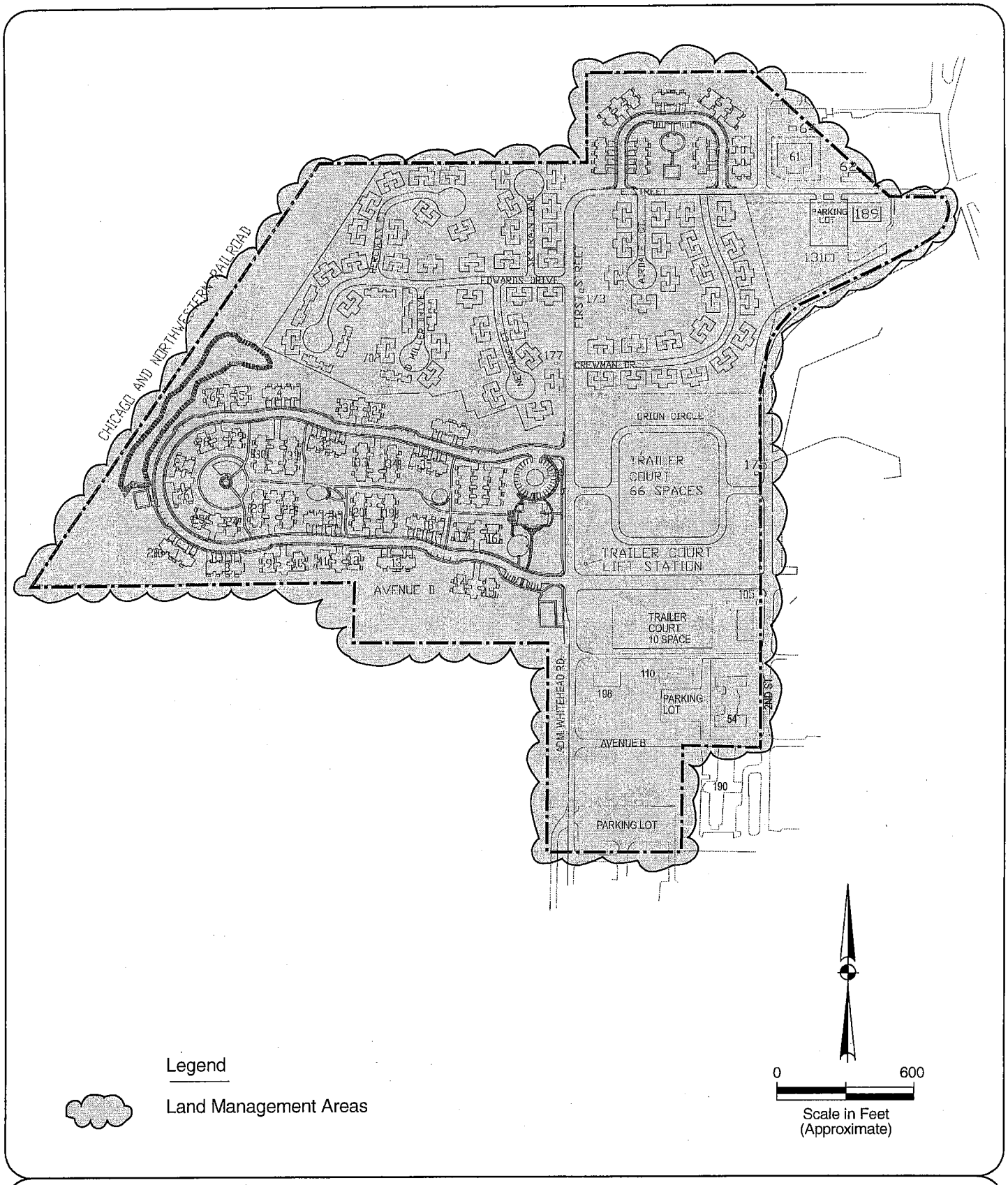


Figure 2-3. Alternative 1 - Low Intensity (GHA)

Note: Multiply by 0.3048 to convert feet to meters.

TABLE 2-1 MANDATORY LAND MANAGEMENT PROJECTS

Action	Priority[1]	Legal Driver
Implement recommended slope stabilization measures from the study conducted in 2000	Mandatory	16 USC 1001, 33 USC 426, and Executive Order 13148
Study, evaluate, determine erosion control and water conservation requirements of south and west tributary ravine slopes of Main Installation	Mandatory	16 USC 1001, 33 USC 426, and Executive Order 13148
Study, evaluate, determine erosion control and water conservation requirements of FSHA ravine slopes	Mandatory	16 USC 1001, 33 USC 426, and Executive Order 13148
Study, evaluate, determine erosion control and water conservation requirements of lakefront slopes, north end of Main Installation	Mandatory	16 USC 1001, 33 USC 426, and Executive Order 13148
Study, evaluate, determine erosion control and water conservation requirements of lakefront slopes, south end of Main Installation	Mandatory	16 USC 1001, 33 USC 426, and Executive Order 13148
Study and evaluate creek bed stabilization methods and impact of non-point source pollution	Mandatory	16 USC 1001, 33 USC 426, and Executive Order 13148
Investigate restoration and implement initial recommendations for the sand dune-beach communities	Mandatory	16 USC 1001, 33 USC 426, and Executive Order 13148
Study and implement noxious weed(s) control program, in areas of native vegetation, project consisting of: identify, map and prioritize areas, initiate control measures, re-introduce replacement native flora, and establish long-term surveillance	Mandatory	7 USC 2801 *et seq.*, 7 USC 2814, 16 USC 670a-f, Executive Order 11987, and Executive Order 13112
Study and implement noxious weed(s) control program in landscaped areas project consisting of: identify, map and prioritize areas, initiate control measures, and establish long-term surveillance	Mandatory	7 USC 2801 *et seq.*, 7 USC 2814, 16 USC 670a-f, Executive Order 11987, and Executive Order 13112
Update the 1999 wetland survey report to ensure wetlands are adequately protected with no loss or degradation	Mandatory	16 USC 2912, 16 USC 4408, 16 USC 670a-f, 33 USC 1251, and Executive Order 11990

TABLE 2-1 ***cont'd***

Action	Priority[1]	Legal Driver
Update and revise the Integrated Natural Resources Management Plan, addressing program accomplishments, regulatory and policy changes[2]	Mandatory	16 USC 670a-f
Natural Resources Manager shall participate in training classes, seminars, conferences, self-study programs, etc. for professional improvement[2]	Mandatory	DOD INST 4715.3
Develop a GIS database mapping system of wildlife habitats, soil and water resources, erosion sites and other impacted conditions[2]	Mandatory	DOD INST 4715.3

[1] Mandatory activities are those required to comply with the listed Federal or state environmental laws, Executive Orders, or Naval Regulations.
[2] This mandatory project is applicable to both land management and fish and wildlife management.

TABLE 2-2 MANDATORY FISH AND WILDLIFE MANAGEMENT PROJECTS

Action	Priority[1]	Legal Driver
Develop monitoring plan and remove/eradicate purple loosestrife, woody and invasive exotic plants from the sand dune-wetland communities	Mandatory	7 USC 2801 *et seq.* and 2814, 16 USC 670a-f, 32 CFR 190 (App. B.1.a) and 190.4(c), Executive Order 11987, and DOD INST 4715.3
Develop and implement monitoring program for protecting FSHA bluffs from excessive rates of erosion, noxious plants and human impact	Mandatory	16 USC 670a-f, 32 CFR 190 (App. B.1.a), and Executive Order 13148
Update the 1995 species survey, document changes, and conduct baseline survey of areas previously omitted	Mandatory	16 USC 1531, 16 USC 1536, and 16 USC 670a-f
Incorporate information (developed from Project No. 24 above) into NRDA program	Mandatory	16 USC 670a-f, 32 CFR 190.4(c), and DOD MNST 4715.3
Remove exotic and invasive trees and woody plants from ravine slopes to improve conditions for wildlife	Mandatory	7 USC 2814 and Executive Order 13112
Establish and begin program of monitoring Asian longhorned beetles, gypsy moths, and other destructive/ invasive species	Mandatory	Executive Order 13112
Update and revise the Integrated Natural Resources Management Plan, addressing program accomplishments, regulatory and policy changes[2]	Mandatory	16 USC 670a-f
Natural Resources Manager shall participate in training classes, seminars, conferences, self-study programs, etc. for professional improvement[2]	Mandatory	DOD INST 4715.3
Develop a GIS database mapping system of wildlife habitats, soil and water resources, erosion sites and other impacted conditions[2]	Mandatory	DOD INST 4715.3

[1]Mandatory activities are those required to comply with the listed Federal or state environmental laws, Executive Orders, or Naval Regulations.
[2] This mandatory project is applicable to both land management and fish and wildlife management.

2.2 ALTERNATIVE 2 (Moderate-Intensity)

Alternative 2, the proposed action identified in the INRMP, would include all the mandatory requirements of Alternative 1, plus those stewardship initiatives that are considered reasonable and achievable for NTC Great Lakes. The costs to implement these stewardship initiatives would be considered moderate and would have a reasonable chance of obtaining funding. The Alternative 2 plan would consist of implementation of land management projects, with specific fish and wildlife management, and outdoor recreational opportunity projects integrated within or across the more prominent land management projects. Additionally, as indicated in *Section 2.1*, NTC Great Lakes does not control any lands suitable, or having the potential, for forestry management. *Figures 2-4*, *2-5*, and *2-6* present the proposed Alternative 2 plan for NTC Great Lakes. The plan consists of the projects identified for the Alternative 1 plan (*Tables 2-1* and *2-2*), plus 9 stewardship land management projects (*Table 2-3*), 16 stewardship fish and wildlife management projects (*Table 2-4*), 3 stewardship outdoor recreational opportunity projects (*Table 2-5*), and 3 stewardship projects that are applicable to all of the natural resources management categories.

2.3 NO ACTION ALTERNATIVE

The No Action Alternative is continued implementation of the objectives and practices outlined in the existing 1995 NRMP. Ongoing practices used for management of the natural resources at NTC Great Lakes would continue, and there would be no change to the objectives outlined under the current NRMP. The current NRMP for NTC Great Lakes covers land management and fish and wildlife management only. NTC Great Lakes was exempted from developing an outdoor recreation section and forestry management section for the 1995 NRMP. *Figures 2-7*, *2-8*, and *2-9* present the existing plan for NTC Great Lakes. A summary of the existing plan follows.

Land Management Section

This section of the 1995 NRMP addresses:

- Reduction of grounds maintenance costs.
- Non-point source pollution control and minimization.
- Grounds maintenance contracts and contractors responsibilities.
- Methods for pruning trees, trimming shrubs, maintaining lawns.
- The importance of controlling erosion with limited recommendations on methods to do so.
- A list of recommended projects to address more serious problems extant at the time the NRMP was written.

The 1995 Land Management Section is concerned mostly with the management of landscaped areas in Other and Improved Land Use areas. It deals little with managing sensitive habitats, isolated wetlands, and threatened and endangered species habitats even though such areas are found on the Main Installation and FSHA and could be addressed under the Land Management Section. Discussion of non-point source (NPS) pollutants is limited to identifying the current regulations regarding prevention of NPS pollution and the DoD NPS pollution management strategy. No discussion of sources that are present on the installation or ways to address specific NPS pollution problems are given within the 1995 Land Management Section. An extensive appendix covering

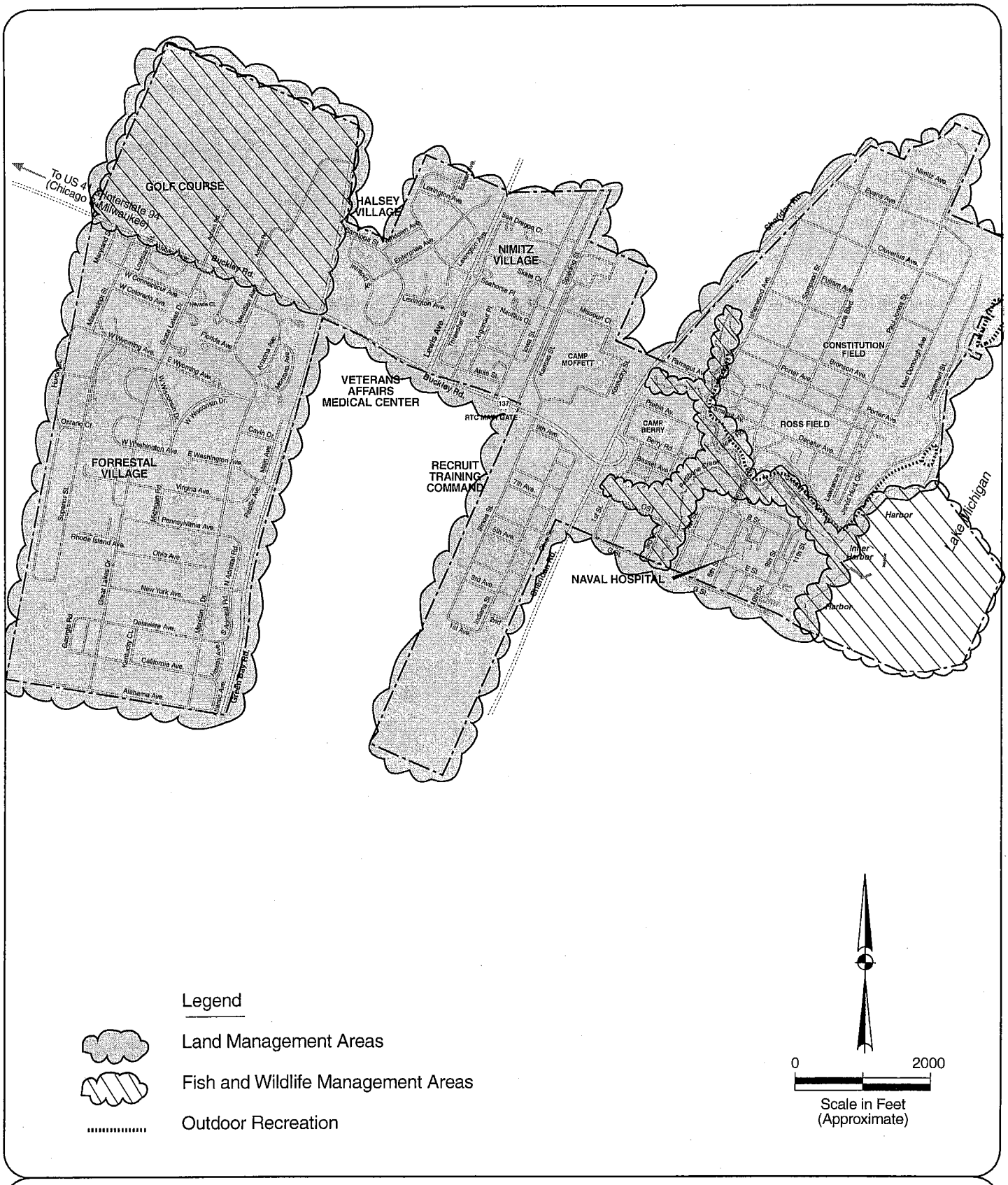


Figure 2-4. Alternative 2 - Moderate Intensity (Main Installation)

Note: Multiply by 0.3048 to convert feet to meters.

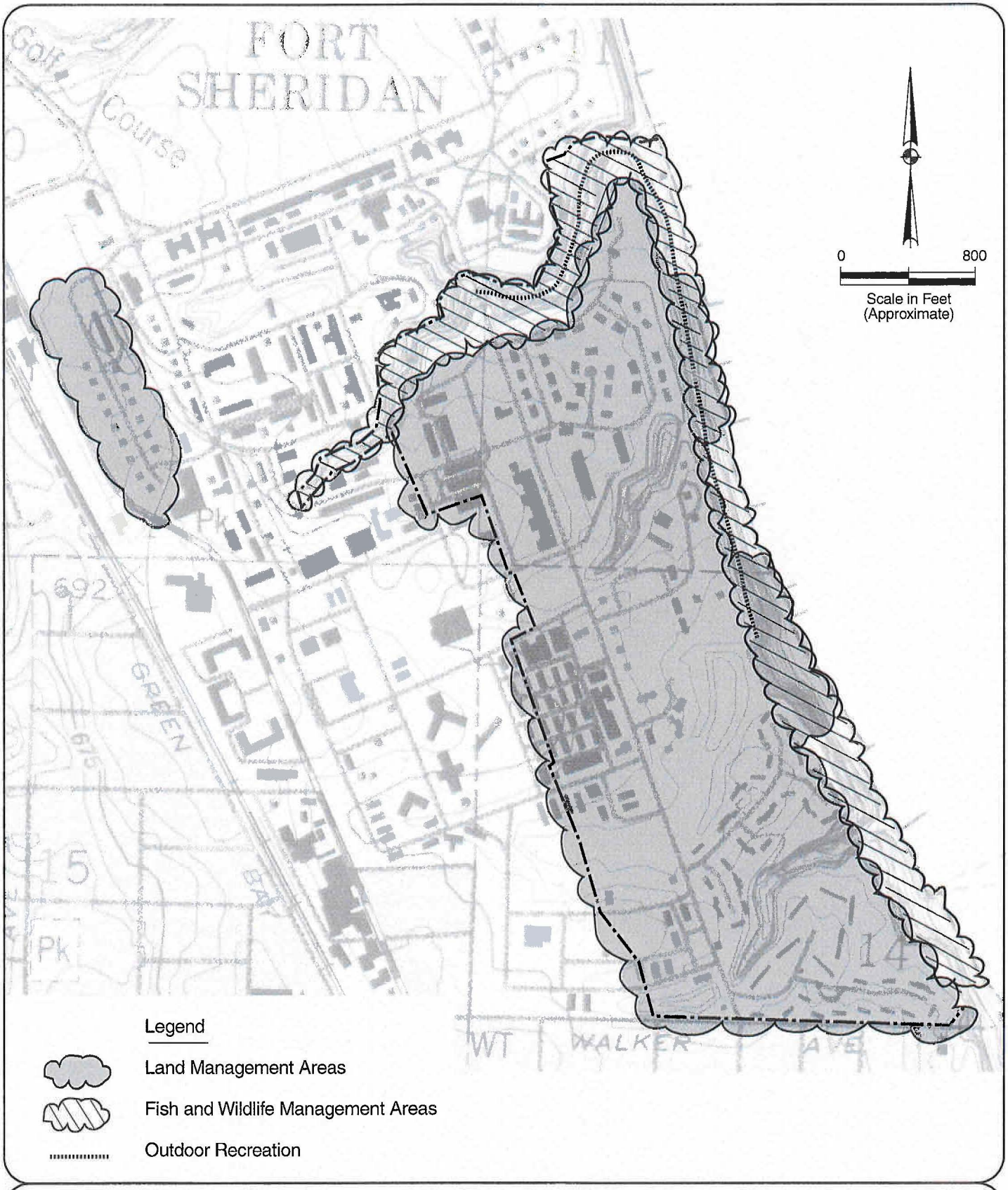


Figure 2-5. Alternative 2 - Moderate Intensity (FSHA)

Note: Multiply by 0.3048 to convert feet to meters.

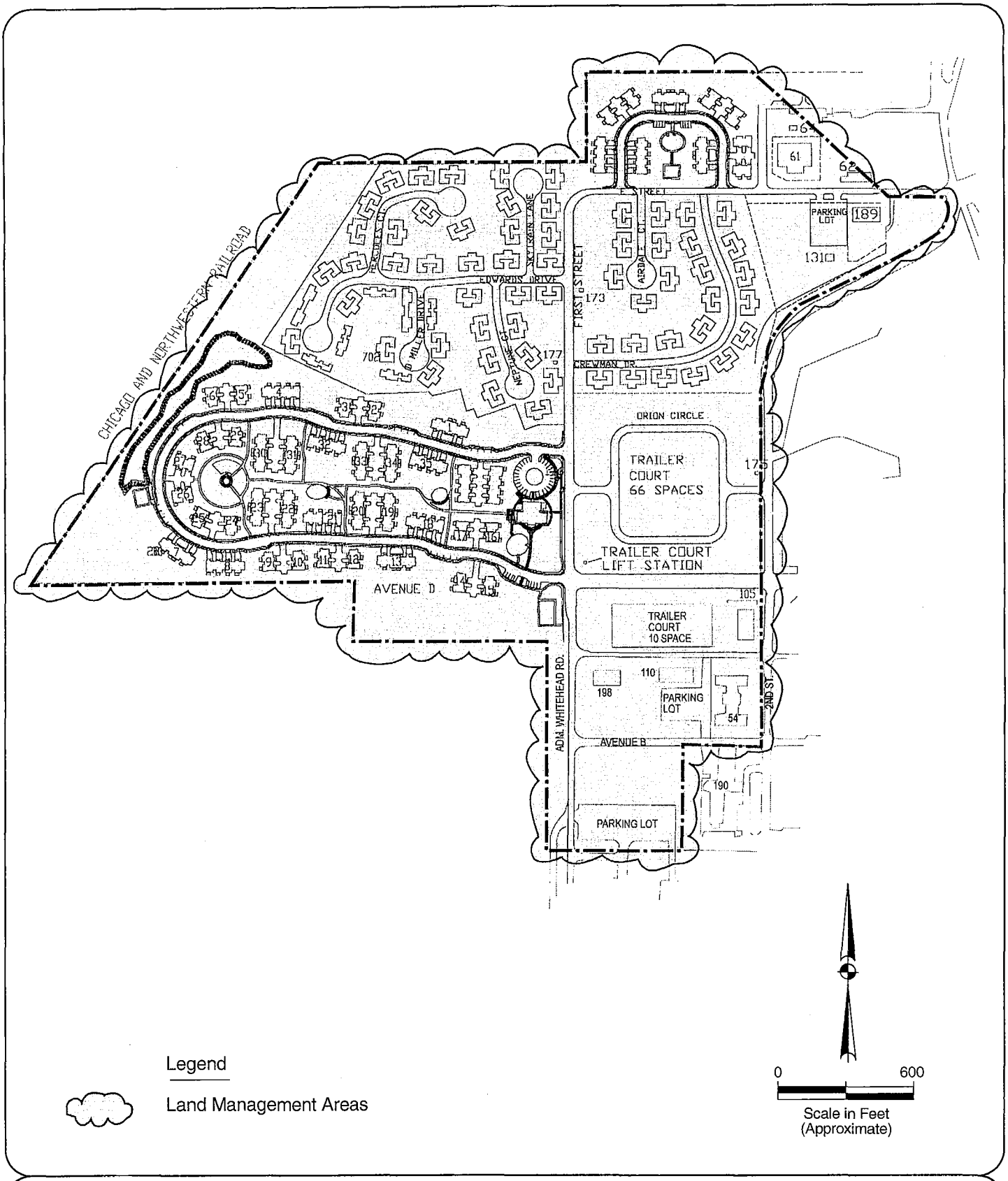


Figure 2-6. Alternative 2 - Moderate Intensity (GHA)

Note: Multiply by 0.3048 to convert feet to meters.

TABLE 2-3 STEWARDSHIP LAND MANAGEMENT PROJECTS

Action	Priority[1]	Legal Driver[1]
Develop and initiate an urban tree program, consisting of: tree survey, GIS database for management, periodic inspection program and prioritization of tree management projects	Stewardship	
Develop a policy on avoiding or mitigating losses of urban trees	Stewardship	
Study and determine feasibility of a composting center, project consisting of: regulatory and permit requirements, appropriate size, location, potential users and operations cost	Stewardship	
Implement a schedule and sample soil to improve landscape practices and reduce costs	Stewardship	
Create a no-mow strip at the tops of slopes and bluffs	Stewardship	
Modify mowing contracts to reflect a need-based mowing schedule (pending new contract)	Stewardship	
Evaluate Lake County Storm Water Management Commission's Storm Water ordinance	Stewardship	
Establish and implement a regular schedule for monitoring quality of water – entering, within, and discharged from waterways and in the harbor of Main Installation	Stewardship	
Establish and implement a regular schedule for monitoring quality of water – entering, within, and discharged from waterways of FSHA	Stewardship	
Select best qualified partners from outside agencies and other sources for creating partnership agreements for natural resources management[2]	Stewardship	
Develop a series of public events, self-study guides and multimedia programs that describe and showcase natural resources on NTC Great Lakes[2]	Stewardship	

TABLE 2-3 *cont'd*

Action	Priority[1]	Legal Driver[1]
Prepare press releases after completion of natural resources management projects on NTC Great Lakes[2]	Stewardship	

[1]Stewardship activities are those that are provided for, but not required by, Federal or state environmental laws, Executive Orders, or Naval Regulations in support of stewardship of natural resources on Federal lands.
[2] This stewardship project is applicable to land management, fish and wildlife management, and outdoor recreational opportunities.

TABLE 2-4 STEWARDSHIP FISH AND WILDLIFE MANAGEMENT PROJECTS

Action	Priority[1]	Legal Driver[1]
Restrict access to sand dunes/wetland communities by the general population	Stewardship	
Initiate talks and develop a cooperative agreement with Lake County Forest Preserve District for management of FSHA bluffs	Stewardship	
Develop a program for managing threatened and endangered species, including: estimating population sizes; map distributions and entering data into GIS database; identifying areas with poor/degrading habitats initiating methods of restoration at Main Installation and FSHA	Stewardship	
Implement recommendations by IDNR for protecting nesting colony of common terns on Main Installation	Stewardship	
Implement biological monitoring in Pettibone Creek	Stewardship	
Collaborate with biologists from State and Federal agencies on ways to improve fish habitat	Stewardship	
Develop a sediment monitoring plan for Inner and Outer Harbor	Stewardship	
Implement biological monitoring in Inner and Outer Harbor	Stewardship	
Open tree canopies on ravine slopes and bluffs to promote growth of herbaceous plants	Stewardship	
Plant herbaceous plants with value as wildlife food and cover on bluffs and ravine slopes	Stewardship	
Build and erect nest boxes in areas having native vegetation	Stewardship	
Identify areas important as nesting sites for migratory birds, restricting access by the general population and manage	Stewardship	
Create habitat requirements for and re-introduce small indigenous vertebrates on Pettibone and tributary ravine slopes	Stewardship	

TABLE 2-4 ***cont'd***

Action	Priority[1]	Legal Driver[1]
Select indicator species to monitor during regularly scheduled biological inventories, estimate population sizes, trends and determine effectiveness of management actions	Stewardship	
Modify conditions of ponds and other designated areas to make them less attractive to Canada geese	Stewardship	
Construct and erect bat boxes in appropriate areas	Stewardship	
Select best qualified partners from outside agencies and other sources for creating partnership agreements for natural resources management[2]	Stewardship	
Develop a series of public events, self-study guides and multimedia programs that describe and showcase natural resources on NTC Great Lakes[2]	Stewardship	
Prepare press releases after completion of natural resources management projects on NTC Great Lakes[2]	Stewardship	

[1]Stewardship activities are those that are provided for, but not required by, Federal or state environmental laws, Executive Orders, or Naval Regulations in support of stewardship of natural resources on Federal lands.
[2] This stewardship project is applicable to land management, fish and wildlife management, and outdoor recreational opportunities.

TABLE 2-5 STEWARDSHIP PROJECTS FOR OUTDOOR RECREATIONAL OPPORTUNITIES

Action	Priority[1]	Legal Driver[1]
Design and develop a nature trail on Main Installation and FSHA, emphasizing areas which showcase the unique flora, fauna, geology, etc., for both educational and recreational purposes	Stewardship	
Develop and conduct guided bird and wildflower tours on NTC Great Lakes	Stewardship	
Develop and conduct a youth fishing derby for DOD dependents and local community youth	Stewardship	
Select best qualified partners from outside agencies and other sources for creating partnership agreements for natural resources management[2]	Stewardship	
Develop a series of public events, self-study guides and multimedia programs that describe and showcase natural resources on NTC Great Lakes[2]	Stewardship	
Prepare press releases after completion of natural resources management projects on NTC Great Lakes[2]	Stewardship	

[1]Stewardship activities are those that are provided for, but not required by, Federal or state environmental laws, Executive Orders, or Naval Regulations in support of stewardship of natural resources on Federal lands.
[2] This stewardship project is applicable to land management, fish and wildlife management, and outdoor recreational opportunities.

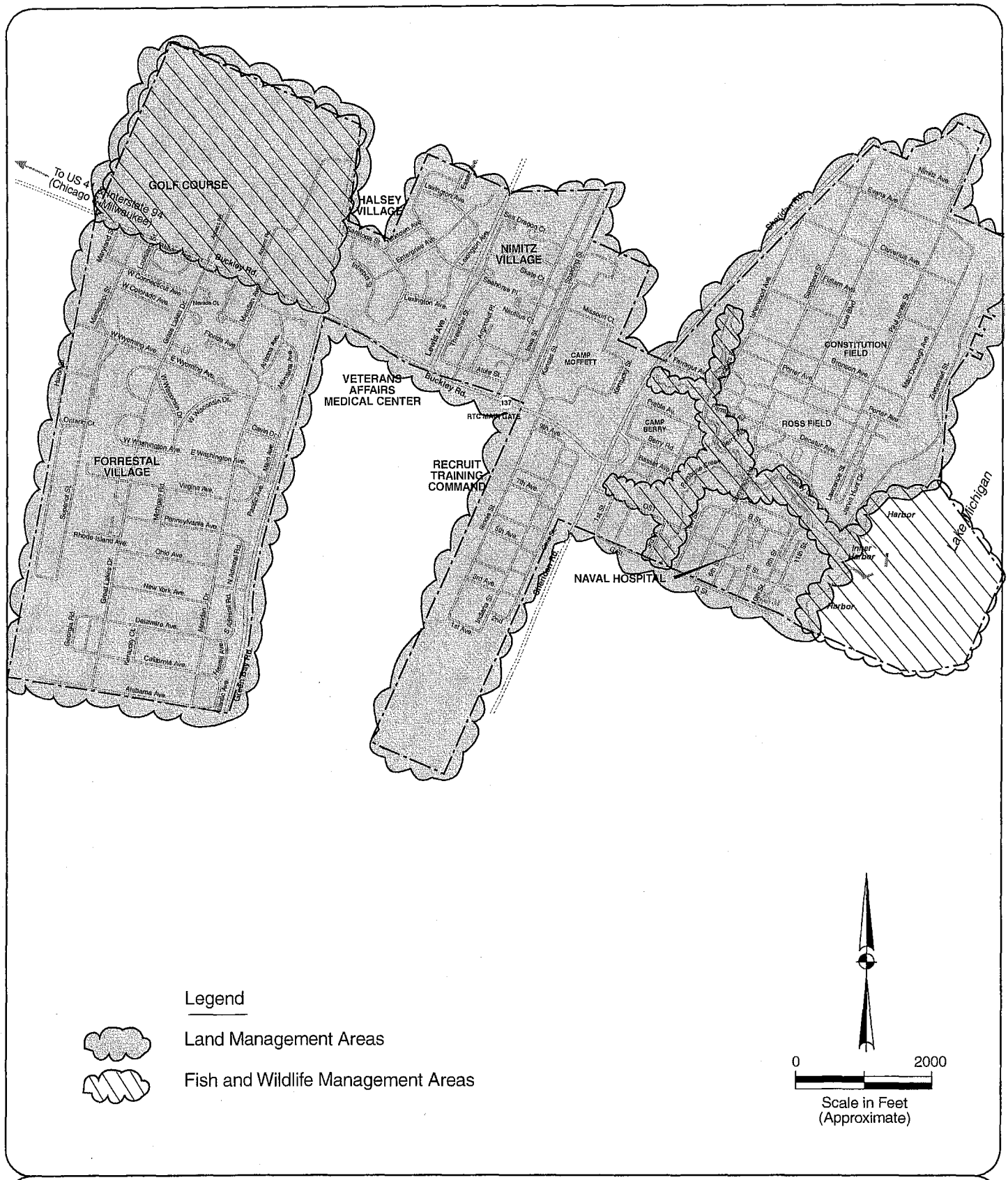


Figure 2-7. Existing Natural Resource Management Plan (Main Installation)

Note: Multiply by 0.3048 to convert feet to meters.

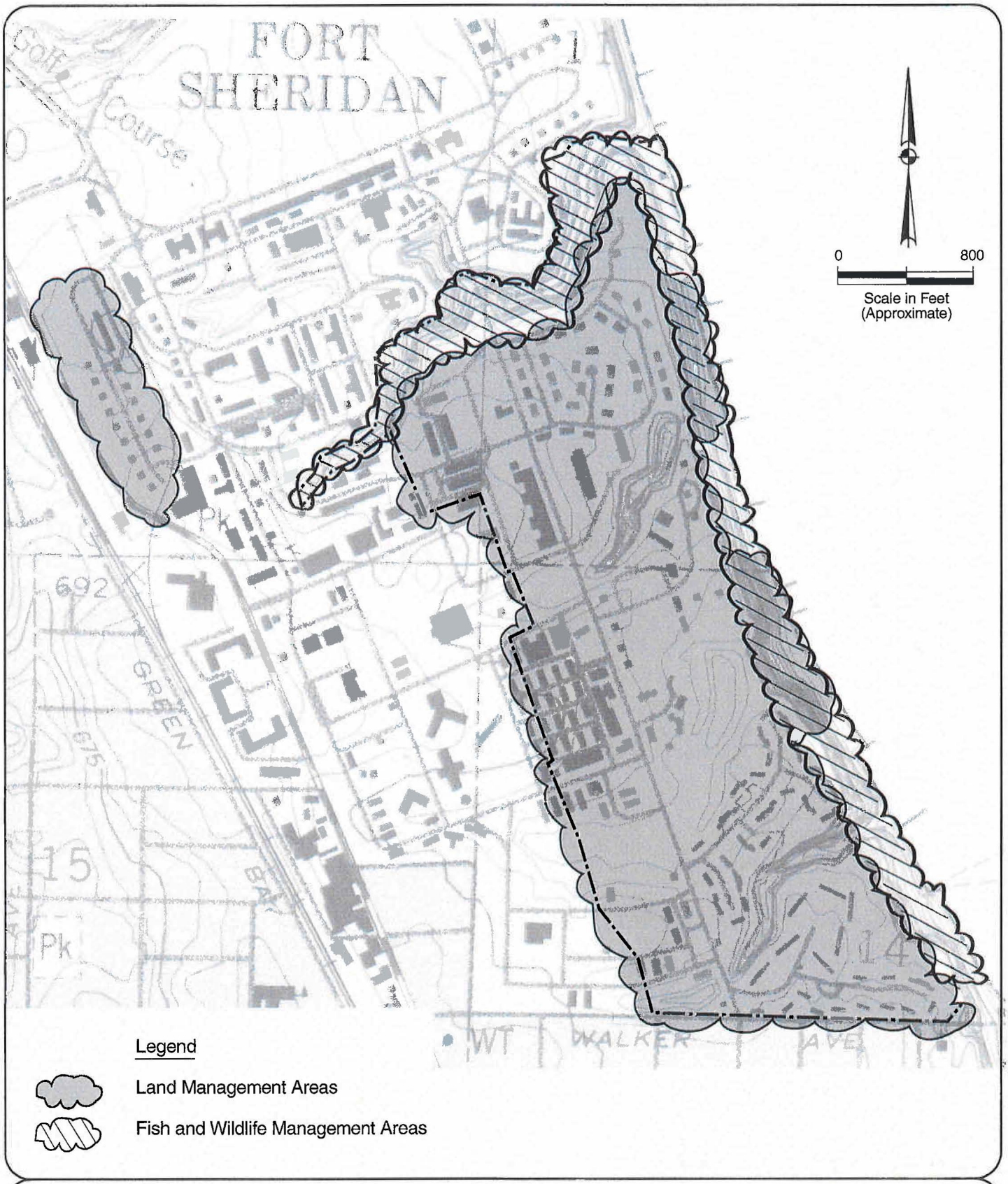


Figure 2-8. Existing Natural Resource Management Plan (FSHA)

Note: Multiply by 0.3048 to convert feet to meters.

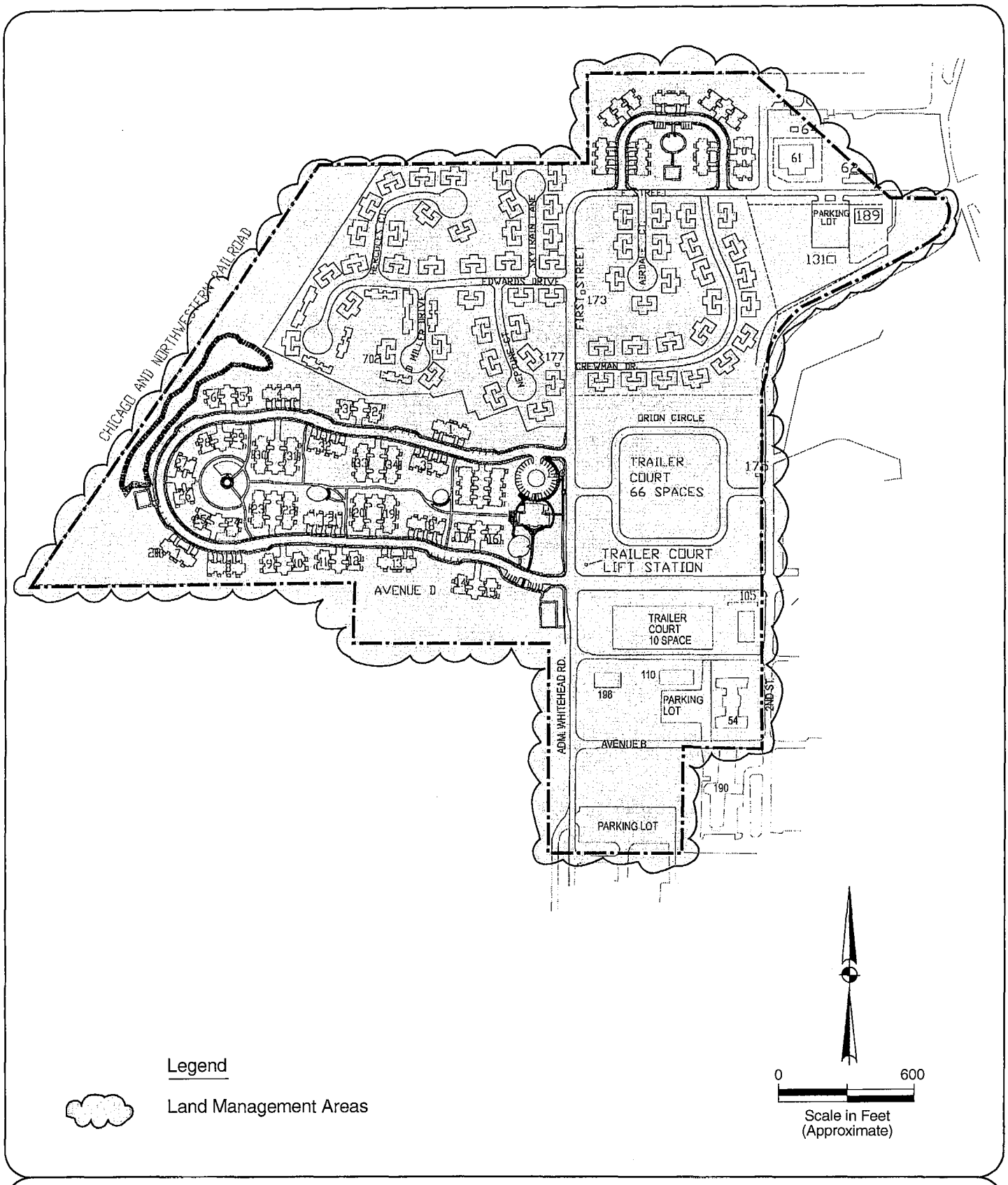


Figure 2-9. Existing Natural Resource Management Plan (GHA)

Note: Multiply by 0.3048 to convert feet to meters.

pruning and other landscape practices is provided. This information is still valid and valuable to the maintenance of an "acceptable level of appearance" of landscaped areas as required by OPNAVINST 5090.1B.

An environmental assessment for erosion control of the ravine slopes and bluffs of the Pettibone Creek ravine (U.S. Navy, 1993a) documented ten areas exhibiting extensive erosion problems that can threaten buildings and infrastructure necessary for the military mission, and reduce water quality in Pettibone Creek and Lake Michigan. A previous study (U.S. Navy, 1988) determined that Structures AA, 130, and 150 were threatened by slope failures that could lead to severe damage or loss of function of these building. Several other areas were identified as needing immediate remedial measures to preclude future slope stability or structural problems. Erosion control actions are covered, and are referenced to the 1993 Slope Stabilization Study with the recommendation that areas identified in this study be reviewed, prioritized, and remedial actions taken to prevent further losses of ravine and bluff slopes. No specific remedial actions, however, were made in this section of the 1995 NRMP.

Fish and Wildlife Management Section

This section of the 1995 NRMP documents the species of birds, mammals, herptiles, and fish documented on the Main Installation and FHSA, their relative abundance, and general management recommendations. The breeding and migratory bird survey discusses at length the methods used to conduct the surveys, results of the 1995 and previously conducted surveys, and lists species on the Federal and State threatened and endangered lists. Management recommendations are to:

- Repeat surveys periodically to monitor for changes in populations of all species, but more specifically for threatened or endangered species known to migrate through or nest on the Main Installation or FSHA.
- Conduct habitat enhancement and slope stabilization actions on the bluffs, ravines, and lakeshore areas, including removing concrete and building debris from the slopes of Pettibone Ravine and protecting the panne community in the harbor area.

The Fish and Wildlife Management Section of the 1995 NRMP also contains the results of a faunal survey for amphibians, reptiles, mammals, and fish. For some species considered potential problems or in need of management to maintain populations, management recommendations are given but no specific, detailed plans are included. Management recommendations address known and suspected impacts to the fauna present on, and in some cases absent from, the Installation. These management recommendations, however, are framed in the context of wildlife management only and not necessarily integrated with land management and outdoor recreation activities.

Hunting and trapping on the Main Installation, FSHA, and GHA are prohibited because of the small amount of natural area and the risk to Navy personnel, their dependents, and visitors to the installations. Therefore, no game warden is assigned to the Main Installation, FSHA, or GHA. Fishing along the shore of Lake Michigan is permitted, and is regulated by the laws of the State of Illinois.

The floral survey is comprehensive across the Main Installation and FSHA, and identifies numerous State-listed threatened and endangered species and invasive exotic plants. Protection and management of sensitive habitats, such as the panne and dune communities, are covered by a series of recommended actions. Again, these recommendations are specific actions to accomplish one goal and are not necessarily integrated with land management and outdoor recreation management activities.

Outdoor Recreation Section

NTC Great Lakes was exempted from developing an outdoor recreation section to the 1995 NRMP (U.S. Navy, 1997a), the reason being the limited amount of natural area on the Main Installation and FSHA. This exemption does not mean that opportunities for outdoor recreation are not present, or that organized outdoor recreation activities are not conducted on NTC Great Lakes. The outdoor recreation activities that do take place are not included within the 1995 NRMP.

Forestry Management Section

NTC Great Lakes currently does not control any lands suitable, or having the potential, for forestry management. NTC Great Lakes is exempt from the Forestry Management provisions of the Sikes Act (U.S. Navy, 1997a). Therefore, the 1995 NRMP does not have a forestry management section.

The current NRMP does not provide for four of the ten requirements established in SAIA. The following four requirements are not fully met by the current plan:

- Fish and wildlife habitat enhancement or modifications
- Integration of and consistency among the various activities conducted under the plan
- Establishment of specific natural resources management goals and objectives and time frames for proposed actions
- Sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of the fish and wildlife resources

Because the current NRMP does not meet the requirements and management objectives of SAIA, the No Action Alternative was eliminated from further consideration consistent with Department of the Navy guidance on preparing NEPA documents for INRMPs (U.S. Navy, 1998b).

3.0 AFFECTED ENVIRONMENTAL

This section contains a description of the existing environment at NTC Great Lakes. It provides information to serve as a baseline from which to identify and evaluate environmental consequences resulting from the proposed action. Resources evaluated are presented in three major categories, which represent major environmental components of the area: physical, biological, and socioeconomic.

3.1 PHYSICAL ENVIRONMENT

The Main Installation is located in Lake County, Illinois, in the northeastern portion of the state within the municipality of North Chicago (*Figures 1-1* and *1-2*), bordered by Lake Michigan to the east, industrial areas of North Chicago to the north, residential areas of Lake Bluff to the south, and unincorporated Shields Township to the west. The GHA is located south-southwest of the Main Installation off U.S. Highway 41 in Cook County (*Figures 1-1* and *1-3*). The FSHA is located south of the Main Installation, within the city limits of Highland Park, off Sheridan Road and is bordered by Lake Michigan on the East (*Figures 1-1* and *1-4*).

3.1.1 Earth Resources

Topography

Main Installation and Fort Sheridan Housing Annex

The Main Installation is located on the Waukegan, Illinois 7.5-minute topographic quadrangle map (*Figure 3-1*) and FSHA on the Highland Park, Illinois quadrangle map (*Figure 3-2*) (U.S. Geological Survey [USGS], 1993a, 1993b, and 1995). These sites generally consist of level lands bordered by steep bluffs that face Lake Michigan with a network of interior ravines. The eastern boundaries of the Main Installation and FSHA are beaches located on the western shore of Lake Michigan at an elevation of 580 feet (177 meters [m]) above sea level. The steep bluffs immediately behind the beaches reach elevations of approximately 650 feet (198 m) above sea level at the Main Installation, and approximately 625 feet (191 m) at FSHA. At the Main Installation, the elevation of the plateau above the bluff ranges from approximately 650 to 700 feet (198 to 213 m) above sea level. Slopes in this area range from 1.0 and 1.5 percent. The plateau is rather flat except for dissection by the branching ravine system of Pettibone Creek and its tributaries. The ravine system defines the boundaries between different areas of the Main Installation. The Pettibone Creek system consists of a north and south fork that merge and flow east into Lake Michigan via the Boat Basin. The creek has a moderate to steep gradient and varies from 15 to 30 feet (5 to 9 m) in width and from 3.0 inches (7.6 centimeters [cm]) to over 6.0 feet (1.8 m) in depth. The ravine is between 50 to 100 feet (15 to 30 m) in height with slopes of approximately 30 to 70 degrees. The major drainage divide of this region is found approximately 4 miles (6.4 km) inland from Lake Michigan along Green Bay Road at an elevation of 710 feet (216 m) above sea level. The Main Installation west of Green Bay Road is located within the Skokie Drainage Basin, part of the Mississippi River Watershed (U.S. Navy, 1994). FSHA, from the crest of the bluff to its western boundary along Sheridan Road, is typically gentle hills with elevations ranging from 625 to 700 feet (190 to 213 m) above sea level.

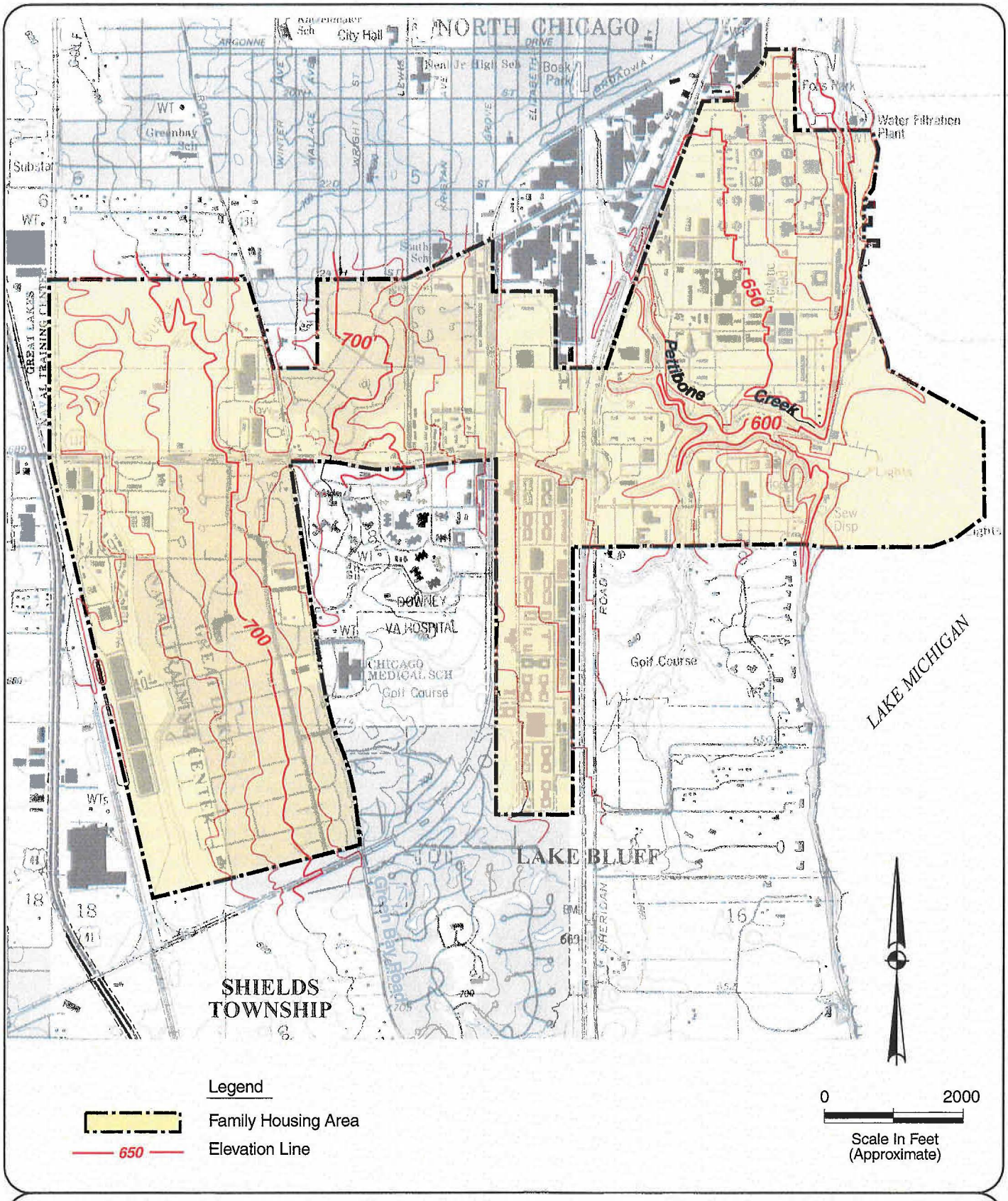


Figure 3-1. Main Installation - Elevation Map

Note: To convert feet to meters, multiply by 0.3048.

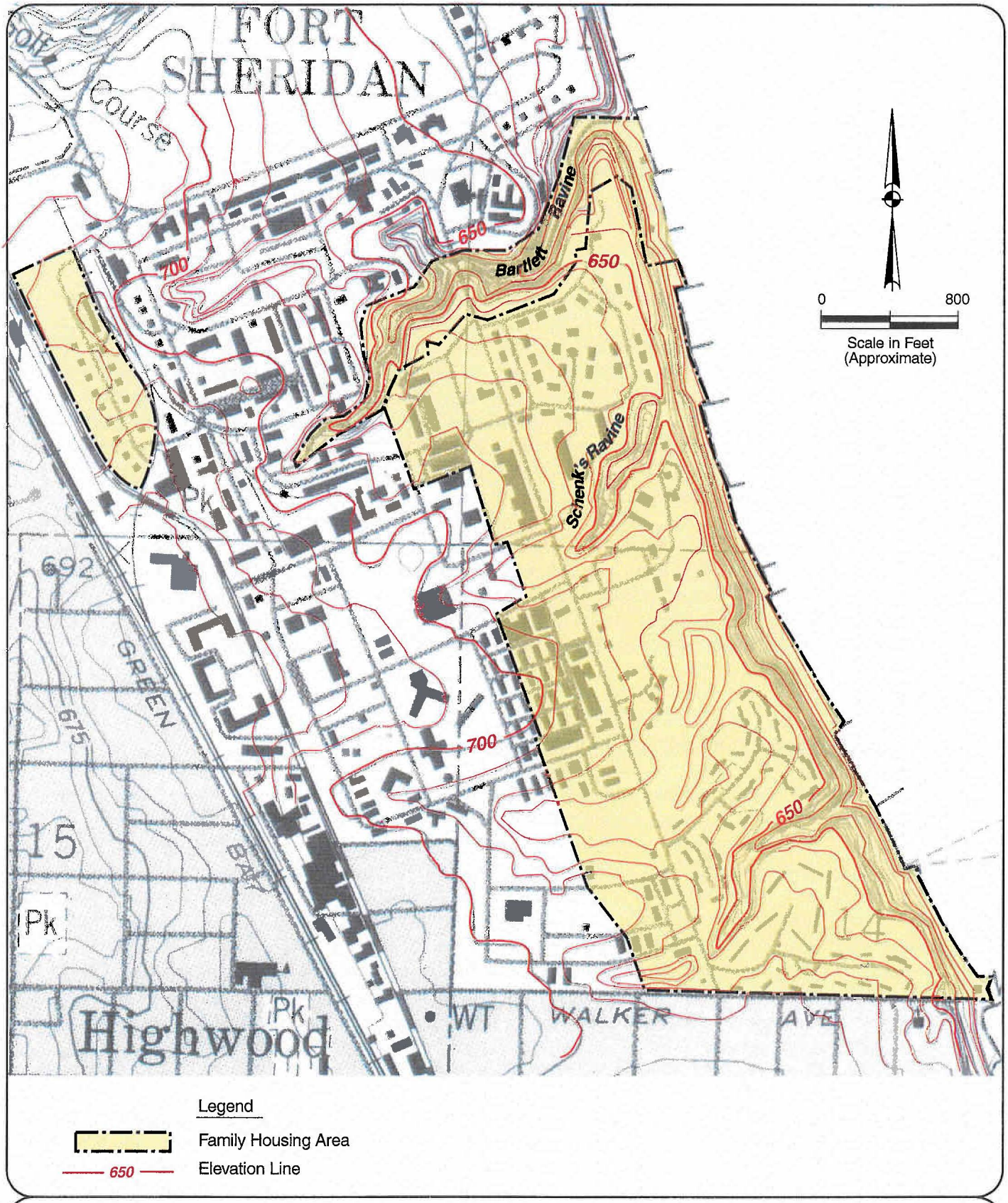


Figure 3-2. Fort Sheridan Housing Annex - Elevation Map

Note: Multiply by 0.3048 to convert feet to meters.

Glenview Housing Annex

GHA is located on the Park Glen, Illinois quadrangle map (*Figure 3-3*). GHA is generally level, ranging in elevation from 630 to 655 feet (192 to 200 m) above sea level. GHA is located about 8 miles (13 km) inland from Lake Michigan and lacks the system of ravines and bluffs found on The Main Installation and FSHA. The land surface is generally flat with slopes ranging from 0.0 to 2.0 percent (U.S. Navy, 1994).

Geology

The Main Installation, FSHA, and GHA are located on the Wheaton Morainal Complex of the Great Lakes Section of the Central Lowland Province (U.S. Navy, 1998a). The geology of this region is described as unconsolidated glacial till of the Equality Formation overlying Silurian age dolomite. A general geologic description from ground surface to bedrock is 100 to 150 feet (30 to 46 m) of fine-grained till underlain by 10 to 50 feet (3 to 15 m) of sand and gravel. The sand and gravel is underlain by 10 to 50 feet (3 to 15 m) of fine-grained till that overlays Silurian-age dolomitic bedrock (U.S. Navy, 1998c). The most recent period of glaciation is primarily responsible for present-day landforms (Soil Conservation Service [SCS], 1970). The unconsolidated glacial deposits range in thickness from 100 to 300 feet (30 to 91 m).

Northeastern Illinois is located within a region of minimal seismic activity. The seismic zone defined by the Universal Building Code for the Main Installation and FSHA is 0 (on a scale from 0 to 4) (U.S. Navy, 1998a and ICBO, 1988). This designation indicates that the probability of a property-damaging earthquake is low (U.S. Navy, 1998a). The seismic zone of GHA is 2, which indicates a relatively minor risk of damage from an earthquake (U.S. Navy, 1994).

Soils

Main Installation and Fort Sheridan Housing Annex

The predominant soil type at the Main Installation is classified as Made Land (*Figure 3-4*). Made Land consists of areas of manmade cuts and fills and areas covered almost entirely with roads and buildings. The cuts are made to a number of unspecified depths, and the fill consists of various materials, including materials that are not classified as "soil" (SCS, 1970). Some of these areas have been filled with coal fines or cinders from the former on-site coal-fueled power plant (U.S. Navy, 1998a). The remaining soil series on the Main Installation east of Sheridan Road include Hennepin loam (30 to 60 percent slopes) in the ravines and the bluffs, Beecher silt loam (0.0 to 2.0 percent, and 2.0 to 4.0 percent slopes), and beach sand along Lake Michigan (SCS, 1970). The soil on the steep slopes is best suited for providing wildlife habitat, forestry, and outdoor recreation opportunities. Beecher silt loam is found on level to gently sloping terrain that is somewhat poorly drained. Clayey subsoil limits water movement and maintains a seasonal high water table. This soil is best suited for farming when it occurs in agricultural areas.

West of Sheridan Road, the predominant soils on the Main Installation are Made Land, Morley silt loam, Grays silt loam, and Grays and Markham silt loam. Less common soils on the Main Installation include Wauconda and Frankfort silt loam, Wauconda silt loam, Markham silt loam, and Peotone and Ashkum silty clay loam. The soils found at FSHA are the same as those discussed for the Main Installation (see *Figure 3-5*). Detailed soil descriptions for the soils discussed in this section are available for download at *www.statlab.iastate.edu/cgi-bin/osd/osdname.cgi*. This site is

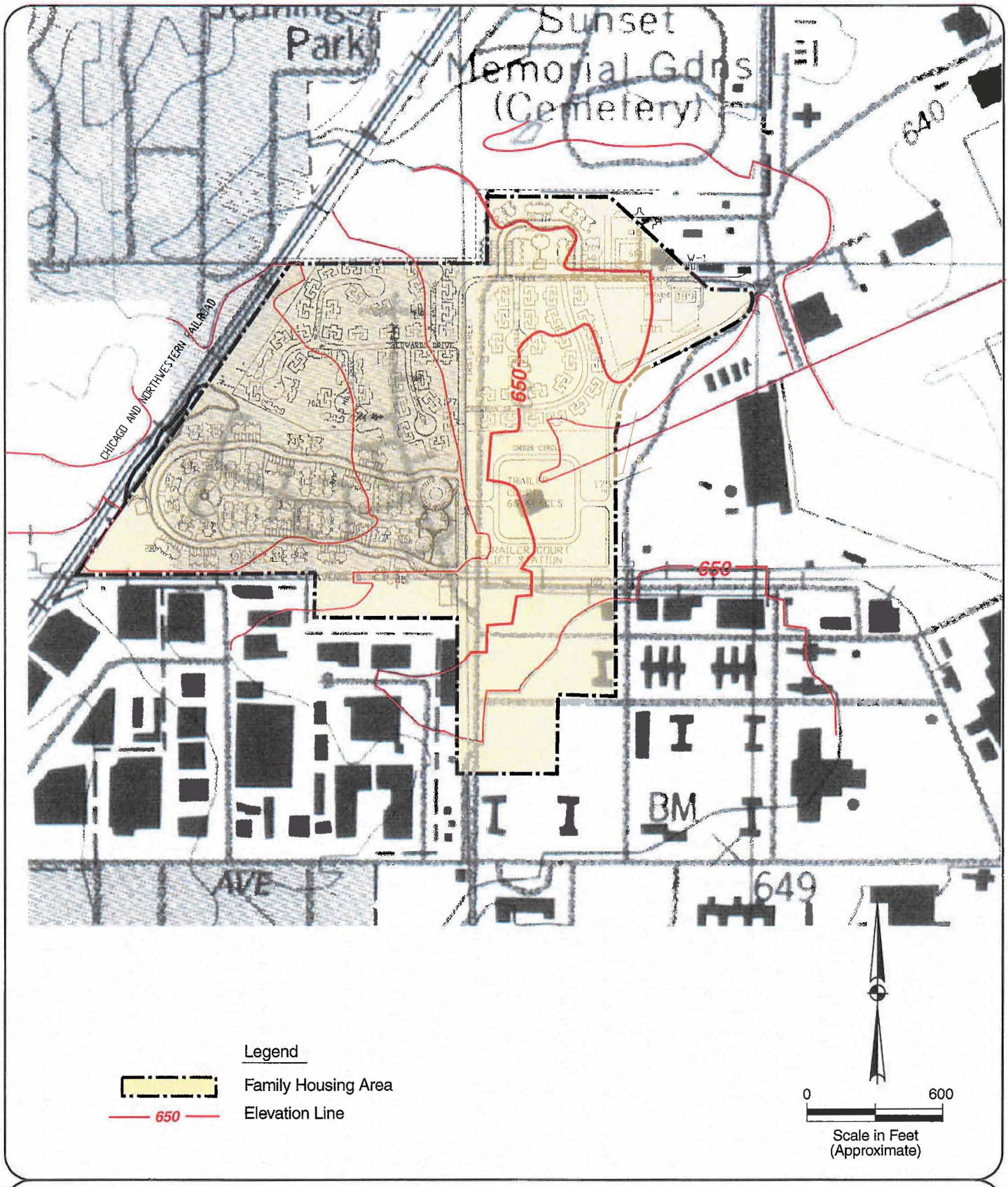
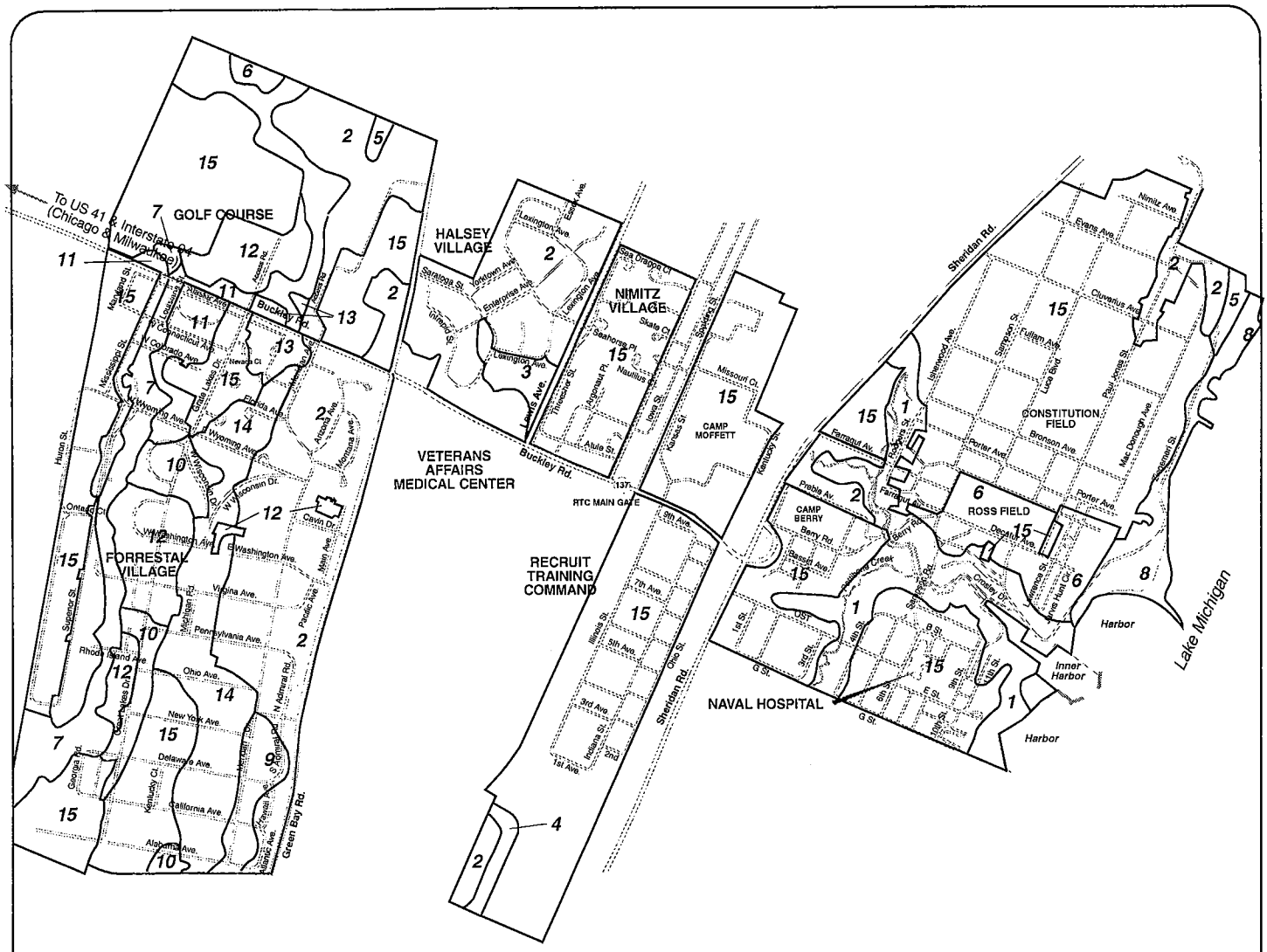


Figure 3-3. Glenview Housing Annex - Elevation Map

Note: Multiply by 0.3048 to convert feet to meters.



Legend

———	Soil mapping boundary
1	Hennepin loam, 30 to 60% slopes
2	Marley silt loam, 0% to 2% slopes
3	Marley silt loam, 4% to 7% slopes
4	Marley silt loam, 7% to 12% slopes
5	Ashkum silty clay loam
6	Beecher silty loam, 0% to 2% slopes
7	Peotone silty clay loam
8	Beach sand
9	Markham silt loam, 1% to 4% slopes
10	Wauconda silt loam, 0% to 2% slopes
11	Grays silt loam, 0% to 2% slopes
12	Grays silt loam, 2% to 4% slopes
13	Grays and Markham silt loams, 0% to 2% slopes
14	Grays and Markham silt loams, 2% to 4% slopes
15	Made land

0 2000

Scale in Feet (Approximate)

Figure 3-4. Main Installation - Soils Map

Note: Multiply by 0.3048 to convert feet to meters.

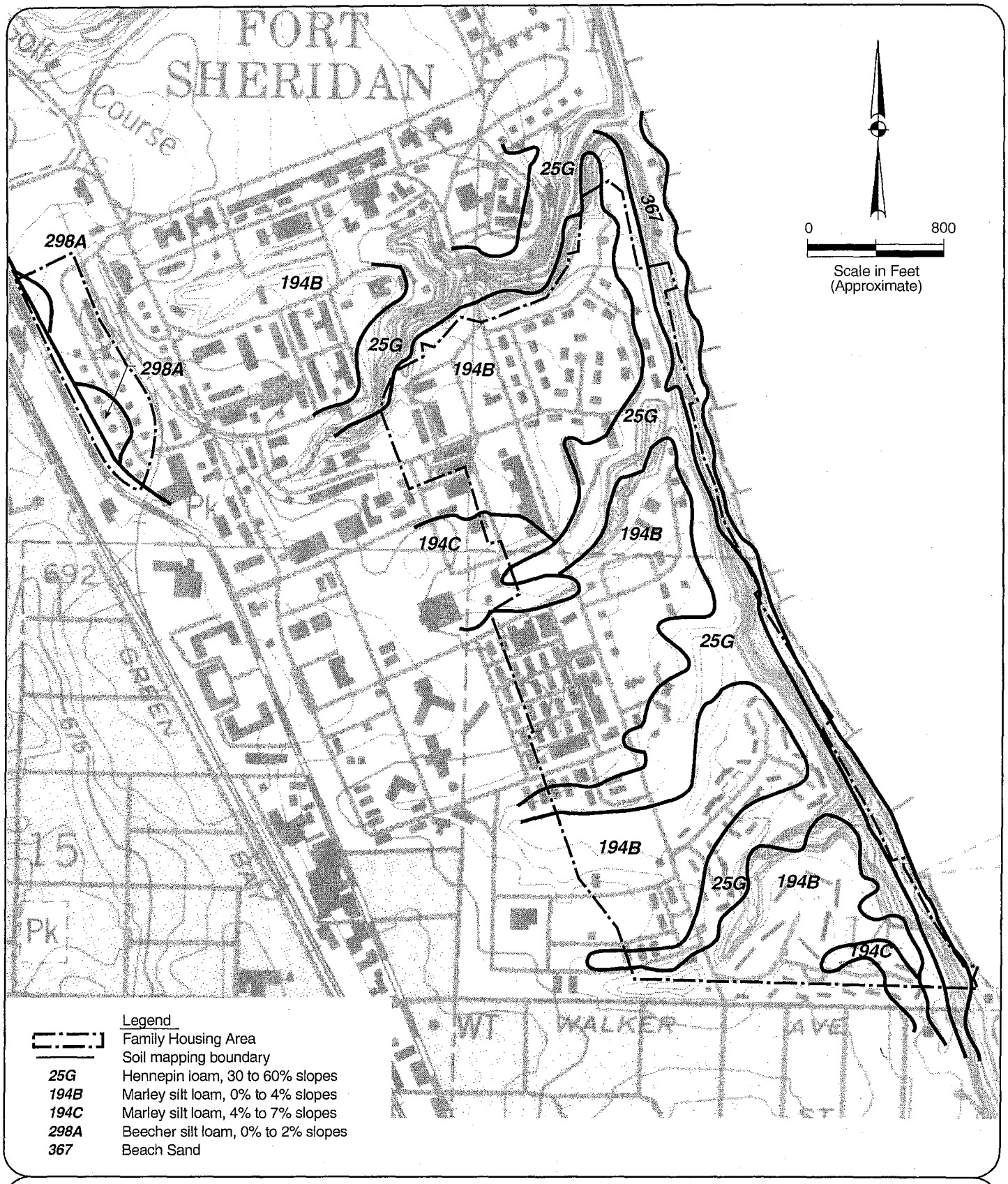


Figure 3-5. Fort Sheridan Housing Annex - Soil Map

Note: Multiply by 0.3048 to convert feet to meters.

the official repository of Natural Resource Conservation Service soil descriptions, and documents on the Internet site are updated as the soil descriptions are revised.

The slopes of Pettibone Ravine are unstable in many locations, and are eroding in specific areas (*Figure 3-6*). Portions of the ravine are affected by undercutting, bank slumping, and structural rotational failures that vary in degree (*Figure 3-7*). These conditions can threaten structures at the tops of the ravines, and the military mission (U.S. Navy, 1988 and 1993b). A survey of Pettibone Ravine and bluffs on Main Installation, completed in January 1999, identified 37 specific sites having significant erosion problems or impending slope failure (*Figure 3-8, Table 3-1*). Erosion and slope failure at the majority of these sites are predicted to substantially increase repair and recovery costs if not corrected.

Construction of infrastructure in support of the military mission has also disturbed soils and native vegetation within Pettibone Ravine. This infrastructure includes a service road located along the north bank of Pettibone Creek at the toe of the ravine slopes, several now abandoned ammunitions bunkers built into the ravine, steam delivery pipes, bridges, and storm sewers. These structures are contributing to increased rates of soil erosion observed within the ravine. The soil erosion has the potential to cause structural damage to infrastructure and interfere with the military mission. A survey within Pettibone Ravine showed numerous storm sewers and bridge foundations that are now exposed and contributing to rapid soil erosion around these structures (*Figure 3-9*). Broken concrete rubble was placed on slope faces (*Figure 3-6*) near the parking lot of Building 111 in an effort to stabilize the area, but this effort has failed.

Erosion is also occurring along the lakefront bluffs and beaches at both the Main Installation and FSHA, threatening damage to the structures and infrastructure on the tops and slopes of the bluffs (*Figures 3-10* and *3-11*). These problems are a result of man's development in the area that has disturbed the natural vegetation cover, drainage, and littoral drift and beach formation process in the area.

Glenview Housing Annex

Three soil map units are found on GHA: Urban Land, Urban Land – Udorthents clayey and complex, and Dumps – Udorthents clayey and complex (*Figure 3-12*) (U.S. Navy, 1994). Most of these soils are poorly drained silty and/or clayey loams, with underlying clay or till in some units. The soils have been greatly altered by human activity and contain in excess of 50 percent man-made materials (SCS, 1970). GHA does not have any of the erosion problems that occur at the Main Installation or FSHA.

3.1.2 Air Resources

The project area is located in the Metropolitan Chicago Interstate (Illinois-Indiana) Air Quality Control Region (AQCR). The Metropolitan Chicago Interstate AQCR is classified as a severe *non-attainment* area for ozone due to the recorded exceedances of the National Ambient Air Quality Standards (NAAQS) for ozone (one-hour per day reading of greater than 0.12 parts per million [ppm]). The current standard for ozone is 0.08 ppm for an eight-hour period. *Table 3-2* presents the NAAQS for the region. All other pollutants are in compliance with the standards. The closest air-monitoring station to the Main Installation is located in Waukegan, Illinois. During 1999, this station recorded a one-hour high of 0.116 ppm for ozone, and an eight-hour high of 0.093 ppm (Illinois EPA, 1999).

Photo A - Erosion in Pettibone Ravine resulting from storm water runoff being directed into the ravine instead of a storm sewer.

Photo B - Large section of storm sewer undercut and exposed by erosion and slope failure.

Photo C - Concrete debris near Bunker 24D that is contributing to slope erosion.

Figure 3-6. Erosion occurring within Pettibone Ravine

Photo A - A section of Pettibone Ravine that has slumped and become revegetated.

Photo B - A section of Pettibone Ravine that has slumped recently.

Photo C - A section at the top of Pettibone Ravine that has slumped recently.

Figure 3-7. Slope Failure occurring in and on top of Pettibone Ravine

Figure 3-8. Slope Failure and Erosion Locations on Main Installation

Note: Multiply by 0.3048 to convert feet to meters.

TABLE 3-1 AREAS EXPERIENCING EXTREME EROSION OR SLOPE FAILURE ON MAIN INSTALLATION IDENTIFIED DURING A SURVEY CONDUCTED IN 1998

Site[1]	Site Description	Observed Conditions	Observed or Potential Impacts	Issues[2]
1	SW corner of Building 130 parking lot	> 10,000 yd^3 eroded; damage to full slope length	Storm drain and parking lot	SD/IR
2	S side of Building 130 parking lot	> 1,000 yd^3 eroded; slope failure	Parking lot	SD/IR
3	S side and between Building 76 and 130	> 500 linear ft. of degradations and failures	Damaged fence; top of slope < 12 ft. from building foundations	SD/IR
4	15 ft. E of Building 42	> 350 linear ft. of degradations and failures	Damaged fence; top of slope < 25 ft. from building foundations	SD/IR
5	W side of Rodgers St.; W of Building 177	> 200 linear ft. of eroding and failing slope	Parking lot	SD/IR
6	NW corner of Camp Barry Bridge	> 500 linear ft. of eroding and failing slope	Sedimentation of Pettibone Creek, uprooting of trees	NPSP
7	SE corner of Camp Barry Bridge	> 500 linear ft. of eroding and failing slope	Storm sewer outfall	SD/IR NPSP
8	S and SW of Buildings 24 and 24A	> 800 linear ft. of eroding and failing slope	Storm sewer outfall	SD/IR NPSP
9	Crosley Dr.	> 4,500 linear ft. of road in poor condition	Service road, exercise path	SD/IR
10	SE of Building 152 parking lot	Erosion forming a gully	Parking lot; sedimentation of Pettibone Creek	SD/IR NPSP
11	NE of Building 152 parking lot	Surface erosion	Parking lot; sedimentation of Pettibone Creek	SD/IR NPSP
12	N of Building 154	500 yd^3 eroded; slope failure	Sedimentation of Pettibone Creek	NPSP
13	Steam lines SE of Building 180	Eroding and failing slope forming gullies	Aboveground steam lines and supports	SD/IR
14	Steam lines E of Building 180	> 300 linear ft. of slope failure and erosion	Aboveground steam lines and supports	SD/IR
15A	Slope on S side of road at Boat Basin	Eroding and failing slope	Access road; sedimentation of Boat Basin	SD/IR NPSP
15B	Road from Boat Basin to Hospital	720 linear ft. of eroding slope; sides inclining 4 to 150 ft.	Access road; storm sewers; sedimentation of Boat Basin	SD/IR NPSP
16	S of Building 142 – Family Housing Unit	12 linear ft. of slope degradation; > 1,000 yd^3 eroded	Back yard of family housing unit	NPSP
17	S of Building 142 – Family Housing Unit	Slope degradation; approximately 2,000 yd^3 eroded	Back yard to family housing unit	NPSP
18	S of Building 142 – Family Housing Unit	Slope degradation; > 2,000 yd^3 eroded	Back yard to family housing unit	NPSP
19	Base of Sampson St. Bridge	Erosion around base of bridge; riprap dislodged	Sampson St. Bridge; sedimentation of Pettibone Creek	SD/IR NPSP

TABLE 3-1 Continued

Site[1]	Site Description	Observed Conditions	Observed or Potential Impacts	Issues[2]
20	SW of Building 73	> 10,000 yd^3 eroded; general slope degradation	Building 73 and adjacent parking lot	SD/IR
21	NE of Building 42	> 3,000 yd^3 eroded;	Storm sewer	SD/IR
22	SE of Building 203	Slope erosion and degradation	Family Housing Quarters	SD/IR NPSP
23	NE of Building 202	Slope erosion and degradation	Family Housing Quarters	SD/IR NPSP
24	N of Building 202	> 700 linear ft. of slope degradation and erosion	Top of slope 15 ft. from Building 202, < 3 ft. from parking garage	SD/IR
25	Slope SE of Quarters A	Damaged and failing retaining wall	Steam line at slope base	SD/IR
26	Slope E of Quarters A	Slope erosion and failure; very sparse vegetation cover	Steam line at slope base	SD/IR
27	Slope E of Quarters A to Quarters F	Slope erosion and failure; very sparse vegetation cover	Steam line at slope base	SD/IR
28	Slope E of Quarters F	Damaged and failing retaining wall	Road at slope base	SD/IR
29	Slope E of Quarters H	Slope erosion and failure; very sparse vegetation cover	Buildings 12A to 12C	SD/IR
30	E side of Building 140	> 1,000 yd^3 eroded;	Top of slope < 15 ft. from sidewalk, 25 ft. from Building 140	SD/IR
31	E side of Building 62	> 25,000 yd^3 eroded; very sparse vegetation cover	Top of slope < 35 ft. from Building 62	SD/IR NPSP
32	E side of Building 616 and parking area	Slope failure	Top of slope < 1 ft. from paved parking and surface road	SD/IR
33	NE of Building 616	> 25,000 yd^3 eroded;	Top of slope 8 ft. from road; Building 616	SD/IR NPSP
34	Gravel parking lot E of Building 621	> 25,000 yd^3 eroded;	Parking lot; discharge of sediment into Lake Michigan	SD/IR NPSP
35	N side of Downes Dr.	> 500 linear ft. by 35 linear ft. area of slope with sparse vegetation cover	Slope < 1 foot from road; discharge of sediment into storm sewer system	SD/IR NPSP
36	W end of Downes Dr., W of Building 143	> 400 linear ft. by 35 linear ft. area of slope with sparse vegetation cover	Top of slope 10 ft. from Family Housing Quarters	SD/IR
37	Slope between Mahan Rd. and Building 1A parking lot	> 500 linear ft. of slope failure and erosion; sparse vegetation cover	Mahan Rd; sedimentation of Pettibone Creek	SD/IR NPSP

(1) Site numbers correspond to those on *Figure 3-8*.
(2) SD/IR = Structural Damage/Increased Repair Costs
NPSP = Non-Point Source Pollution

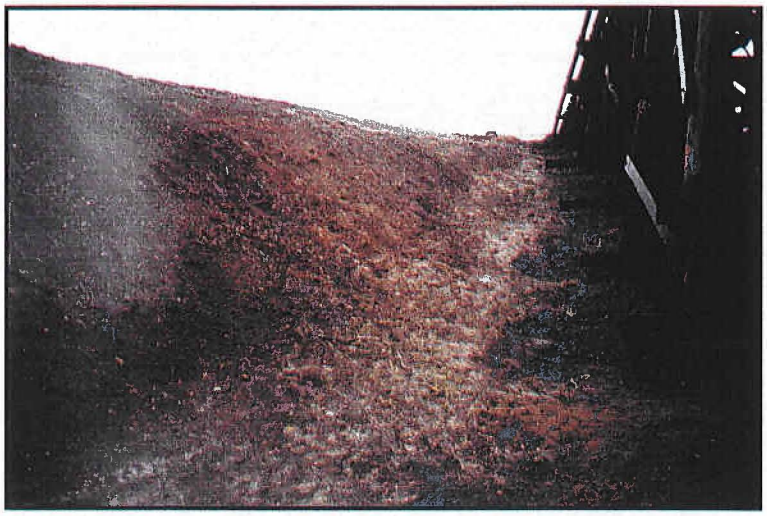
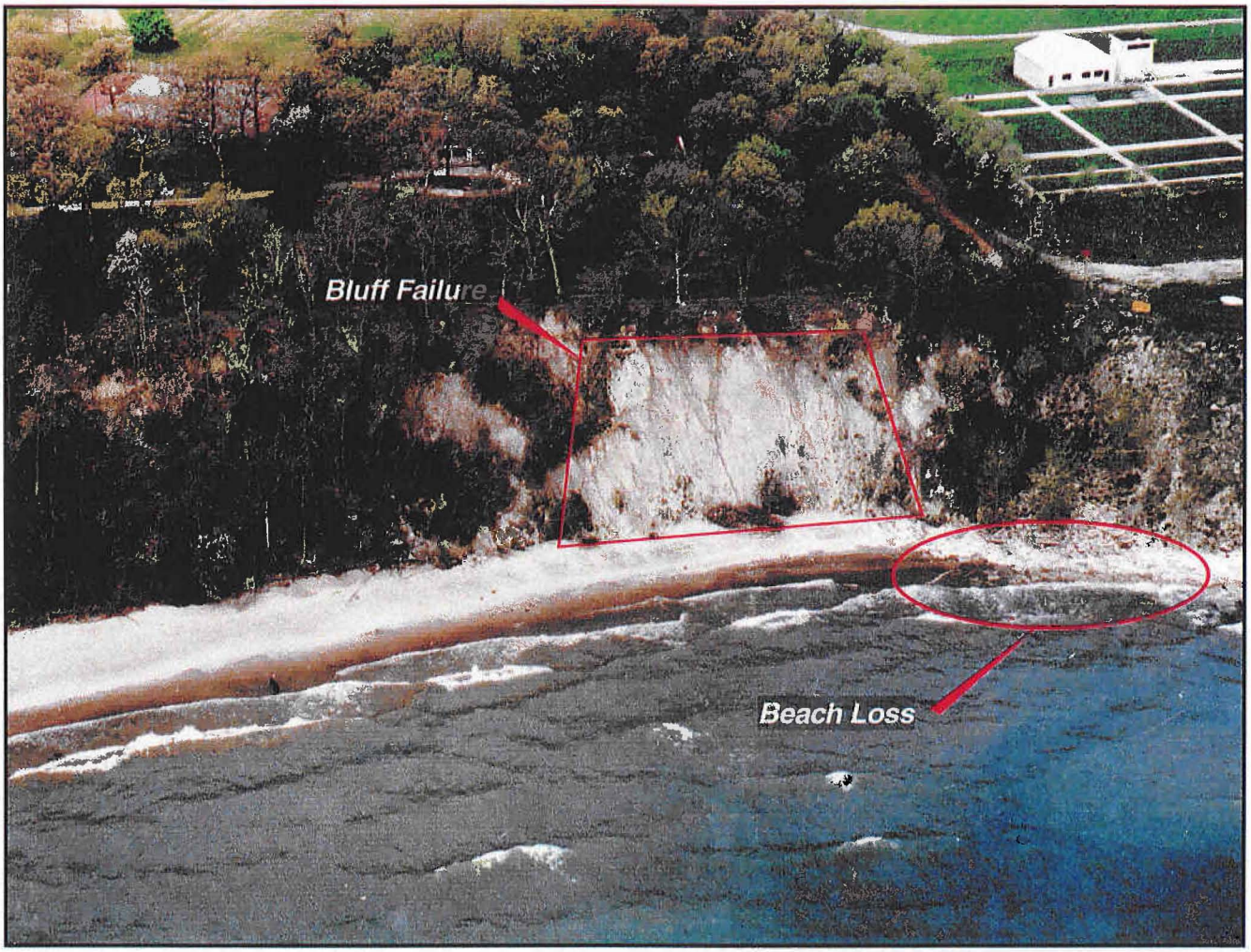


Photo A - Exposed soil near a trestle carrying utility lines experiencing excessive erosion.

Photo B - Example of erosion occurring around storm sewer outfalls in Pettibone Ravine from surface runoff and high water flowing behind
the outfalls.

Photo C - Example of slope loss from erosion and slope failure occurring around storm sewer outfalls in Pettibone Ravine.

Figure 3-9. Infrastructure in Pettibone Ravine affected by Erosion and Slope Failure



Section of lakefront experiencing slope failure on the bluff and beach loss.
The loss of beach is compounding the loss of the bluff.

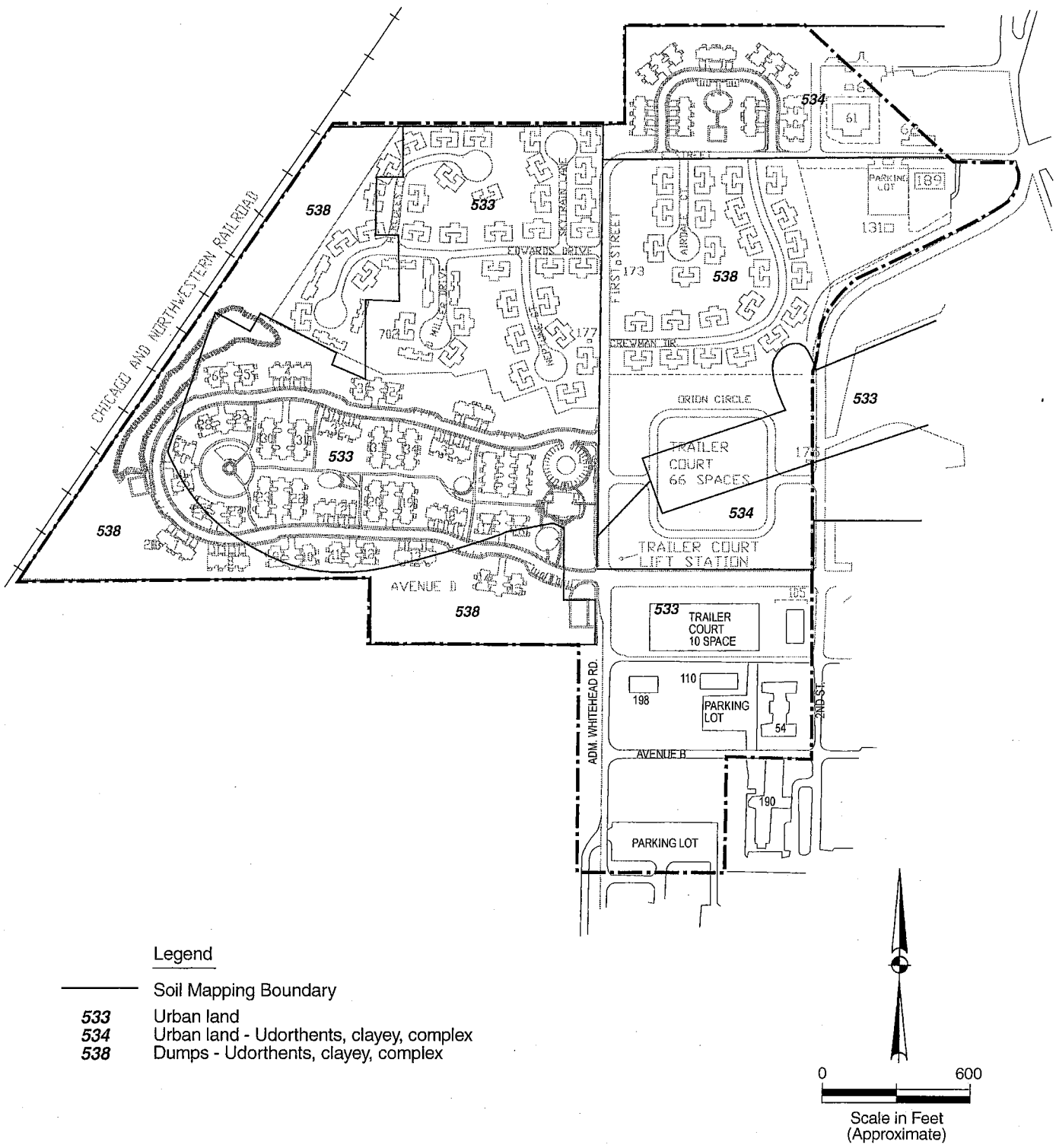
Figure 3-10. Bluff and Beach Losses occurring at the Main Installation

Photo A - Bluff toe failure on Fort Sheridan Housing Annex.

Photo B - Bluff toe failure on Fort Sheridan Housing Annex that has become revegetated.

Photo C -Pipeline exposed by bluff loss on Fort Sheridan Housing Annex. This pipeline appears to no longer be in service, but is an example of potential damage to other pipelines on the bluff.

Figure 3-11. Bluff Losses occurring at Fort Sheridan Housing Annex



Legend

———	Soil Mapping Boundary
533	Urban land
534	Urban land - Udorthents, clayey, complex
538	Dumps - Udorthents, clayey, complex

Figure 3-12. Glenview Housing Annex - Soils Map

Note: Multiply by 0.3048 to convert feet to meters.

TABLE 3-2 NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQSs)

Pollutant	Time Frame	Standard	Primary	Secondary
Ozone	1 hour	May not equal or exceed this level on more than three days over three years.	125 ppb	125 ppb
	8 hours	The average of the annual fourth-highest daily 8-hour maximum over a 3-year period is not to be at or above this level.	85 ppb	85 ppb
Carbon Monoxide	1 hour	Not to be at or above this level more than once per calendar year.	35.5 ppm	35.5 ppm
	8 hours	Not to be at or above this level more than once per calendar year.	9.5 ppm	9.5 ppm
Sulfur Dioxide	3 hours	Not to be at or above this level more than once per calendar year.	NA	550 ppb
	24 hours	Not to be at or above this level more than once per calendar year.	145 ppb	NA
	Annual	Not to be at or above this level.	35 ppb	NA
Nitrogen Dioxide	Annual	Not to be at or above this level.	54 ppb	54 ppb
PM_{10}	24 hours	The 3-year average of the annual 99th percentile for each monitor within an area is not to be at or above this level.	155 $\mu g/m^3$	155 $\mu g/m^3$
	Annual	The 3-year average of annual arithmetic mean concentrations at each monitor within an area is not to be at or above this level.	51 $\mu g/m^3$	51 $\mu g/m^3$
$PM_{2.5}$	24 hours	The 3-year average of the annual 98th percentile for each population-oriented monitor within an area is not to be at or above this level.	66 $\mu g/m^3$	66 $\mu g/m^3$
	Annual	The 3-year average of annual arithmetic mean concentrations from a single- or multiple-community-oriented monitors is not to be at or above this level.	15.1 $\mu g/m^3$	15.1 $\mu g/m^3$
Lead	Quarter	Not to be at or above this level.	1.55 $\mu g/m^3$	1.55 $\mu g/m^3$

ppb = parts per billion
ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter

New Ozone Standard

In July 1997, the U.S. Environmental Protection Agency (EPA) announced a New Ambient Air Quality Standard for ground-level ozone. The EPA is phasing out and replacing the previous one-hour standard with an eight-hour standard to protect public health against longer exposure to this air pollutant. A community will meet the eight-hour standard when the three-year average of the annual fourth-highest daily maximum eight-hour concentration measured at each monitoring site is less than 85 parts per billion.

The previous one-hour standard still applies to communities that were not in attainment of that standard on July 1997. Once these communities meet the one-hour standard, the EPA will judge them by the new eight-hour standard. The EPA will use the eight-hour standard to judge the air quality of all other communities and will announce which ones are not in attainment of the new standard in 2000. Its decision will be based upon measurements taken during the three-year period from 1997 through 1999.

Source: TNRCC, 1998

The Environmental Protection Agency (EPA) has published final rules on general conformity that apply to federal actions in areas designated *non-attainment* for any of the criteria pollutants under the Clean Air Act (CAA). A conformity determination would be required for any proposed activity anticipated to produce direct or indirect emissions in excess of established *de minimis* levels for the area (see *Section 4.1.2*).

3.1.3 Sound Environment

The area surrounding the Main Installation consists of industrial and residential areas of North Chicago to the north, Lake Michigan to the east, residential areas of Lake Bluff and unincorporated Shields Township to the south, and active rail-lines and industrial areas to the west. Active rail-lines also bisect the Main Installation. The area surrounding the FSHA consists of residential areas to the north, Lake Michigan to the east, residential areas to the south, and institutional facilities to the west. The area surrounding the GSA consists of a cemetery to the north, newly constructed residential areas to the east, residential and light industrial areas to the south, and an active rail-line and light commercial and residential areas to the west.

Sound levels from residential areas typically vary from approximately the low-50 to mid-60 decibel (dB) level, depending on the time of day and activities ongoing at the time. Sound levels of 53 to 59 dBs have been measured along the south fence line of the Main Installation adjacent to residential areas of Lake Bluff. Sound levels from commercial areas, industrial areas, and rail-lines generally range from 60 to 80 dB or more. Short-term passing train sound of 74 dB have been measured along the southern fence line at the Main Installation, with a sharp sound increase of approximately 80 dB when the train's whistle was used. Sound levels along the lakefront are typically associated with natural phenomenon such as wind and wave activity and avian wildlife. Occasional automobile and boat traffic and related human activities also can add to ambient sound levels. Daily sound levels associated with these variables can range from 60 to 70 dB, depending on the intensity and duration; however, during storm events, sound levels could increase to 75 to 80 dB or more.

3.1.4 Water Resources

Watersheds

Main Installation and Fort Sheridan Housing Annex

The Main Installation west of Green Bay Road, including the Willow Glen Golf Course, is located within the Skokie Drainage Basin, part of the Mississippi River Watershed (U.S. Navy, 1994). The western side of the Main Installation is drained by the Skokie River, also known as Skokie Ditch, which in turn drains into the Des Plaines River to the south of the Main Installation. The Main Installation east of Green Bay Road and the FSHA are within the Lake Michigan Drainage Basin. Surface waters in this drainage basin flow into Lake Michigan directly through a system of creeks, or ravines, along the edge of the lake (U.S. Navy, 1998a). The major surface water bodies of significance in the eastern portion of the Main Installation consist of Pettibone Creek and Lake Michigan.

Glenview Housing Annex

The GHA is located within the watershed of the West Fork of the Chicago River (U.S. Navy, 1994). The direction of flow from GHA is west to east through the West Fork into the Chicago River, which flows from north to south from the confluence with the West Fork. Naturally occurring streams and drainages are absent from GHA, and most of it is drained by surface runoff and a system of drainage ditches.

Floodplains

There are two types of floodplains at Great Lakes, riverine and coastal (lakefront) floodplains. Flooding of riverine areas is caused by rainstorm runoff that exceeds the natural carrying capacity of the channel. Flooding of the Lake Michigan coast areas results from excessive high tides, wave run-up from high winds, and storms (U.S. Navy, 1998a).

The majority of NTC Great Lakes is outside of the 100-year floodplain. Historically, localized flooding has occurred along Pettibone Creek and the Skokie River, in isolated upland depressional areas, and during major storm events, in the streets and building areas within the developed areas of the Main Installation. Flooding from high lake levels or storm surges outside of the beach areas at the Main Installation and FSHA are unlikely because they are 45 to 70 feet (14 to 21 m) higher in elevation than normal lake levels. The portions of FSHA located away from the beach area and the GHA are not located within a 100-year floodplain.

Surface Waters/Surface Water Quality

Main Installation

The Pettibone Creek system consists of a north and south fork that merge and flow east into Lake Michigan via the Boat Basin (*Figure 3-1*). The north branch of Pettibone Creek originates outside of the Main Installation in an urbanized area zoned for light industry and is the discharge point for storm sewers within the City of North Chicago. The south branch originates in a residential area south of the Department of Veteran's Affairs (VA) Hospital, and flows to the east and then to the north through a private golf course before entering the Main Installation site near Hospital Corps School. The construction and operation of the Boat Basin, Inner Harbor, and Outer Harbor during the 1940s at the Main Installation altered the lower reach of Pettibone Creek and a portion of Lake Michigan. Pettibone Creek was widened landward of the shoreline to create the 2.6-acre (1.1-ha) elongation of the creek's mouth, known as the Boat Basin. Silt has filled most of this area, reducing surface water depth from less than 1.0-foot (0.3-m) to about 5.0 feet (1.5 m) when Lake Michigan is at normal levels.

Pettibone Creek is considered moderately impaired with respect to designated uses, supporting aquatic life and recreational swimming (Illinois Environmental Protection Agency [IEPA], 1998). The causes of impairment include the presence of elevated concentrations of heavy metals and alterations in habitat. Sources of impairment include industrial point sources, urban runoff and storm water, channelization, atmospheric deposition of pollutants, and the presence of contaminated sediments. Results of sampling conducted in 1990 and 1993 indicated that Pettibone Creek has levels of phosphorous, copper, mercury, cadmium, lead, chemical oxygen demand, and strontium in excess of state water quality standards (IEPA, 1990 and U.S. Navy, 1993c). The 1993 study also found that concentrations of heavy metals, including copper (20,200 milligrams/kilogram [mg/kg]),

lead (5,720 mg/kg), and zinc (45,100 mg/kg), upstream of the Main Installation were substantially higher than background levels (copper-26.7 mg/kg, lead-21.9 mg/kg, zinc-75.5 mg/kg). Because semi volatile organic compounds (SVOC) and metals concentrations were higher in samples collected upstream of the Main Installation, it is likely that off-site sources have contributed to contaminated sediments in Pettibone Creek and the Boat Basin (U.S. Navy, 1993c).

During 1989 to 1992, as a part of a proposed harbor-dredging project, investigators sampled and tested sediments and water in the Boat Basin and Inner Harbor (U.S. Navy, 1993b). Sediment analyses showed moderate to high levels of polychlorinated biphenyl (PCB), semi-volatile compounds, dichloro-diphenyl-trichloroethane (DDT), arsenic, copper, lead, zinc, mercury, and ammonia nitrogen when compared to water quality standards or Lake Michigan background levels. Ambient water quality readings in the harbor and Lake Michigan showed pollutant concentrations below Illinois water quality standards, suggesting that contaminants have settled into the harbor bottom.

The Skokie River receives storm water discharges at several locations along its course within the Main Installation and typically flows year round. The Skokie River generally has fair water quality (IEPA, 1998). The 1998 update to the Illinois Water Quality Report states the overall use and aquatic life functions of the Skokie River have partial support/minor impairment. Stream channelization, storm water runoff, and point-source pollutant discharges reduce water quality and suitability of the Skokie River as fish habitat.

Fort Sheridan Housing Annex

At the FSHA, Bartlett Ravine is now a paved road that provides access to the beach (*Figure 3-2*); however, this ravine still carries water to Lake Michigan in the roadside ditches. Also, a small stream flows through Schenk's Ravine to Lake Michigan and carries water much of the year, but a third ravine is dry most of the year.

Glenview Housing Annex

There are no permanent naturally occurring water bodies on the GHA. An intermittent stream does cross the western boundary and has been routed across the former airfield to drain into the West Fork. The remaining watercourses on GHA are drainage ditches and ornamental ponds excavated as part of the housing development.

Groundwater/Groundwater Quality

Glacial deposits that are up to 300 feet (91 m) thick underlie the Main Installation. This material is poorly sorted and is a possible source of area groundwater. Sand and gravel lenses located throughout the deposited glacial till may serve as localized aquifers, while fine-grained till deposits may serve as aquitards. Groundwater is the source of potable water for Illinois communities without access to Lake Michigan surface water. Regionally, there are five water-bearing hydrogeologic units located beneath the Main Installation. These aquifers are, in order of increasing depth below surface, the Glacial Drift, the Silurian Dolomite, the Glenwood-St. Peter Sandstone, the Ironton-Galesville Sandstone, and the Mt. Simeon Sandstone. At the Main Installation, potable water is supplied from Lake Michigan (U.S. Navy, 1998a).

The water table is typically within 10 feet (3 m) of the ground surface in most parts of the Main Installation, and may intersect the surface in low-lying areas. The shallow water table intersects Pettibone Creek, and may intersect the Skokie River after periods of heavy rainfall. Groundwater movement is primarily horizontal through the till, and rates of movement are slow due to low hydraulic conductivities. With depth, pore spaces are filled with calcareous cement that isolates the overlying till from the deeper aquifers (U.S. Navy, 1998a).

3.2 BIOLIGICAL ENVIRONMENT

3.2.1 Vegetation

Pre-settlement vegetation away from the shore of Lake Michigan in Lake and Cook counties consisted of a hardwood forest of oaks, hickory, maple, and other hardwood trees (U.S. Navy, 1994). Along the shore of Lake Michigan, the plant communities consisted of mostly herbaceous plants adapted to the beaches, dunes, sandy prairies, and wetlands found between open water and the lake bluffs. Most of the native forest areas have been cleared for development with the remaining native vegetation restricted to the lake bluffs, ravine side slopes and creek bottoms.

Main Installation

The Main Installation no longer supports large areas of native vegetation outside of the edge-dominated landscape, consisting of ravines, lake bluffs, and beach areas. Vegetation in the developed areas consists of grasses, trees, and shrubs with a few scattered remnants of native vegetation. Plants found in open areas that are maintained as lawns include Kentucky bluegrass (*Poa pratensis*), Canada bluegrass (*Poa compressa*), creeping red fescue (*Festuca rubra*), tall fescue (*Festuca arundinacea*), and clover (*Meliotus* spp.). Native and introduced trees found in developed areas include cottonwood (*Populus deltoides*), white oak (*Quercus alba*), red oak (*Quercus rubra*), honey locust (*Gledistia triancanthos*), black cherry (*Prunus serotina*), red maple (*Acer rubrum*), sugar maple (*Acer saccharum*), bitternut (*Juglans cinerea*), common (*Rhamnus cathartica*) and European (*Rhamnus fragula*) buckthorn, hawthorn (*Crataegus* spp.), cranberry viburnum (*Viburnum trilobum*), Norway spruce (*Picea abies*), and blue spruce (*Picea pungens*). Two areas within the developed areas of the Main Installation retain native vegetation. An area near Main Side Brick Row east of Building 1 and extending to Hospitalside, and an area extending from east of Building 200H to south of Building 1H contain native trees and herbaceous plants. Within the ravines and on the bluffs, the vegetation consists of elm (*Ulmus* spp.), mixed oaks, sugar maple, silver maple (*Acer saccharinum*), and ash (*Fraxinus* spp.). Shrubs include blueberry (*Vaccinium* spp.), huckleberry (*Gaylussacia* spp.), blackberry (*Rubus* spp.), and immature trees of the overstory as well as willow (*Salix* spp.), red osier dogwood (*Cornus stolonifera*), sassafras (*Sassafras albidum*), and black oak (*Quercus velutina*).

Fort Sheridan Housing Annex

Like the Main Installation, FSHA is developed heavily away from the ravines, lake bluffs, and beach areas. Native vegetation is limited to the ravines, lake bluffs, and the beach areas. The diversity of native plants on FSHA is high, and remnants of unique plant communities and communities of special concern are found on the bluffs. The vegetation of the ravines and lake bluffs is hardwood forest that includes trees such as elm, oaks, sugar maple, silver maple, and ash, and shrubs such as blueberry, huckleberry, blackberry, and immature trees as well as willow, red osier dogwood, sassafras, and black oak. The ravines and lake bluffs also support a diversity of herbaceous plants.

The plants found along the beach areas are restricted to relatively stable areas, although the beach does provide habitat for some State-listed threatened or endangered species. The diversity of plants on the beach is relatively high, and predominantly herbaceous.

Glenview Housing Annex

The pre-settlement vegetation at this location was a prairie consisting of big bluestem, switch grass, and numerous prairie broadleaf plants. Little native vegetation remains on GHA. The developed areas are maintained with grasses, trees, and shrubs. English (*Ulmus procera*) and Chinese (*Ulmus parvifolia*) elms were used extensively as ornamentals, but these trees were eradicated by Dutch elm disease and not replaced. Other trees used in landscaping include Norway maple, sugar maple, silver maple, oaks, honey locust, crabapple (*Malus* spp.), hawthorn, and white ash (*Fraxinus americana*). Shrubs include red osier dogwood, nannyberry (*Viburnum lentago*), and arrowwood (*Viburnum* spp.). Grasses in the maintained areas include red fescue, tall fescue, Kentucky bluegrass, and rye grass (*Elymus* spp.).

3.2.2 Wildlife

Fishes

Historically, Lake Michigan had the highest commercial fishery yield of the oligotropic Great Lakes. The sea lamprey and alewife invasion, heavy fishing pressure, and habitat degradation drastically altered the indigenous fish community that supported the commercial fishery (U.S. Department of Interior, 1998). Resource agencies have made significant progress in fish community rehabilitation in the last 30-35 years. Regulation of chemical inputs to the lake and increased fish habitat conservation and management have improved conditions for commercial game fish such as the Coregonines (whitefish [*Coregonus clupeaformis*] and chubs [*Coregonus hoyi*]), lake trout (*Salvelinus namaycush*), and coho (*Oncorhynchus kisutch*) and chinook salmon (*Oncorhynchus tshawytscha*). In the 1980s, chubs rebounded to high abundance levels and yellow perch (*Perca flavescens*) rebounded to abundance levels that produced near record total harvest. An intensive hatchery program to develop Pacific salmon (*Oncorhynchus* spp.) and trout populations created an excellent trout and salmon sport fishery (U.S. Department of Interior, 1998).

Main Installation

During fish surveys conducted in 1983, 1984, and 1986, twenty species of fish were documented within the Main Installation Harbor (*Table 3-3*). The presence of these commercial and sport fish makes the harbor an important resource to be managed for the benefit of the lake fisheries and recreational fishing at the Main Installation.

Pettibone Creek provides potential habitat for fish, as do the Inner and Outer Harbors of the Main Installation. However, recent fauna surveys have not documented any significant fish populations within Pettibone Creek, although a few individual fish are reported well upstream from the mouth of the creek. A 1989 investigation of Pettibone Creek found low species diversity in the indigenous fish community (U.S. Navy, 1990). Creek chubs (*Semotilus atromaculatus*), fathead minnows (*Pimephales promelas*), green sunfish (*Lepomis cyanellus*), and white suckers (*Catostomus commersoni*) were the dominant species in this community. NTC Great Lakes personnel have observed salmon congregating upstream from the mouth of Pettibone Creek (U.S. Navy, 1990). The

TABLE 3-3 FISHES DOCUMENTED FROM LAKE MICHIGAN IN AND NEAR NTC GREAT LAKES HARBORS DURING SURVEYS CONDUCTED IN 1983, 1984, AND 1986

Common Name	Scientific Name
Coho Salmon	*Oncorhynchus kisutch*
Chinook Salmon	*Oncorhynchus tshawytscha*
Lake Trout	*Salvelinus namaycush*
Brown Trout	*Salmo trutta*
Rainbow Trout	*Oncorhynchus mykiss*
Carp	*Cyprinus carpio*
Carp x Goldfish	*Cyprinus carpio x Carassius auratus*
Gizzard Shad	*Dorosoma cepedianum*
Lake Whitefish	*Coregonus clupeaformis*
Alewife	*Alosa pseudoharengus*
Black Bullhead	*Ameiurus melas*
Bluntnose Shiner	*Pimephales notatus*
Golden Shiner	*Notemigonus crysoleucas*
Emerald Shiner	*Notropis atherinoides*
Rainbow Smelt	*Osmerus mordax*
Rock Bass	*Ambloplites rupestris*
White Sucker	*Catostomus commersoni*
Yellow Perch	*Perca flavescens*
Northern Pike	*Esox lucius*
White Crappie	*Pomoxis annularis*

Source: U.S. Navy, 1993c

reported salmon are most likely transient individuals not part of permanent or self-sustaining populations of salmon in the creek. The report concluded that water quality, stream size, and gradient limit the fisheries diversity. Likewise, the Skokie River, in the area of the Main Installation, does not have any reported populations of fish, and is not likely to be suitable for such populations in its current condition.

Fort Sheridan Housing Annex and Glenview Housing Annex

Except for the offshore area, FSHA does not have potential habitat for freshwater fishes. Conditions in Lake Michigan along the shore of FSHA are similar to those at the Main Installation. The stream in Schenk's Ravine is shallow and has low flow throughout the year. A nearly vertical section of the stream where the bluff and beach meet is an impassable barrier to fishes that may attempt to enter the stream from Lake Michigan. GHA does not have natural water bodies suitable as habitat for fishes.

Amphibians and Reptiles

Main Installation

Recent fauna surveys of the Main Installation have not document the presence of amphibians or reptiles within Pettibone Ravine, the bluffs, or along the beaches, although potential habitat for these species is present. Based on known distributions and vegetation types, species of amphibians and reptiles that may occur on the Main Installation include snapping turtles (*Chelydras serpentina*), musk turtle (*Sternotherus odoratus*), Eastern plains garter snake (*Thamnophis radix*), fox snake (*Elaphe vulpina*), Eastern hognose snake (*Heterodon platyrhinos*), Eastern tiger salamander (*Ambystoma tigrinum tigrinum*), Fowler's toad (*Bufo woodhousei fowleri*), Western chorus frog (*Pseudacris triseriata triseriata*), and green frog (*Rana clamitans melanota*) (U.S. Navy, 1995 and 2000a).

Fort Sheridan Housing Annex

Unlike the Main Installation, amphibians and reptiles have been documented on FSHA. Historically, the amphibians known from this area are green frogs, Western chorus frogs, Fowler's toad, and eastern tiger salamander. Reptiles inhabiting FSHA are snapping turtle, musk turtle, Eastern plains garter snake, fox snake, and Eastern hognose snake. These species are limited to the undeveloped ravines, bluffs, and beachfronts but may on occasion be found in the developed areas. American toads (*Bufo americanus*) and Chicago garter snake (*Thamnopis sirtalis semifasciata*) were documented as present on FSHA (U.S. Navy, 1995 and 2000a).

Glenview Housing Annex

Significant populations of amphibians and reptiles are absent from GHA. The highly urbanized setting of the housing area, especially in the interior portions, makes it unsuitable for most species of amphibians and reptiles. Ditches along the perimeter and in the interior of the housing area can act as habitat for amphibians where standing water is found for extended periods of time, but this habitat is of limited value because of its small size and ephemeral nature. Amphibians and reptiles that may occur on GHA are similar to those found on the Main Installation and FHSA.

Birds

Main Installation

Many species of resident and migratory birds make use of NTC Great Lakes. Recent bird surveys documented 34 species of breeding birds and 100 species of migratory birds within the Main Installation (*Table 3-4*) (U.S. Navy, 1995 and 2000a). The majority of the breeding birds are extremely common in the Chicago area, tolerant of human activities, and able to survive in the edge-dominated landscape found on the Main Installation. The highly developed nature of the Main Installation limits the number of bird species able to make use of it, with the greatest concentration and diversity of species found in Pettibone Ravine and along the lake bluffs and beach areas where human impacts are least. Some of the species listed as migratory may in fact be resident year-round on the Main Installation, but the majority appears to use the ravines, lake bluffs, and beach areas as a resting and feeding area during migrations. During June 2000, a colony of the State-listed endangered common tern (*sterna hirundo*) was documented on the Main Installation in the vicinity of the Outer Harbor. Thirteen nests were counted but failed to fledge (IDNR, 2000).

Fort Sheridan Housing Annex and Glenview Housing Annex

Twenty-three species of birds were documented as breeding birds on FSHA, and 98 as migratory (U.S. Navy, 1995 and 2000a). The majority of these species are extremely common in the Chicago area, tolerant of human activities and able to survive in the edge-dominated landscape. The small number of breeding species (23) is a reflection of the limited amount of vegetation that resembles pre-settlement plant communities in the area. No bird survey was done on GHA, but the species expected are the same as found in the more urban areas of the Main Installation and FSHA.

Mammals

Mammals found on the Main Installation and FSHA are similar because of the similarity of habitats and conditions on each site. The mammalian community is dominated by species that are adapted to edge habitats and human-impacted environments typical in the area. Mammals likely or known to occur on the Main Installation and FSHA are listed in *Table 3-5*. Because of the limited amount of available habitat, most populations of mammals, especially for the larger species listed, are small and transient on the Main Installation and FSHA. Smaller mammals, such as the gray squirrel (*Sciurus carolinensis*), Eastern chipmunk (*Tamias striatus*), and white-footed mouse (*Peromyscus leucopus*), that require less space than larger species can have relatively large populations (U.S. Navy, 1995 and 2000a).

Because of the heavily urbanized nature of the GHA and surrounding areas, the number of species and individuals of mammals likely to be found on the site is small. A survey for mammals on GHA has not been conducted. However, commensal species and those tolerant of the urbanized environment such as the house mouse (*Mus musculus*), gray squirrels, Eastern cottontail rabbits (*Sylvilagus floridanus*), and Eastern chipmunks are the most likely species to be found within GHA (U.S. Navy, 1995).

3.2.3 Threatened and Endangered Species

The USFWS lists four species of animals and four species of plants in Lake and Cook counties as threatened or endangered (USFWS, 1999). Lack of suitable habitat for most of these species and

TABLE 3-4 BREEDING AND MIGRATORY BIRDS DOCUMENTED ON THE MAIN INSTALLATION AND FORT SHERIDAN HOUSING ANNEX

Common name	Scientific name	NTC	FHSA
Gaviidae			
Common loon	*Gavia minor*		M
Podicepedidae			
Horned grebe	*Podiceps auritus*	M	M
Pied-billed grebe	*Podilymbus podiceps*	B, M	M
Phalacrocoracidae			
Double-crested cormorant	*Phalacrocorax auritus*	M	M
Ardeidae			
Great blue heron	*Ardea herodias*	M	M
Green-backed heron	*Batorides striatus*	M	M
Black-crowned night heron	*Nycticocorax nycticocorax*	B, M	
Anatidae			
Wood duck	*Aix sponsa*		M
Green-winged teal	*Anas crecca*		M
Blue-winged teal	*Anas discors*	B, M	M
Mallard	*Anas platyrhyncos*	B, M	B, M
Redheaded duck	*Atythya americana*	M	
Lesser scaup	*Aythya affinis*	B, M	M
Canada goose	*Branta Canadensis*	M	M
Bufflehead	*Bucephala albeota*	M	
Hooded merganser	*Lophodytes cucullatus*		M
Red-breasted merganser	*Mergus serrator*	M	M
Accipitridae			
Cooper's hawk	*Accipiter cooperii*		M
Bald eagle	*Haliaeetus leucocephalus*		M
Osprey	*Pandion haliaetus*		M
Falconidae			
American kestrel	*Falco sparverius*		M
Rallidae			
American coot	*Fulica americana*	M	
Sora rail	*Porzana Carolina*	M	
Charadriidae			
Spotted sandpiper	*Actitis macularia*	B, M	M
Ruddy turnstone	*Arenaria interpres*	M	
Sanderling	*Calidris alba*	M	
Dunlin	*Calidris alpina*	M	
Killdeer	*Charadrius vociferous*	B, M	B, M
Wesley snipe	*Gallinago gallinago*		M
American avocet	*Recurvirostra americana*	M	
Laridae			
Herring gull	*Larus argentatus*	M	M

B = Breeding, M = Migratory

TABLE 3-4 CONTINUED

Common name	Scientific name	NTC	FHSA
Ring-bill gull	*Larus delawarensis*	B, M	B, M
Bonaparte's gull	*Larus Philadelphia*	M	M
Franklin's gull	*Larus pipixcan*	M	M
Parasitic jaegar	*Stercorarius parasiticus*	M	
Caspian tern	*Sterna caspia*	M	M
Forster's tern	*Sterna forsteri*	B, M	M
Common tern	*Sterna hirundo*	M	
Columbidae			
Rock dove	*Columba livia*	M	B, M
Mourning dove	*Zenaida macroura*	B, M	B, M
Strigidae			
Eastern screech owl	*Otus asio*	M	
Caprimulgidae			
Common nighthawk	*Chordeiles minor*	M	
Apodidae			
Chimney swift	*Chaetura pelagrica*	B, M	B, M
Alcidinidae			
Belted kingfisher	*Ceryle alcyon*	B, M	M
Picidae			
Northern flicker	*Colaptes auratus*	B, M	B, M
Red-bellied woodpecker	*Melanerpes carolinus*	B, M	B, M
Redheaded woodpecker	*Melanerpes erythrocephalus*	M	M
Downy woodpecker	*Picoides pubescens*	B	M
Hairy woodpecker	*Picoides villosus*	M	M
Yellow bellied sapsucker	*Sphyrapicus varius*	M	
Tyranidae			
Eastern wood-pewee	*Contopus virens*	M	M
Least flycatcher	*Empidonax minimus*		M
Willow flycatcher	*Empidonax traillii*	M	M
Acadian flycatcher	*Empidonax virescens*	M	M
Eastern phoebe	*Sayornis phoebe*		M
Eastern kingbird	*Tyranus tyranus*	M	M
Hirundinidae			
Cliff swallow	*Hirundo pyrrhonota*	M	M
Barn swallow	*Hirundo rustica*	B, M	B, M
Bank swallow	*Riparia riparia*	M	M
Tree swallow	*Tachycinceta bicolor*	M	M
Bombicilidae			
Cedar waxwing	*Bombycilla cedrorum*	M	M
Troglodytidae			
House wren	*Troglodytes aedon*	B, M	M
Mimidae			
Gray catbird	*Dumetella carolinensis*	B, M	B, M
Northern mockingbird	*Mimus polyglottus*		M

B = Breeding, M = Migratory

TABLE 3-4 CONTINUED

Common name	Scientific name	NTC	FHSA
Brown thrasher	*Toxostoma rufum*	M	B, M
Turdidae			
Veery	*Catharus fuscescens*	M	M
Hermit thrush	*Catharus guttatus*	M	M
Wood thrush	*Hylocichla mustelina*		M
Blue-gray gnatcatcher	*Polioptila caerula*		M
Ruby crowned kinglet	*Regulus calendula*		M
Golden crowned kinglet	*Regulus satropa*	M	M
American robin	*Turdus migratorius*	B, M	B, M
Paridae			
Black-capped chickadee	*Parus atricapillus*	B, M	B, M
Sittidae			
White-breasted nuthatch	*Sitta carolinensis*	B, M	M
Certhiidae			
Brown creeper	*Certhia americana*	M	M
Emberizidae			
Northern cardinal	*Cardinalis cardinalis*	B, M	B, M
Dark-eyed junco	*Junco hyemalis*	M	
Swamp sparrow	*Melospiza georgiana*	M	M
Song sparrow	*Melospiza melodia*	B, M	M
Indigo bunting	*Passerina cyanea*	B, M	
Rose-breasted grosbeak	*Pheucticus ludovicianus*	M	M
Rufus-sided towhee	*Pipilo erythrophthalmus*	M	M
Scarlet tanager	*Piranga olivacea*		M
Chipping sparrow	*Spizella pallida*	M	M
White-throated sparrow	*Zonotrichia albicollis*	M	M
White crowned sparrow	*Zonotrichia leucophrys*		M
Parulidae			
Bay-breasted warbler	*Dendroica castanea*		M
Cerulean warbler	*Dendroica cerulea*	M	
Yellow rumped warbler	*Dendroica coronata*	M	M
Prairie warbler	*Dendroica discolor*	M	M
Blackburnian warbler	*Dendroica fusca*	M	M
Magnolia warbler	*Dendroica magnolia*	M	M
Palm warbler	*Dendroica palmarum*		M
Chestnut-sided warbler	*Dendroica pensylvanica*	M	M
Blackpoll warbler	*Dendroica striata*	M	M
Cape May warbler	*Dendroica tigrina*		M
Kentucky warbler	*Geothlypis formosa*	M	
Common yellowthroat	*Geothlypis trichas*	B, M	
Black and white warbler	*Mniotitla varia*	M	M
Ovenbird	*Seiurus aurocapillus*		M
American redstart	*Setophaga ruticilla*	M	M
Tennessee warbler	*Vermivora peregrina*	M	

B = Breeding, M = Migratory

TABLE 3-4 CONTINUED

Common name	Scientific name	NTC	FHSA
Blue winged warbler	*Vermivora pinus*		M
Canada warbler	*Wilsonia Canadensis*		M
Wilson's warbler	*Wilsonia pusilla*	M	M
Vireonidae			
Yellow throated vireo	*Vireo flavifrons*	M	
Warbling vireo	*Vireo gilvus*	M	M
Icteridae			
Redwinged blackbird	*Agelaius phoeniceus*	B, M	B, M
Northern oriole	*Icterus galbula*	B, M	B, M
Brownheaded cowbird	*Molothrus ater*	B, M	B, M
Common Grackle	*Quiscalus quiscula*	B, M	B, M
Eastern meadowlark	*Sturnella magna*	M	M
Fringillidae			
American Goldfinch	*Carduelis tristis*	B, M	B, M
Purple finch	*Carpodacus purpureus*		M
Ploceidae			
House sparrow	*Passer domesticus*	B, M	B, M
Sturnidae			
European starling	*Sturnus vulgaris*	B, M	B, M
Corvidae			
American crow	*Corvus brachyrhyncus*	B, M	B, M
Northern raven	*Corvus corax*	M	M
Bluejay	*Cyanocritta cristata*	B, M	B, M

Source: U.S. Navy, 2000a; 1995

B = Breeding, M = Migratory

TABLE 3-5 LIST OF MAMMALS THAT ARE OR MAY BE FOUND ON THE MAIN INSTALLATION, FORT SHERIDAN HOUSING ANNEX, AND GLENVIEW HOUSING ANNEX

Common Name	Scientific Name
Bat (species undetermined)	
Coyote	*Canis latrans*
Opossum	*Didelphis virginiana*
Woodchuck	*Marmota monax*
Striped skunk	*Mephitis mephitis*
Meadow vole	*Microtus pennsylvanicus*
House mouse	*Mus musculus*
White-tailed deer	*Odocoileus virginianus*
Cotton mouse	*Peromyscus gossypinus*
White-footed mouse	*Peromyscus leucopus*
Deer mouse	*Peromyscus maniculatus*
Raccoon	*Procyon lotor*
Gray squirrrel	*Sciurus carolinensis*
Eastern cottontail	*Sylvilagus floridanus*
Eastern chipmunk	*Tamias striatus*
Redd foxx	*Vulpes vulpes*

Note: These species are known to inhabit the Main Installation, FSHA, and GHA. Reference to a species is not an indication of problems created by the species, or an indication of specific management guidelines needed or in place.

Source: U.S. Navy, 2000a; 1995

urbanization surrounding the Main Installation, FSHA, and GHA greatly reduces the possibility of finding any Federal-listed threatened or endangered species on these locations. A county-by-county listing of Federal-listed threatened and endangered species in Illinois is available at *http://www.fws.gov/r3pao/eco_serv/endangrd/index.html*. The Illinois Endangered Species Protection Board (IESPB) listed 299 species of plants as endangered and 58 as threatened in Illinois. In addition, 21 species of fish are listed as endangered and nine species as threatened. Nine species of amphibians and reptiles are listed as endangered, with the same number listed as threatened. Thirty-two species of birds are listed as endangered and nine species are listed as threatened. Six species of mammals are listed as endangered, and three are listed as threatened. The latest lists of State-listed threatened and endangered species can be found on the World Wide Web at *http://www.inhs.uiuc.edu/cbd/main/TnE/* and *http:/dnr.state.il.us/espb/*.

Terrestrial Species

Plants

Three species of plants, the Eastern prairie fringed orchid (*Platanthera leucophaea*), prairie bush-clover (*Lespedeza leptostachya*), and Pitcher's thistle (*Cirsium pitcheri*), are Federal-listed as threatened in Lake and Cook counties (USFWS, 1999). None of these species were documented in a recent floral survey of the Main Installation and FSHA. The eastern prairie fringed orchid requires mesic to wet prairies, and the prairie bush-clover requires dry to mesic prairies with gravelly soils, conditions that do not exist on the Main Installation or FSHA. Potentially suitable conditions for Pitcher's thistle (lakeshore dunes) do exist on the Main Installation and FSHA, however, and this plant eventually may colonize the dunes on either location. This species has been introduced to Lake County (USFWS, 1999).

The 1995 floral survey found five species of plants on the state threatened and endangered species lists within the Main Installation and seven threatened and endangered species on FSHA (*Table 3-6*). Most of these species were found on the lake bluffs and the panne community along the shore of Lake Michigan. Forked aster was found only in Pettibone Ravine at the Main Installation, and black-seeded rice grass only in Bartlett Ravine at FSHA, during the floral survey. A lone white cedar tree was found on the lake bluff of FSHA, but this tree was not expected to survive because of slope erosion occurring around the tree.

Invertebrates

The USFWS currently lists the Karner blue butterfly (*Lycaeides melissa samuelis*) as extirpated in Lake County (USFWS, 1999), but also states that the potential for this butterfly to inhabit the county remains. The loss of oak savannahs and pine barrens to urbanization, and suppression of naturally occurring fires in Lake County is the main reason for the loss of the Karner blue butterfly within Lake County. Because the Main Installation and FSHA lack these types of plant communities, the presence of the Karner blue butterfly is unlikely. In Cook County, the Hine's emerald dragonfly (*Somatochlora hineana*) is Federal-listed as endangered (USFWS, 1999). This insect inhabits calcareous marshes overlaying dolomite bedrock. This type of marsh is not found on GHA, and the presence of the Hine's emerald dragonfly is highly unlikely.

No comprehensive survey for invertebrates has been conducted on the Main Installation, FSHA, and GHA recently, and the presence of any of the State-listed species on NTC Great Lakes is unknown.

TABLE 3-6 STATE-LISTED THREATENED OR ENDANGERED PLANTS DOCUMENTED TO OCCUR ON THE MAIN INSTALLATION AND FORT SHERIDAN HOUSING ANNEX

Common name	Scientific name	Status*	NTC*	FSHA*
Marram grass	*Ammophila breviligulata*	E	X	
Golden sedge	*Carex aurea*	E, PFE		X
Buffalo berry	*Sheperdia canadensis*	E		X
Sea rocket	*Cakile edentula*	T	X	X
Seaside spurge	*Chamaesyce polygonifolia*	E	X	X
Forked aster	*Aster furcatus*	T	X	
Green yellow sedge	*Carex viridula*	E	X	
Common juniper	*Juniperus communis*	T		X
Black-seeded rice grass	*Oryzopsis racemosa*	T		X
White cedar	*Thuja occidentalis*	T		X

*T = threatened, E = endangered, PFE = Proposed Federal Endangered, X = present at this location

Source: U.S. Navy, 1995

Herpetofauna

No species of reptiles or amphibians within Lake and Cook counties are Federal-listed as threatened or endangered (USFWS, 1999). Because no amphibians or reptiles were documented on the Main Installation during recent faunal surveys, the likelihood that any State-listed threatened or endangered species will be found is very small. None of the herptiles documented on FHSA are Federal or State-listed as threatened or endangered.

Birds

No Federal-listed threatened or endangered species of bird are known from Cook or Lake counties. The piping plover (*Charadrius melodus*) and bald eagle (*Haliaeetus leucocephalus*) are potential transient migrants along the shores of Lake Michigan (U.S. Navy, 1998a), though none is likely to nest on the Main Installation or FSHA. The piping plover prefers nesting on undisturbed sandy beaches in proximity to water bodies. The closest proposed habitat for the piping plover is located north of the Main Installation, north of the Waukegan Beach breakwall. Beaches on The Main Installation and FSHA are easily accessible to foot traffic, which creates a relatively low but constant level of disturbance. This disturbance makes the beaches unsuitable as nesting habitat for piping plovers. The areas on and surrounding The Main Installation and FSHA are too urbanized and lack sufficient nesting trees for the bald eagle.

The Main Installation and FSHA are used as feeding and resting sites by migrant birds and are important to the conservation of State-listed threatened and endangered species. Five species identified during a breeding bird survey of the Main Installation and FSHA are State-listed as endangered, and five as threatened (*Table 3-7*) (U.S. Navy, 1995). The investigator conducting the bird survey classified them as migrants, not breeding birds. The investigator believed that these species were using the Main Installation as a feeding and loafing site during migration or while nesting somewhere off-site.

A nesting colony of common terns (*Sterna hirunda*) was documented on the Main Installation during the summer of 2000 (IDNR, 2000). This colony appeared to be a colony that was displaced from a location north of the Main Installation. The colony did not successfully breed during the summer of 2000; however, apparently because human activities on the beach frequently flushed the birds, leaving the nests exposed to predation and causing stress in the nesting pairs.

Mammals

The Indiana bat (*Myotis sodalis*) is considered to be endangered in all counties of Illinois (USFWS, 1999), and is the only Federal-listed threatened or endangered species of mammal in Lake and Cook counties. The normal hibernation habitat (caves and abandoned mines) is not found on the Main Installation, FSHA, and GHA. This bat requires riparian and floodplain forests to form successful maternity colonies and as foraging habitat. Because this type of habitat is not found on NTC Great Lakes, the presence of this bat is highly unlikely.

The most recent faunal survey did not document the presence of any State-listed threatened or endangered mammals on the Main Installation and FSHA (U.S. Navy 1995 and 2000a). Their presence on NTC Great Lakes is unlikely because of the high degree of urbanization of these areas and limited amount of available habitat.

TABLE 3-7 STATE-LISTED THREATENED OR ENDANGERED ANIMAL SPECIES DOCUMENTED TO OCCUR ON THE MAIN INSTALLATION AND FORT SHERIDAN HOUSING ANNEX

Common name	Scientific name	Status*	NTC	FSHA
Pied-billed grebe	*Podilymbus podiceps*	T	X	X
Double-crested cormorant	*Phalacrocorax auritus*	T	X	X
Black-crowned night heron	*Nycticocorax nycticocorax*	E	X	
Cooper's hawk	*Accipiter cooperii*	T		X
Bald eagle	*Haliaeetus leucocephalus*	E, FT		X
Osprey	*Pandion haliaetus*	E		X
Common snipe	*Gallinago gallinago*	WL		X
Forster's tern	*Sterna forsteri*	E	X	X
Common tern	*Sterna hirundo*	E	X	
Least flycatcher	*Empidonax minimus*	WL		X
Wood thrush	*Hylocichla mustelina*	WL		X
Veery	*Catharus fuscescens*	T	X	X
Brown creeper	*Certhia americana*	T	X	X
Ovenbird	*Seiurus aurocapillus*	WL		X
Cerulean warbler	*Dendroica cerulea*	WL	X	

*T = State listed threatened, E = State listed endangered, FT = Federal listed threatened, WL = State watch list.

Note: No species of mammal, fish, reptile, amphibian, or invertebrate documented on Main Installation, FSHA, or GHA are on the state threatened or endangered species lists. However, this does not mean that state-listed species cannot occur, or that undocumented individuals of a state-listed species do not occur, on NTC Great Lakes.

Source: U.S. Navy, 1995.

Aquatic Species

The pallid sturgeon (*Scaphirhyncus albus*) is the only Federal-listed endangered species of fish in Illinois (USFWS, 1999). This fish is an inhabitant of large river systems with silty bottoms and having a diversity of depths and velocities formed by braided channels, sand bars, sand flats, and gravel bars. These conditions do not exist on the Main Installation, FSHA, or GHA. Seventeen species of fish are State-listed as endangered, and eight as threatened, within Illinois. Pettibone Creek in its current condition is unsuitable for permanent or self-sustaining populations of fish, and the presence of any of these species in this stream is unlikely. Some of these species may occur in Skokie River, but none were documented on the Main Installation during the 1995 faunal survey.

3.2.4 Wetlands

Main Installation

A wetlands delineation was performed on the Main Installation, excluding Willow Glen Golf Course, in September 1999 (US Navy, 1999a). Five wetland areas, containing 13.972 acres (5.654 ha), were found within the Main Installation. The largest of these wetland areas consists of 12.3 acres (5.0 ha) of emergent wetlands located within the outer harbor shoreline and jetty at the lakefront. The next largest area consists of 1.25 acres (0.51 ha) of emergent and scrub/shrub wetlands, a panne community, found along the shore of Lake Michigan along the North Jetty of the Outer Harbor. The remaining three wetlands, ranging from 0.012 to 0.27 acre (0.005 to 0.11 ha), were found scattered within the interior of the Main Installation. The Chicago District, U.S. Army Corps of Engineers (USACE) verified this delineation in March 2000. Additionally, approximately 5.3 acres (2.1 ha) of wetlands were delineated on Willow Glen Golf Course in 1996 (US Navy, 1996); however, some of these wetlands have received minor changes to their boundaries since that delineation, making the estimate of 5.3 acres (2.1 ha) dated.

Fort Sheridan Housing Annex

Three large wetlands have been identified along the shore of Lake Michigan at FSHA (U.S Navy, 1995), but no wetlands have been identified within the inland areas of the Navy housing areas.

Glenview Housing Annex

No wetlands are located within the GHA.

3.3 SOCIOECONOMIC ENVIRONMENT

3.3.1 Community Setting and Land Use

Land uses on NTC Great Lakes are in four general categories:

- **Improved grounds** are those areas in which development and maintenance mainly are conducted to obtain a pleasing appearance. Improved grounds include all manicured lawns, recreational fields, picnic areas, and areas kept mowed for reasons of security.

- **Semi-improved grounds** are those areas on which development and maintenance are to provide erosion resistant vegetative cover, control weeds on the installation, and reduce fire hazards by removing excess dead vegetation.
- **Unimproved grounds** are areas that do not receive maintenance or development activities. These areas usually remain in their "natural" state and may be used for wildlife management activities such as habitat improvements not traditionally considered to be grounds maintenance.
- **Other** includes areas occupied by buildings, parking areas, roads, and other hard surfaces that prevent growth of vegetation. This use includes hard structures on the waterfront.

The distribution of land uses for the Main Installation, FSHA, and GHA follows:

Location	Land Area in Acres (Hectares)				Total Area
	Improved	Semi-improved	Unimproved	Other	
The Main Installation	467 (189)	51 (21)	489 (198)	641 (259)	1,648 (667)
GHA	25 (10)	9 (4)	32 (13)	19 (8)	85 (34)
FSHA	51 (21)	21 (8)	62 (25)	72 (29)	206 (83)
Total	543 (220)	81 (33)	583 (236)	732 (296)	1,939 (785)

Grounds maintenance contractors or installation personnel conduct the grounds maintenance activities on the improved, semi-improved, and other grounds. Landscape plans for new buildings and renovations around existing buildings are designed and reviewed to provide optimum aesthetic appeal and minimum maintenance costs (U.S. Navy, 2001a).

Main Installation

The Main Installation is located in Lake County, within the City of North Chicago, approximately 35 miles (56 km) north of the business center of the City of Chicago. The municipalities located adjacent to Main Installation are the City of North Chicago to the north, the Village of Lake Bluff to the south, and unincorporated areas of Shields Township to the south and west, including two Arden Shores subdivisions. Lake Michigan shapes the eastern boundary of the Main Installation (*Figures 1-1* and *1-2*). Land use surrounding the main installation consists of residential and light industrial to the north; recreational, residential, public, and undeveloped to the south; and industrial to the west.

Fort Sheridan Housing Annex

FSHA is located in Lake County, within the City of Highland Park (*Figures 1-1* and *1-4*). Land use surrounding FSHA consists of residential to the north and south and public/institutional to the west.

Glenview Housing Annex

GHA is located in Cook County, within the Village of Glenview (*Figures 1-1* and *1-3*). Land use surrounding GHA consists of residential to the northwest, public (cemetery) to the north, residential to the east, residential and commercial/light industrial to the south, and undeveloped and commercial/light industrial to the west.

3.3.2 Population and Demographics

Main Installation and Fort Sheridan Housing Annex

The population of Lake County was 516,418 in 1990 and grew to an estimated 617,975 in 1999. The population of the City of North Chicago was 34,978 in 1990 and grew to an estimated 36,097 in 1999. The population of the City of Highland Park was 30,575 in 1990 and grew to an estimated 31,343 in 1999 (U.S. Bureau of the Census, 1990 and 2000a). The racial/ethnic distribution of the population of Lake County, North Chicago, and Highland Park is presented in *Table 3-8*. There are approximately 25,140 personnel stationed at NTC Great Lakes (U.S. Navy, 2000b).

Glenview Housing Annex

The population of Cook County was 5,105,067 in 1990 and grew to an estimated 5,192,326 in 1999. The population of the Village of Glenview was 37,093 in 1990 and grew to an estimated 41,208 in 1999 (U.S. Bureau of the Census, 1990 and 2000a). The racial/ethnic distribution of the population of Cook County and Glenview is presented in *Table 3-8*.

3.3.3 Economic Activity

As of November 2000, the labor forces in Lake County and Cook County total approximately 333,689 and 2,743,400 million, respectively, with an unemployment rate of 3.2 percent and 4.4 percent, respectively (Illinois Department of Employment Security, 2000). The 1997 median household incomes in Lake County and Cook County were approximately $63,354 and $40,181, respectively (U.S. Bureau of the Census, 2000b). Approximately 5.2 percent and 14.2 percent of the populations in Lake County and Cook County, respectively, live below the national poverty level (Missouri State Census Data Center [MSCDC], 1999) (*Table 3-8*).

NTC Great Lakes plays an important part in the economy of the region through military and civilian payroll, and associated retail sales and sales tax, property tax revenues, state income tax revenues, construction expenditures, and visitor-generated revenues. The total annual economic benefit to Lake County from NTC Great Lakes from salaries, contracts, and purchases is estimated at $391.7 million (U.S. Navy, 1999b). Estimated annual tax revenues, including sales tax, state income tax, and property taxes are $21.1 million (U.S. Navy, 1993a and 1994).

3.3.4 Environmental Justice

Executive Order 12898

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, mandates that federal agencies identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of the programs on minority and low-income populations. A minority population is defined as a group of people and/or a community experiencing common conditions of exposure or impact that consists of persons classified by the U.S. Bureau of the Census as Negro/Black/African-American; Hispanic; Asian or Pacific Islander; American Indian, Eskimo, or Aleut; or other non-white persons. A low-income population is defined as a group of people and/or a community that, as a whole, live below the national poverty level. The average poverty level threshold for a family of four people in 1989 was a total annual household income of $12,674 (U.S. Department of Commerce, Bureau of the

TABLE 3-8 POPULATION AND DEMOGRAPHICS

Geographic Area[1]	1990 Population[2]	Race/Ethnicity[2]						% Minority	% Living Below Poverty in 1989[3]
		White	Black	American Indian/ Eskimo/ Aleut	Asian/ Pacific Islander	Other	Hispanic Origin		
Lake County									
Total	516,418	431,976	34,080	1,241	12,038	348	36,735	16.4%	5.2%
% of Total	100.0%	83.6%	6.6%	0.2%	2.3%	0.1%	7.1%	16.4%	5.2%
Cook County									
Total	5,105,067	2,928,290	1,302,746	8,541	183,011	4,530	677,949	42.6%	14.2%
% of Total	100.0%	57.4%	25.5%	0.2%	3.6%	0.1%	13.3%	42.6%	14.2%
City of North Chicago									
Total	34,978	18,517	11,679	164	1,236	105	3,277	47.1%	14.9%
% of Total	100.0%	52.9%	33.4%	0.5%	3.5%	0.3%	9.4%	47.1%	14.9%
City of Highland Park									
Total	30,575	27,853	669	8	763	8	1,274	8.9%	2.8%
% of Total	100.0%	91.1%	2.2%	0.0%	2.5%	0.0%	4.2%	8.9%	2.8%
Village of Glenview									
Total	37,093	33,326	233	38	2,584	0	912	10.2%	1.7%
% of Total	100.0%	89.8%	0.6%	0.1%	7.0%	0.0%	2.5%	10.2%	1.7%
Main Installation Block Groups									
8630.00:9*	22,231	15,845	3,767	169	1,072	53	1,325	28.7%	8.8%
8631.00:1	970	272	652	0	6	0	40	72.0%	18.6%
8631.00:2	1,146	161	861	0	103	0	21	86.0%	14.6%
8631.00:3	427	61	347	19	0	0	0	85.7%	7.3%
8632.01:1	757	35	645	0	8	0	69	95.4%	16.6%
8632.01:2	789	97	600	0	0	0	92	87.7%	3.5%
8632.01:4	287	206	32	0	49	0	0	28.2%	0.0%
8632.02:9	2,969	2,869	0	0	92	0	8	3.4%	2.9%
8633.00:9	173	162	11	0	0	0	0	6.4%	14.2%
FSHA Block Groups									
8651.00:9*	2,405	1,666	495	3	118	0	123	30.7%	3.4%
8655.00:1	2,172	1,327	143	0	57	0	645	35.1%	14.8%
GHA Block Groups									
8016.08:4	2,359	1,794	0	0	442	0	123	24.0%	0.8%
8020.01:8	2,219	1,477	31	0	311	0	400	33.4%	10.2%
8020.02:1	936	792	5	0	133	0	6	15.4%	4.7%
8023.00:9*	1,997	1,636	182	23	101	0	55	15.3%	4.6%

*The Main Installation, FSHA, and GHA are located within 1990 Census Block Groups 8630.00:9, 8651.00:9, and 8023.00:9, respectively.

Source: [1]Wessex, Inc., 1994
[2]U.S. Bureau of the Census, 1990
[3]MSCDC, 1999

Census, 2000), while it is $17,050 in 2000 (65 *Federal Register* 7555-7557, February 15, 2000). Disproportionate environmental impact occurs when the risk or rate for a minority population or low-income population from exposure to an environmental hazard exceeds the risk or rate of the general population and, where available, to another appropriate comparison group (DoD, 1995 and EPA, 1998). The potential effects of the proposed action have been evaluated in accordance with the requirements of the Executive Order, and are documented in *Section 4.3.4*.

The Main Installation, FSHA, and GHA are located in Census Block Groups 8630.00:9, 8651.00:9, and 8023.00:9, respectively (Wessex, Inc., 1994). Block Groups located adjacent to the Main Installation, FSHA, and GHA are listed in *Table 3-8*.

Executive Order 13045

Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, mandates that federal agencies identify and assess environmental health and safety risks that may disproportionately affect children as a result of the implementation of federal policies, programs, activities, and standards (62 *Federal Register* 19883-19888, April 23, 1997). The closest public schools to the Main Installation include Forrestal Elementary and South Elementary Schools and Yeager Pre-Kindergarten. Forrestal Elementary School is located within the Main Installation in the Forrestal housing area (*Figure 1-2*). The closest public schools to FSHA include Wayne Thomas Elementary, Northwood Junior High, and Oak Terrace Elementary Schools (*Figure 1-4*). The closest public schools to GHA include Glenbrook High, Westbrook Elementary, and Willowbrook Elementary Schools (*Figure 1-3*).

3.3.5 Housing

The median price of a three-bedroom, single-family home in North Chicago, Highland Park, and Glenview during the fourth quarter of 2000 was $110,000; $323,500; and $280,000, respectively (Multiple Listing Service of Northern Illinois, Inc., undated). The median monthly rents in Lake County and Cook County were $558 and $478, respectively, in 1990. The housing vacancy rate in Lake County and Cook County is approximately five percent and seven percent, respectively, based on the 1990 Census (MSCDC, 1999).

Family housing assets at NTC Great Lakes total 2,796 housing units, including family housing at the Main Installation, FSHA, and GHA, and 148 mobile home spaces (U.S. Navy, 2001b). There are four types of housing at the Main Installation, including family housing, Bachelor Enlisted Quarters (BEQ) and Bachelor Officer Quarters (BOQ), student housing for Service School Command and Hospital Corps School, and open-bay barracks for recruits (U.S. Navy, 1994). Family housing areas at the Main Installation include Forrestal Village, Halsey Village, Nimitz Village, Mainside, and Hospitalside (U.S. Navy, 2001b). There are 14 recruit barracks located in Camp Porter, and a fifteenth in-processing barracks located in Camp Moffett (U.S. Navy, 2000b). There are 1,385 BEQ spaces and 169 BOQ spaces at the Main Installation. There are 329 and 409 family housing units located at FSHA and GHA, respectively (U.S. Navy, 2001b).

3.3.6 Education

Children of military personnel residing in family housing at the Main Installation attend public schools within North Chicago School District 187 (U.S. Navy, 2000b). Children of military personnel residing in family housing at FSHA attend public schools within Highland Park Districts

112 and 113 and children of military personnel residing in family housing at GHA attend public schools within Glenview District 34 and Northfield Township District 225 (U.S. Navy, 1994). The locations of the closest public schools is discussed in *Section 3.3.4*.

3.3.7 Police and Fire Protection

Police Protection

The Great Lakes Police Department (GLPD) and military guards provide police protection and security services at the Main Installation. The GLPD has exclusive overall jurisdiction for the security of the Main Installation, with military guards providing security at all gates. The GLPD and the City of North Chicago have a mutual understanding agreement that provides for courtesy assistance between the two jurisdictions. All crimes committed on the federal property at Main Installation are subject to federal prosecution (the Federal Magistrate or U.S. District Court for civilian offenses, or military courts-martial for military personnel), and/or are subject to state prosecution by the Lake County States Attorney (U.S. Navy, 2000b).

There is a police force provided by NTC Great Lakes on-site at FSHA (U.S. Navy, 2001c). The Village of Glenview provides police protection services to GHA (U.S. Navy, 2001d).

Fire Protection

Fire protection at the Main Installation is provided by the Great Lakes Fire Department, which is staffed by full-time federal civilian personnel. The Main Installation is located in Quadrant IV under the Mutual Aid Box Alarm System (MABAS). The MABAS enables local jurisdictions to assist one another in case of extreme fire events. Emergency medical services at the Main Installation are provided by the Naval Hospital located at the Main Installation (U.S. Navy, 2000b).

There is a fire department and ambulance provided by NTC Great Lakes on-site at FSHA (U.S. Navy, 2001c). The Village of Glenview provides fire protection and emergency medical services to GHA (U.S. Navy, 2001d).

3.3.8 Utilities

Main Installation

The primary public services supplied to the Main Installation consist of water, sanitary sewage, electricity, steam, natural gas, stormwater, solid waste collection, and telephone service. These services are provided either by the Main Installation or by off-site suppliers.

Potable Water Supply

The potable water system is operated by and maintained by the NTC Public Works Center (PWC), Great Lakes. The system includes a raw-water intake in Lake Michigan, a water treatment plant, storage tanks, booster pumps, and distribution water mains. Treated water is piped throughout the complex through 16-, 10-, 8-, and 6-inch (41-, 25-, 20-, and 15-cm) lines.

NTC also maintains reciprocal agreements with adjacent municipalities to obtain emergency water. The agreement with the City of Waukegan is for a maximum of 2.0 million gallons per day

(7.6 million liters per day), while the agreement with the City of North Chicago is for 2.88 million gallons per day (10.90 million liters per day).

Sanitary Sewage

The sanitary sewer system serving both NTC and the VA Hospital Complex is operated and maintained by the PWC Great Lakes. The collection system consists of a network of pipes, a pumping station, and retention facilities. The system discharges sewage to the North Shore Sanitary District plant at Gurnee, Illinois. NTC may discharge up to 10.5 million gallons per day (39.7 million liters per day) to the district for treatment. Average discharges range from 4.5 to 4.7 million gallons per day (17 to 17.8 million liters per day), with a recorded peak flow of 6.5 million gallons per day (24.6 million liters per day).

Electrical

NTC purchases approximately 92 percent of its electrical power from Commonwealth Edison Company. The other 8 percent of power is provided by steam turbines in Building 11 at the NTC. Current NTC peak usage is about 30 megawatts per day in the summer with about 20 megawatts per day the rest of the year. The system is rated at 37 megawatts. Annual electrical demand has been constant for FY 1998 and 1999 at 144,792 megawatt-hours (MWH) and 144,881 MWH, respectively.

Steam

Steam is produced at the central production plant in Building 11 at the NTC. The plant is fueled by natural gas, with fuel oil as an alternate fuel source. The system capacity is rated at 750,000 pounds per hour (lb/hr) (340,200 kilograms per hour [kg/hr]). The highest recorded level of peak demand has been 520,000 lb/hr (235,872 kg/hr). The normal peak demand ranges from 350,000 to 400,000 lb/hr (158,757 to 181,437 kg/hr) (U.S. Navy, 2000c). The plant supplies NTC and the VA Hospital through a system of six primary steam lines. Two 20-inch (51-cm) lines, each carrying steam at 125 pounds per square inch (psi) [861.85 kilopascal], supply the Naval Hospital Complex, Camp Moffett, Camp Porter, and the VA Hospital.

Natural Gas

Natural gas is purchased by NTC from the North Shore Gas Company, a major provider in the Chicago metropolitan area. North Shore Gas Company owns and maintains all of the gas distribution system at NTC. Consumption during FY 1999 at NTC was 321 million British Thermal Units (BTUs) (U.S. Navy, 2000d).

Solid Waste

Solid waste at NTC is disposed in trash containers, picked up weekly, and transported for disposal to nearby landfills in Zion (Browning Ferris Industries [BFI]) and Grayslake (Countryside). Annually, 11,067 tons (10,040 metric tons) of solid waste are transported to the landfills, and 2,100 tons (1,905 metric tons) are recycled. The BFI landfill has sufficient capacity for 20 years, and Countryside has capacity for 21 years (U.S. Navy, 1999c).

Telephone and Communications

Ameritech provides telephone service to the NTC, including phone lines to the installation and within the installation. On NTC, there is an existing, installation-owned, network of telephone conduits located throughout the NTC that connects all buildings. Ameritech runs its phone lines through these installation-owned conduits to provide service throughout the installation (U.S. Navy, 2000e).

Fort Sheridan Housing Annex

The primary services supplied to FSHA consist of water, sanitary sewage, electricity, natural gas, solid waste collection, and telephone service. The local municipality and service suppliers provide these services.

Potable Water Supply

The City of Highland Park supplies potable water to FSHA, with the current annual water usage being 44.65 million gallons (169.01 million liters). The water supply contract allows for a maximum of 2,900 gallons (10,977 liters) per minute (U.S. Navy, 2001e and f).

Sanitary Sewage

The sanitary sewer system is operated and maintained by the City of Highland Park. Current annual discharge is 36.37 million gallons (137.67 million liters). Contracted sewage capacity is 0.5 to 0.6 million gallons (1.89 to 2.27 million liters) per day (U.S. Navy, 2001e and f).

Electrical

Fort Sheridan Housing Annex purchases all of it electrical power from Commonwealth Edison Company. The incoming electrical transformer is rated at 3,000 KVA. Annual electrical demand has been 398 megawatt-hours (U.S. Navy, 2001e and f).

Steam

There is no steam used at FSHA (U.S. Navy, 2001e and f).

Natural Gas

Natural gas is purchased from Northern Illinois Gas Company. Consumption during FY 2000 was 27,357 British Thermal Units (U.S. Navy, 2001e and f).

Solid Waste

Browning Ferris Industries provides solid waste disposal service at FSHA (U.S. Navy, 2001e and f).

Telephone and Communications

Ameritech provides telephone service to FSHA (U.S. Navy, 2001e and f).

Glenview Housing Annex

At GHA, the City of Glenview provides residents with water and sewer. The same private companies that serve FSHA provide electrical, natural gas, telephone and solid waste services to GHA (BHR, 1998; and TC&B, 1999).

3.3.9 Recreation

Main Installation

Recreational facilities, activities, and services available at the Main Installation include four gymnasiums, a golf course, a bowling alley, a library, an automotive skills center, three swimming pools, a beach on Lake Michigan, three Family Activities Centers, four child development centers, the Young Adult Program, a travel agency, a marina, a gear rental shop, a picnic area, a night club, a video game room, the Petty Officer's lounge, a sports bar, the Eagle's Nest restaurant, the Java Coast Coffee Bar, the Recruit Recreation Center, the Ship Rec Recreation Center, and the Undergrounds Café (U.S. Navy, 1999b).

Fort Sheridan Housing Annex

On site recreational facilities at FSHA consist of two baseball fields and a tot lot. The tot lot has swings, slides, and climbing equipment (U.S. Navy, 2001g).

Glenview Housing Annex

On site recreational facilities at GHA consist of three basketball courts and a tot lot. The tot lot has swings, slides, and climbing equipment (U.S. Navy, 2001g).

3.3.10 Cultural Resources

Main Installation

The Main Installation contains a coherent historic district composed of 37 extant original buildings and other related historic properties. These structures are located in the area of the Main Installation known as "Mainside," which is the location of the original Naval Training Station and has remained the heart of the NTC throughout its history. The 193.2-acre (78.2-ha) historic district is located at the eastside of the Main Installation, adjacent to Lake Michigan (*Figure 3-13*). The historic district contains 124 buildings, structures and sites. Of these, 44 represent contributing components of major significance to the historic district (see *Figure 3-13* and *Table 3-9*), 19 are of minor significance, and the remainder (61) are non-contributing properties. The properties of minor significance include the many structures along the lakeshore, such as breakwaters, small craft berths, bulkheads, and jetties. In addition to the buildings and structures described, certain sites and natural features are important to the character and significance of the historic district. Man-made features include the Inner Harbor and the parade ground known as Ross Field. Both retain their original appearance and contribute strongly to the historic context of the area. Pettibone Ravine, Pettibone Creek, and the lakeshore are all natural features that were critical to the founding, organization and development of the NTC. These natural features retain their appearance, and enhance the historic character of the district (U.S. Navy, 2000f). In 1991, a Programmatic Agreement (PA) was made between the NTC Great Lakes, the Advisory Council on Historic Preservation, and the Illinois State Preservation Officer (SHPO) concerning the historic district.

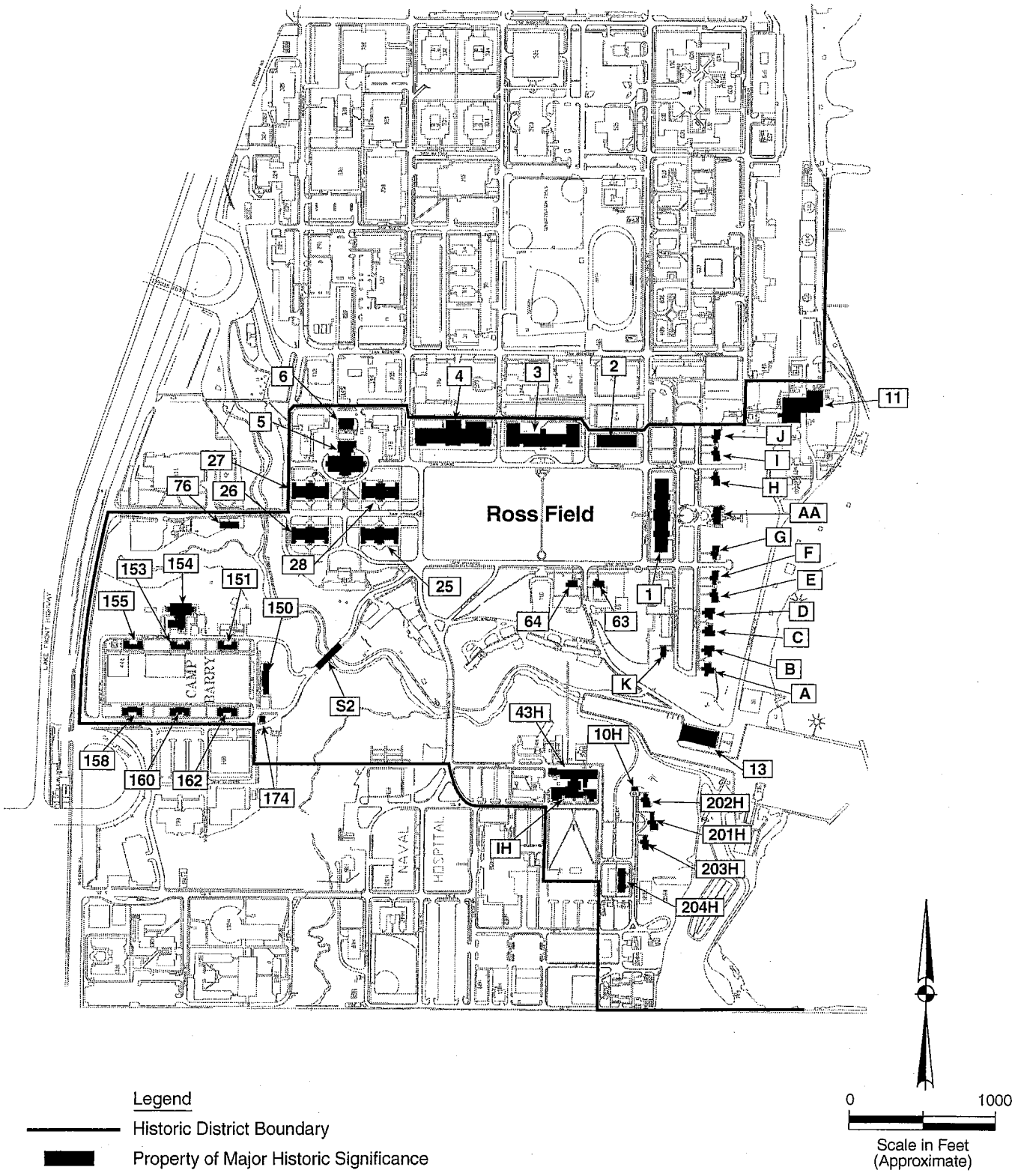


Figure 3-13. Historic District and Contributing Properties of Major Significance - NTC Great Lakes (U.S. Navy, 1994)

Note: Multiply by 0.3048 to convert feet to meters.

TABLE 3-9 CONTRIBUTING PROPERTIES OF MAJOR HISTORIC SIGNIFICANCE WITHIN NTC GREAT LAKES HISTORIC DISTRICT

Building Number	Date of Construction	Original Use	Current Use
1	1906	Administration	Administration
2	1906	Storehouse	Offices
3	1906	Instruction	Administration; Chapel
4	1906	Drill Hall	Armory; Gymnasium
5	1906	Mess Hall and Galley	Public Works Shop
6	1906	Brig	Detention Facility
11	1906	Power House	Power Plant
13	1906	Boathouse	Boathouse
25	1906	Dormitory	Administration
26	1906	Dormitory	Administration
27	1906	Dormitory	Administration
28	1906	Dormitory	Administration
150	1906	Receiving Building	Navy Band
154	1906	Galley and Laundry	Special Services
174	1906	Guardhouse	Repair Shop
151	1907	Dormitory	Recreational Services
153	1907	Dormitory	Nursery School; MARS
155	1907	Dormitory	Hobby Shop; Boy Scouts
158	1907	Dormitory	Recreational Services
160	1907	Dormitory	Recreational Services
162	1907	Dormitory	Thrift Shop
1H	1909	Hospital	Offices; Laboratories
43H	1909	Laundry	Offices; Laboratories
201H	1909	Officer's Quarters	Officer's Quarters
202H	1909	Officer's Quarters	Officer's Quarters
203H	1909	Officer's Quarters	Officer's Quarters
AA	1911	Commandant's Quarters	Commandant's Quarters
A	1908	Officer's Quarters	Officer's Quarters
B	1908	Officer's Quarters	Officer's Quarters
C	1908	Officer's Quarters	Officer's Quarters
D	1908	Officer's Quarters	Officer's Quarters
E	1911	Officer's Quarters	Officer's Quarters
F	1911	Officer's Quarters	Officer's Quarters
G	1911	Officer's Quarters	Officer's Quarters
I	1911	Officer's Quarters	Officer's Quarters
J	1911	Officer's Quarters	Officer's Quarters
63	1915	Radio Station Building	Officer's Quarters
64	1918	Radio Operator's Quarters	Officer's Quarters
76	1916	American Red Cross	American Red Cross
10H	1925	Detached Garage	Detached Garage
204H	1927	Officer's Apartments	Officer's Apartments
K	1918	Officer's Quarters	Officer's Quarters
S2	1911	Vehicular Bridge	Vehicular Bridge

Source: U.S. Navy, 1994

Pursuant to that agreement, any planned work, including new construction, repairs, modifications, or demolitions of existing facilities within and immediately adjacent to the historic district are subject to review and evaluation by the SHPO (U.S. Navy, 1994).

In addition to the structures located in the historic district on Mainside, four existing drill halls (Buildings 800, 1000, 1200, and 1400) and the existing Navy Brig (Building 914), all located with the boundaries of the RTC Great Lakes, are over 50 years of age and are eligible for listing on the National Register of Historic Places (NRHP). However, the existing drill halls were originally constructed in 1942 as temporary buildings, with an intended useful life of five years. The treatment of World War II temporary buildings has been addressed in a 1986 National PA among the Department of Defense, the Advisory Council on Historic Preservation and the National Conference of State Historic Preservation Officers. As set forth in the 1986 PA, World War II temporary buildings were documented in the USACE publication, "World War II Temporary Military Buildings (USACERL Technical Report CRC-93/01, March 1993)." The treatment of all four buildings has been addressed in the 1986 PA and USACE publication, and it was determined that those documents fully mitigate for demolition of all Word War II temporary buildings, including Buildings 800, 1000, 1200, and 1400.

The existing Navy Brig (Building 914) was also constructed in 1942 and is the only remaining permanent World War II building located within the RTC. As part of a 1999-2000 inventory and evaluation of the RTC area, Building 914 was identified as a historically significant structure and was recommended as eligible for the NRHP (U.S. Navy, 2000g). The SHPO recommended that the Navy complete and submit Historic American Buildings Survey Level II (HABS Level II) survey documentation for the building prior to any demolition activities. This documentation creates a permanent record of the building and serves as mitigation for the building's proposed demolition. The pre-final HABS Level II documentation was provided to the SHPO for concurrence on July 17, 2000. A Memorandum of Agreement (MOA) regarding the demolition of Building 914 was executed on August 8, 2000, and the Illinois Historic Preservation Agency accepted the pre-final HABS Level II survey on August 16, 2000. The final version of the HABS Level II survey was provided to complete the requirements of the MOA on September 5, 2000.

An archeological survey conducted during 1999 at the Main Installation resulted in the documentation of seven previously unrecorded archeological sites (*Figure 3-14*). These sites consisted of one circa 1909 concrete bridge remnant and associated roadcut (11-L-625), circa 1909 footings of a former foot bridge (11-L-626), a concentration of apparent World War I era artifacts and a compacted gravel and tar surface which probably represents the location of a temporary wooden structure (11-L-627), a concrete foundation and pipe bridge representing a World War II era sewage disposal plant (11-L-628), a concrete foundation and floor representing a shed or similar type of outbuilding which probably dates to World War II (11-L-629), and concentrations of artifacts representing a World War II era Chapel (11-L-630) and Marine Corps barracks (11-L-631). With the exception of 11-L-627, the archeological sites encountered during the investigation were not recommended as eligible for inclusion on the NRHP. No further work was recommended for these sites. However, because of the apparent rarity on the installation of intact sites of the type represented by 11-L-627, and the increased importance being placed on World War I era sites, it was suggested that this site might be eligible for listing on the NRHP. Avoidance of this site was recommended. Should it be necessary to impact 11-L-627 at some future date, Phase II site testing was recommended (U.S. Navy, 2000h).

Additionally, archeological surveys were conducted on the RTC in Camp Porter at the site of a suspected Nineteenth Century farmstead along the western boundary (north of the South Porter

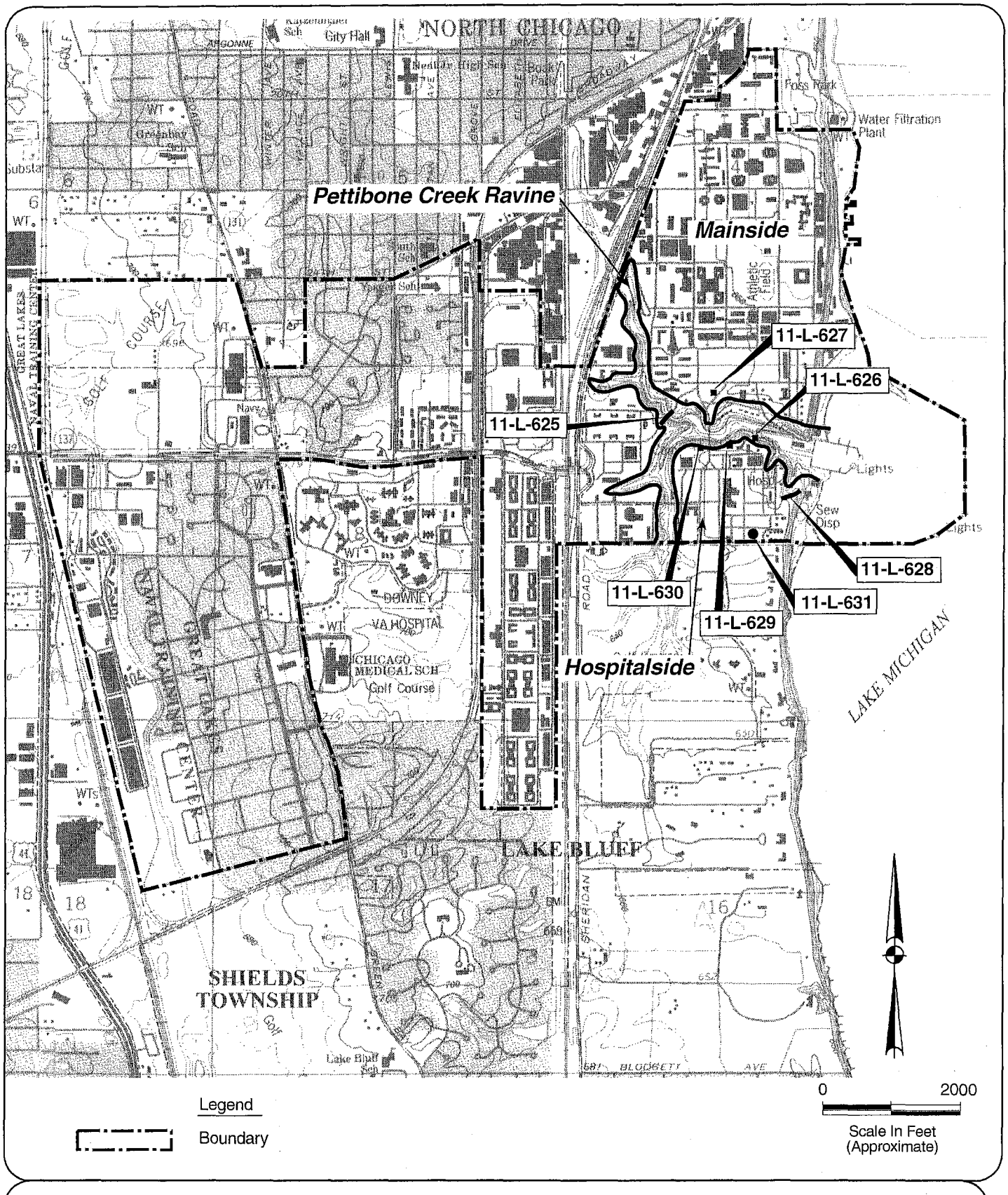


Figure 3-14. Archeological Sites at the Main Installation (U.S. Navy, 2000)

Note: To convert feet to meters, multiply by 0.3048.

Parade Ground). These investigations did not identify any archeological sites or deposits eligible for the NRHP (U.S. Navy, 2000i).

Fort Sheridan Housing Annex

There are 16 historic properties located at FSHA, with 15 of these properties being duplex houses located along Westover Road. These 15 properties include Building 339, Buildings 341 through 353, and Building 355. The sixteenth property is Building 142, a former barracks that has been converted to office space. In 1997, the Navy started coordinated with the SHPO concerning the potential disposal of these properties. On November 19, 1999, the SHPO indicated that "no adverse effect" would occur as long as the Navy included a protective convent as part of the disposal agreement. A copy of this concurrence is on file at Southern Division, and may be viewed by contacting the Historic Preservation Officer (U.S. Navy, 2001h).

Glenview Housing Annex

An archeological survey was conducted in 1993 for the proposed family-housing area, now the GHA, at the previous Naval Air Station Glenview. Personnel from the SHPO toured the proposed housing area to determine the potential for historic buildings within the area. Based on that survey, information contained within the draft Environmental Impact Statement being performed on the project, and the results of an archeological Phase I reconnaissance report, the SHPO determined that no significant historic, architectural, or archeological resources were located in the project area (U.S. Navy, 1994).

4.0 ENVIRONMENTAL CONSEQUENCES

As discussed in *Section 2.0*, two levels of intensity (low- and moderate-intensity) were considered for the integration of the four areas of natural resources management (forestry management, fish and wildlife management, land management, and management for outdoor recreational opportunities) at NTC Great Lakes. The first level of intensity (Alternative 1 – Low-Intensity) involved meeting all the mandatory requirements for compliance with laws, regulations, permits, executive orders, and DoD policy. No stewardship initiatives were considered at this level. The second level of intensity (Alternative 2 – Moderate-Intensity) included all the mandatory requirements of Alternative 1, plus incorporated those stewardship initiatives that are considered reasonable and achievable for the installation. Consistent with Department of the Navy guidance on preparing NEPA documents for INRMPs (U.S. Navy, 1998b), the No Action Alternative (continued implementation of the current Natural Resources Management Plan) has not been included in the impact analysis because it does not meet the requirements of SAIA (see *Section 2.3*).

Although both Alternatives 1 and 2 meet the basic objectives of integrating the areas of natural resources management established in SAIA, Alternative 2 is more proactive in meeting the SAIA requirements for multiple use, protection, and enhancement of natural resources; and maintenance of biological integrity. Alternative 2 is the plan presented in the INRMP for implementation at NTC Great Lakes; however, possible funding constraints for the proposed stewardship projects may prevent full implementation. The plan most likely to be implemented at NTC Great Lakes is Alternative 1 plus those stewardship projects identified under Alternative 2 that are ultimately funded.

Funding for implementation of the INRMP would come from the Installation, Chief of Naval Education and Training (the Major Claimant), or Naval Facilities Engineering Command natural resources fund sources. The natural resources programs and projects described in the INRMP are divided into mandatory and stewardship categories to reflect implementation priorities. Every effort would be made to acquire O & M(N) Environmental, or other funding to implement DoD mandatory projects, in the most timely manner possible. Stewardship-type projects would be funded through forestry, agricultural outlease, fish and wildlife, Legacy, or other fund sources as funding and personnel resources become available.

As discussed in *Section 1.1*, the impact analysis contained in this EA focuses on the evaluation and comparison of alternative plans in terms of the management objectives of integrating forestry management, fish and wildlife management, land management, and management for outdoor recreational opportunities, not the individual projects or practices. The content of the impact analysis is, therefore, "programmatic" in that it evaluates alternative programs for managing an installation's natural resources.

4.1 PHYSICAL ENVIRONMENT

4.1.1 Earth Resources

Geology and Topography

The low-intensity mandatory natural resources management practices proposed as part of Alternative 1 include minimal new construction activities at NTC Great Lakes, and only three projects that would result in minimal impacts to topography. The construction-related activities anticipated as part of

implementation of Alternative 2 would be, in most cases, minor. For these alternative plans, site topography would be minimally altered from any required site grading, construction, or demolition activities. Some minor excavation and/or fill would also be required. Soil excavation and fill activities would result in the temporary presence of mounds of soil/fill or open excavation areas. Overall final elevations in the area would remain generally unchanged, however, and topographic impacts in the area would be minor. No significant impacts to geologic resources or to the overall topography of the NTC or the local area are expected from the implementation of either Alternative 1 or Alternative 2 at NTC Great Lakes. No impacts to the 100-year flood elevations in the various project areas are also anticipated.

Soils

Any construction activities proposed as part of either intensity-level alternative should not affect soil characteristics, but could cause the top layers to mix. These activities would also temporarily increase soil erosion. Any construction activities that affect more than five acres (two ha) would require preparation of a Notice of Intent (NOI) under the requirements of the National Pollutant Discharge Elimination System (NPDES) General Permit for Construction Activities. The requirements of the NOI include the preparation and implementation of a Storm Water Pollution Prevention Plan (PPP). This PPP must include erosion and sediment controls, including interim and permanent stabilization practices. Recommended methods of erosion control include the use of silt fences, hay bales, check dams, and temporary vegetation or straw cover. Additionally, construction activities disturbing one to five acres (0.4 to 2.0 ha) are now covered by the NPDES – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges (Phase II Storm Water Regulations – *Federal Register*, Volume 64, No. 235, Wednesday, December 8, 1999, pages 68722 – 68770). Deadlines established for completion of both the NPDES permitting authority's and the permittee's program responsibilities is outlined in *Exhibit 2*, page 68738, of the December 8, 1999 *Federal Register*. The permit application deadline for stormwater discharges associated with small project (one to five acres [0.4 to 2.0 ha]) construction activities was established as 3 years and 90 days from the final rule date, or March 7, 2003. Specific permit requirements will have to be followed by the General Contractor once they are implemented.

Both alternatives meet the management objectives of SAIA. The low-intensity mandatory natural resources management practices proposed as part of Alternative 1 initially add only two soils protection projects, and several projects that could result in recommendations for additional long-term protection and enhancement projects. However, over the long-term, the implementation of the moderate-intensity natural resources management practices (including additional long-term protection and enhancement activities) included as part of Alternative 2 are anticipated to do a better job of minimizing the potential for erosion to soils on NTC Great Lakes than the practices included in Alternative 1. The protection and enhancement activities proposed as part of both Alternatives 1 and 2 would represent a potential beneficial impact related to soils; however, Alternative 2 would meet the SAIA protection and enhancement requirements better than Alternative 1.

No soils classified by the Natural Resources Conservation Service (NRCS) as prime and unique farmland would be affected by the implementation of either alternative plan.

4.1.2 Air Resources

The low-intensity mandatory natural management practices proposed as part of Alternative 1 include minimal new construction activities at NTC Great Lakes, and no projects that would result in

long-term deterioration of the air quality of the region. Various new construction activities would be associated with implementation of some of the stewardship projects proposed as part of Alternative 2 at NTC Great Lakes. Although the overall construction activities are anticipated to be minor for either alternative, these activities would be expected to generate air emissions. The potential air emission sources during any construction activities would include front-end loaders, trucks, and other predominately diesel-powered construction equipment. Temporary increases in dust emissions in the immediate vicinity of any construction sites would likely occur, resulting in increased atmospheric opacity. Fugitive dust from possible construction activities can be prevented from becoming airborne through adherence to local ordinances and implementation of the following measures:

- Use of water to control dust generated by possible construction operations, and during any clearing and grading of land
- Application of water to dirt paths, gravel roads, materials, stockpiles, and other surfaces that can produce airborne dust over extended periods
- Periodic street sweeping and/or wetting down of paved roadway surfaces

Construction machinery exhaust emissions would be anticipated to be of relatively short duration and of moderate intensity. Since construction equipment exhaust emissions would be expected to be of relatively small quantities, no significant deterioration of air quality would be expected; however, since the Metropolitan Chicago Interstate AQCR is classified as a severe *non-attainment* area for ozone, proposed federal actions must show conformity to the State Implementation Plan (SIP) before they can be implemented. The construction-related activities proposed in the INRMP would need to produce less than the *de minimis* level of 25 tons per year (TPY) [22.7 metric TPY] for each of the ozone precursors: oxides of nitrogen and volatile organic compounds, to avoid a conformity determination. Prior to implementation of any of the construction-related activities proposed, an applicability analysis would be performed to determine if a formal conformity determination is required, or if a Record of Non-Applicability can be prepared.

4.1.3 Sound Environment

The low-intensity mandatory natural resources management practices proposed as part of Alternative 1 include minimal new construction activities at NTC Great lakes, and no projects that would result in long-term sound impacts to the area. Implementation of the some of the stewardship projects proposed as part of Alternative 2 would require some new construction activities. Short-term impacts on community noise levels during any construction activities would include noise from construction equipment and noise from construction vehicles/delivery vehicles traveling to and from the proposed construction site(s). Construction-related equipment noise levels generally range from 76 dB for hoist operations and 85 dB for backhoe operations to a maximum of 101 dB for pile-driver operations. Noise levels related to the anticipated construction activities at a given receptor would vary widely, depending on the phase of construction, land clearing and excavations, etc., and the specific tasks undertaken. Some increased noise levels would be anticipated to be perceptible to any nearby neighborhoods that are located adjacent to the construction areas during the construction period. To minimize the potential impacts of construction noise to surrounding areas, the Navy would limit the erection, or any excavation associated with the proposed action to daylight hours, when occasional loud noises are more tolerable. Extended disruption of normal activities would not considered likely because of the relatively short-term exposure periods anticipated on any one receiver during the potential construction phases. No significant impacts related to construction noise would be anticipated

as a result of the implementation of the proposed projects included as part of either Alternative 1 or Alternative 2 at NTC Great Lakes.

Over the long-term, implementation of the proposed stewardship projects included in Alternative 2 is not expected to generate significant noise levels. The primary noise produced would be expected to be sound from any necessary maintenance activities needed to maintain anticipated preservation and enhancement measures, and any recreational facilities proposed. Additionally, noise would be expected to be associated with any human activities related to the possible recreational enhancements at NTC Great Lakes. Prediction of future sound levels generated from maintenance or recreational activities is dependent on the high degree of variance of noise sources and inconsistency of duration of sound levels related to the activities, i.e., the type of maintenance activity, the number of participants in any recreational activity, and the amount of verbal communication. However, sound in close proximity to NTC Great Lakes would continue to range from the low-50 to mid-60 dB level for residential areas and from approximately 60 to 80 dB for most other areas, consistent with current conditions. No significant impacts would be anticipated.

4.1.4 Water Resources

Both alternatives meet the management objectives of SAIA; however, the low-intensity mandatory natural resources management practices proposed as part of Alternative 1 would generally be similar to existing conditions. Over the long-term, the implementation of the moderate-intensity natural resources management practices (data collection, monitoring, and protection and enhancement activities) included as part of Alternative 2 are anticipated to do a better job of improving the quality of surface waters located on the Installation, maintaining groundwater quality, and improving the quality of discharge waters entering Lake Michigan.

4.2 BIOLOGICAL RESOURCES

4.2.1 Vegetation

Both alternatives meet the management objectives of SAIA, and provide continued protection of vegetative communities and removal of invasive species; however, the projects included as part of Alternative 1 would not include any long-term proactive enhancement of the vegetation located on NTC Great Lakes. For Alternative 2, some of the proposed outdoor recreation management projects require the construction and clearing of nature trails or outdoor recreational areas that would remove some native vegetation. The amount of this removal is anticipated to be minimal, and would affect smaller, previously disturbed areas. To prevent erosion, any trails and other open areas would be seeded with native vegetation that would form an effective groundcover. Over the long-term, the implementation of the moderate-intensity natural resources management practices (protection and enhancement activities) included as part of Alternative 2 are anticipated to do a better job of improving the quantity and quality of the vegetation on the Installation. The stewardship land management and fish and wildlife management projects included in Alternative 2 propose additional protection, enhancement, and maintenance practices that would represent a potential beneficial impact related to the vegetated communities located on the Installation, and would meet the SAIA protection and enhancement requirements better than Alternative 1.

4.2.2 Wildlife

The low-intensity mandatory practices proposed as part of Alternative 1 include minimal new natural resources enhancements to benefit area wildlife. The proposed stewardship management practices

included as part of Alternative 2 are anticipated to do a better job of providing for long-term improvements and enhancements to benefit area wildlife than Alternative 1.

4.2.3 Threatened and Endangered Species

No Federally listed threatened or endangered species have been found within NTC Great Lakes. Thus, no impacts to threatened or endangered species are anticipated as a result of the implementation of either Alternative 1 or Alternative 2. The species monitoring and surveys included in both alternatives would allow for proactive protection and management of endangered species by providing early detection of their presence. By continually monitoring for threatened and endangered species, potential impacts from natural resource and other activities would be minimized if a threatened or endangered species becomes resident on NTC Great Lakes.

4.2.4 Wetlands

No fills of wetlands are anticipated as part of implementation of either of the proposed alternatives. Additionally, further loss of wetlands would not result from the management actions in either alternative. The wetland surveys and delineations included in both alternatives would allow for proactive protection and management of the wetland areas located on the Installation. Alternative 2 would improve the wetland resources of NTC Great Lakes by removing invasive species and restricting access to the panne wetland.

4.3 SOCIOECONOMIC RESOURCES

4.3.1 Community Setting and Land Use

Implementation of either of the intensity-level alternatives would not require a change in land use at the NTC or the surrounding areas. Land use on NTC Great Lakes would continue to consist of four general categories: improved grounds, semi-improved grounds, unimproved grounds, and other. The land use surrounding NTC Great Lakes would not be affected by the implementation of either of the intensity-level alternatives at NTC Great Lakes.

4.3.2 Demographics

No military personnel would be relocated to the NTC as a part of implementation of either alternative. The current station loading is approximately 25,140 and activities generally anticipated, as part of implementation of either intensity-level alternative at NTC Great Lakes, would not directly or indirectly impact the population or demographic composition of the area.

4.3.3 Economic Activity

Direct or indirect long-term impacts to the local economic activity, employment, and income would be minimal, if any, as a result of the activities anticipated as part of implementation of either of the intensity-level alternatives at NTC Great Lakes.

4.3.4 Environmental Justice

Based upon 1990 U.S. Census information (see *Section 3.3.4*), low-income or minority populations would not be expected to be disproportionately and adversely affected as a result of the implementation of either of the intensity-level alternatives. In addition, no disproportionate

environmental health or safety risks to children would be anticipated as a result of activities generally anticipated as a result of the implementation of either of the intensity-level alternatives.

4.3.5 Housing

There would be no direct or indirect impacts to existing housing at the Main Installation, FSHA, or GHA as a result of implementation of either of the intensity-level alternatives. Neither alternative adds new military personnel; therefore, additional housing demands should not result.

4.3.6 Education

No impact to facilities used for training/education would be anticipated as a result of implementation of either of the intensity-level alternatives. Activities generally anticipated as part of implementation of the stewardship outdoor recreational activities proposed as part of Alternative 2 would be beneficial to natural resource education and increase the number of educational opportunities at NTC Great Lakes.

4.3.7 Police and Fire Protection

Police and fire protection, including emergency medical services, should not be affected by the implementation of the low-intensity mandatory projects included as part of Alternative 1. For Alternative 2, emergency medical facilities could experience a higher call rate if the recreational opportunities were increased at NTC Great Lakes.

4.3.8 Utilities

The construction-related activities generally anticipated as part of implementation of either of the intensity-level alternatives at NTC Great Lakes would be, in most cases, minor. Therefore, significant direct or indirect impacts to electricity, potable water, natural gas, or solid waste disposal services would not be anticipated.

4.3.9 Recreation

No outdoor recreational opportunity projects are included as part of Alternative 1 because they are not considered mandatory in applicable laws, regulations, permits, executive orders, and DoD policy. Alternative 2 proposes potential projects that would enhance outdoor recreational activities and improve ecosystem awareness. Thus, implementation of Alternative 2 would represent a potential beneficial impact related to outdoor recreation, and would meet the SAIA requirements better than Alternative 1.

4.3.10 Cultural Resources

As discussed in *Section 3.3.10*, there are several historic properties and archeological sites located at NTC Great Lakes. There are no plans to either manage or impact these properties or sites as part of the proposed INRMP; however, several of the erosion control plans proposed may result in providing for the long-term protection of these properties. Consistent with the existing PA, any planned work, including new construction, repairs, modifications, or demolitions of existing facilities within and immediately adjacent to the historic district would be provided for review and evaluation of the SHPO.

4.4 CUMULATIVE IMPACTS

Cumulative impacts are those changes to the physical, biological, and socioeconomic environments that would result from the combination of the associated impacts resulting from the implementation of the proposed action when added to other past, present, and reasonably foreseeable actions. Past projects, or those implemented or built before 2001, can be considered to be part of the existing conditions environment baseline presented in this EA. Included within the concept of past projects are all maintenance activities, land development projects, and other actions that occurred before detailed analysis began on this EA. Past projects at NTC Great lakes have collectively reduced the availability of upland wildlife habitat and wetlands areas. Past projects have contributed to the pollution burden of air, soils, and natural water bodies. Changes to the environment at NTC Great Lakes have occurred over time making formerly natural areas, wetlands and woodlands, less attractive to certain animal and bird species.

NTC Great Lakes is located adjacent to Lake Michigan and the greater Chicago area, an area influenced by existing industrial, commercial, residential, and recreational development. Although there are no current plans for development in the areas immediately adjacent to NTC Great Lakes, it can be anticipated that the area would continue to be influenced by potential industrial, commercial, residential, and recreational development. It is unlikely that the proposed implementation of an INRMP at NTC Great Lakes would stimulate any of these potential industrial, commercial, residential, and recreational development activities. The alternatives proposed in this INRMP consist of either low-intensity or moderate-intensity land management, fish and wildlife management, and management for outdoor recreational opportunities. There are no forestry management opportunities at NTC Great Lakes.

All potential projects would contribute to the burden on air, soils, and natural water bodies in the area; however, the intent in development of an INRMP is to promote effective planning, development, maintenance, and coordination of wildlife, fish, and game conservation and rehabilitation at military installations. While some short-term impacts to natural resource areas would occur during construction of some of the proposed INRMP projects, none of the projects would result in long-term negative impacts to the area. Implementation of the low-intensity mandatory natural resources management practices at NTC Great Lakes would result in continued, or improved, protection to various natural resources. This would be a continuation of most of the current practices at NTC Great Lakes, with the addition of some long-term enhancement projects. There would be very few, if any, improvements to either regional or community natural resources as a result of these practices.

Implementation of the moderate-intensity stewardship natural resources management practices would result in more proactive measures being implemented for multiple-use, protection, and enhancement of natural resources; and maintaining biological integrity. Some of the proposed practices would result in improved erosion control (re-vegetation of slopes, bluffs, shorelines, etc.) and improved water quality. There would also be some improvement to wildlife habitat on the Installation. This positive impact would be small when considered on a regional scale. Except for possible recreational opportunities, impacts to socioeconomic resources would be minimal. The potential moderate-intensity practices proposed would enhance outdoor recreational activities and improve ecosystem awareness. This would represent a potential beneficial impact related to outdoor recreation opportunities, although small, for the region. In general, there would be some overall small positive benefits to the region with the implementation of the proposed moderate-intensity natural resources management practices.

4.5 COMPLIANCE WITH VARIOUS LAND USE POLICIES AND CONTROLS

This EA has been prepared in accordance with the following regulations:

- The Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) Regulations (P.L. 91-190; 42 USC 4321 *et seq*; 40 CFR 1500-1508).
- OPNAVINST 5090.1B (Change 2), which implements, within the Department of the Navy, the requirements set forth by NEPA.

A summary of the various laws and coordination requirements and the extent to which the proposed action complies or conflicts with each of these laws and requirements are presented in this section.

4.5.1 National Environmental Policy Act

The National Environmental Policy Act of 1969, as amended, contains policy and guidance to ensure that potential impacts from proposed federal actions are assessed using a systematic and interdisciplinary approach. This EA has been prepared in accordance with *Section 102(2)(c)* of NEPA, CEQ regulations on implementing NEPA procedures (40 CFR 1500-1508), and Department of the Navy regulations on implementing NEPA procedures (32 CFR 775).

4.5.2 Clean Water Act

The Clean Water Act, as amended, regulates discharges to the waters of the United States. Compliance with applicable provisions of the Clean Water Act will be accomplished by coordination with the appropriate resource agencies, submittal of permit applications, if required, and response to agency review. *Section 404* of the Act regulates the discharge of dredged or fill material. Any point sources of pollution associated with the proposed action will comply with NPDES permit requirements.

4.5.3 Rivers and Harbors Act of 1899

Section 10 of the Rivers and Harbors Act of 1899 prohibits the unauthorized obstruction or alteration of any navigable water of the United States unless the work has been authorized by the Secretary of the Army by a permit. For any proposed Navy actions that would impact navigable waters of the United States, *Section 10* permit applications would be made to the USACE in accordance with the Rivers and Harbors Act, as necessary.

4.5.4 Clean Air Act

The Clean Air Act, as amended, provides for protection and enhancement of the nation's air resources. Particulate matter and other air pollutants resulting from any construction activities would have a short-term air quality impact on the immediate vicinity, but no permanent or long-term impacts to regional air quality related to implementation of the proposed INRMP are anticipated to occur; however, since the Metropolitan Chicago Interstate AQCR is classified as a severe *non-attainment* area for ozone, proposed federal actions must show conformity to the SIP before they can be implemented. The construction-related activities proposed in the INRMP would need to produce less than the *de minimis* level of 25 TPY (22.7 metric TPY) for each of the ozone precursors: oxides of nitrogen and volatile organic compounds, to avoid a conformity determination. Prior to implementation of any of the construction-related activities proposed, an applicability analysis would be performed to determine if a formal conformity determination is required, or if a Record of Non-Applicability can be prepared.

4.5.5 Sikes Act Improvement Act of 1997

The intent of SAIA is to promote effective planning, development, maintenance, and coordination of wildlife, fish, and game conservation and rehabilitation in military installations. *Section 2904* of SAIA requires the Secretary of each military department to prepare and implement an INRMP for each military installation in the United States under the jurisdiction of the Secretary, unless the Secretary determines that the absence of significant natural resources on a particular installation makes preparation of such a plan inappropriate. NTC Great Lakes has sufficient natural resources to require preparation of an INRMP. The focus of this EA is the proposed development of an INRMP for NTC Great Lakes. The document provides the decision-maker with information needed to understand the future environmental consequences that could result from the implementation of the INRMP at NTC Great Lakes.

Additionally, *Section 2904* of SAIA also states that the INRMP shall reflect the mutual agreement of the FWS and the state fish and wildlife agency, in this case IDNR, concerning conservation, protection, and management of fish and wildlife resources. Consistent with the requirements of the SAIA, the draft INRMP will be provided to the USFWS and INDR for review and comment, and to obtain the mutual agreement of their agency.

4.5.6 Fish and Wildlife Coordination Act

Section 10 of the Fish and Wildlife Coordination Act (16 USC 661-666) directs federal agencies to consult with USFWS, National Marine Fisheries Service (NMFS), and state agencies before authorizing alterations to water bodies. The purpose of this Act is to ensure that wildlife conservation receives equal consideration. Any funded projects that include alternations to water bodies would be coordinated with these agencies prior to any construction activity. Additionally, as discussed above, *Section 2904* of SAIA states that the INRMP shall reflect the mutual agreement of the USFWS and the state fish and wildlife agency, in this case IDNR, concerning conservation, protection, and management of fish and wildlife resources. Consistent with the requirements of SAIA, the draft INRMP will be provided to the USFWS and IDNR for review and comment, and to obtain the mutual agreement of their agency.

4.5.7 Endangered Species Act

Section 7 of the Endangered Species Act of 1973, as amended, requires the responsible federal agency to consult with USFWS and NMFS concerning endangered and threatened species under their jurisdiction. Lists of endangered or threatened species which could potentially exist at NTC Great Lakes previously received from the USFWS and IDNR were reviewed. *Section 4.2.3* documents potential impacts to threatened and endangered species and the coordination that has occurred regarding threatened and endangered species.

4.5.8 National Historic Preservation Act

As discussed in *Section 3.3.10*, there are several historic properties and archeological sites located at NTC Great Lakes. There are no plans to either manage or impact these properties or sites as part of the proposed INRMP; however, several of the erosion control plans proposed may result in providing for the long-term protection of these properties. Consistent with the existing PA, any planned work, including new construction, repairs, modifications, or demolitions of existing facilities within and immediately adjacent to the historic district would be provided for review and evaluation of the SHPO.

4.5.9 Coastal Zone Management

The Coastal Zone Management (CZM) Act of 1972, as amended, provides for the effective management, beneficial use, protection, and development of the resources of the nation's coastal zone. The state of Illinois does not have an approved CZM program, so this requirement does not apply.

4.5.10 Local Land Use Plans

Implementation of the proposed action would not require a change in land use at the NTC or the surrounding areas. Land use on NTC Great Lakes would continue to consist of four general categories: improved grounds, semi-improved grounds, unimproved grounds, and other. The land use surrounding NTC Great Lakes would not be affected by the implementation of either of the intensity-level alternatives at NTC Great Lakes.

4.5.11 Floodplain Management

Executive Order 11988 "*Floodplain Management*," requires that federal agencies avoid activities which directly or indirectly result in development of floodplain areas. It is not anticipated that potential projects implemented as part of the INRMP at NTC Great Lakes would result in development of the 100-year floodplain.

4.5.12 Wetlands

Executive Order 11990 "*Protection of Wetlands*," directs agencies to take actions to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands on federal property. Implementation of the proposed INRMP at NTC Great Lakes includes preserving and enhancing those ecosystem types that are important to training of personnel and day-to-day operations of the installation; thus, to the maximum extent possible, destruction, loss, or degradation of wetlands would be minimized. A permit application would be submitted for any activities requiring impacts to wetland areas, as necessary.

4.5.13 Prime and Unique Farmlands

The purpose of the Farmland Protection Policy Act is to minimize the extent to which federal programs contribute to the necessary and irreversible conversion of farmland to nonagricultural uses. No soils classified by the NRCS as prime farmland soils will be affected by the proposed action.

4.5.14 Administration of Environmental Policy (Environmental Justice)

The potential effects of the proposed action have been evaluated in accordance with the requirements of Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*; and Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. These executive orders mandate that federal agencies identify disproportionately high and adverse human health or environmental effects on minority and low-income populations and children. As discussed in *Section 4.3.4*, no disproportionate and adverse impacts to minority or low-income persons living in the area surrounding the proposed project site would be anticipated as a result of the implementation of the proposed action. In addition, no disproportionate environmental health or safety risks to children would be anticipated as a result of the implementation of the proposed action.

4.6 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL

Energy, in the form of various fossil fuels and electricity, would be required during any construction, operation, and maintenance of the recreational facilities. Prudent energy conservation features will be incorporated into this project wherever possible. Energy requirements for the proposed action would have no impact on energy requirements of the United States or the greater Chicago area.

It is not possible to determine the energy requirements for the construction of the proposed project. However, construction, in general, can be divided into various phases: ground clearing, site grading, installation, and finishing. Each of these phases would require varying levels of energy input. Diesel fuel would generally be the main type of energy required during any construction activities.

4.7 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Construction, maintenance, and operation of the proposed intensity-level projects would require the commitment of various resources. These resources could include the commitment of labor, capital, energy, biological resources, building materials, and land resources. Short-term commitments of labor, capital, and fossil fuels would result directly from construction of some of the proposed land management, fish and wildlife management, and outdoor recreational opportunities, and indirectly from the provisions of services to the various sites during construction. Long-term commitments of resources would result directly from maintenance and operation of the various projects, and indirectly from the provisions of water, sewage, electricity, gas, and solid waste services for some of the projects. Building materials would also be long-term commitments.

Duration of the commitment of land resources will depend on the ultimate reuse and life of the facilities and property. Since the proposed preferred use of the land is for long-term support of the military mission of the installation, the commitment of land resources is long-term.

4.8 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USE OF MAN'S ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Short-term commitments would include labor, capital, and fossil fuels that result directly from any construction activities, and indirectly from the provision of services to the various sites during construction. Few physical systems would be modified due to the effects of the construction. Over the long term, the proposed INRMP would provide for improved multiple use, protection, and enhancement of natural resources; and for improvements to maintaining biological integrity.

4.9 ADVERSE ENVIRONMENTAL IMPACTS WHICH CANNOT BE AVOIDED SHOULD THE PROPOSED ACTION BE IMPLEMENTED

Any clearing, grubbing, and filling of land that is needed for the implementation of the proposed INRMP would result in some soil erosion in the project area(s). The majority of soil erosion would take place during possible construction activities. Dust and vehicle emissions from possible construction activities would produce temporary impacts on air quality in the immediate region. Both (dust and vehicle emissions) are expected to disperse rapidly with lakefront winds. Any construction activities would occur during normal daily operating hours to reduce the effect of possible construction noise. Possible construction and clearing activities, although anticipated to be minor, could remove some

native vegetation. Socioeconomic impacts would be minor, if any, and would affect NTC Great Lakes primarily.

4.10 MEANS TO MITIGATE ADVERSE ENVIRONMENTAL IMPACTS

The construction contractor(s) should implement soil erosion control measures, such as the use of hay bales and silt fences, to minimize soil erosion during any possible construction activities as part of implementation of the proposed INRMP. The construction contractor(s) should also implement a spill contingency plan, prior to any construction activity, to reduce or eliminate the potential for contamination of soils from accidental spills and releases. Fugitive dust from construction activities could be prevented from becoming airborne through adherence to local ordinances and implementation of dust control measures, such as application of water to dirt paths, gravel roads, materials, stockpiles, and other surfaces.

5.0 LIST OF PREPARERS

The Navy liaison associated with the preparation of this document is:

Ms. Olivia Westbrook
Southern Division, Naval Facilities Engineering Command
P.O. Box 190010
North Charleston, South Carolina 29419-9010

The contractor responsible for preparing this document is:

Turner Collie & Braden Inc.
5757 Woodway
Houston, Texas 77057

The following individuals contributed to this Environmental Assessment:

Name and Document Contribution	Associated Professional Expertise
Robert C. Esenwein, C.E.P. Certified Environmental Professional Associate Vice President, Principal	Technical Director, Environmental Planning. Over twenty years of experience in preparing and managing interdisciplinary environmental studies and environmental assessments and impact statements, and coordinating permitting activities.
Patricia A. Matthews, P.E. Associate Vice President and Project Director	Project Director, Environmental Planning. Twenty years of experience in water resources and environmental planning and studies.
Jimmy L. Kosclski, P.E. Project Manager	Senior Project Manager. Twenty-seven years of experience in water resource planning and environmental planning studies.
Michael Rezsutek, Ph.D. Biological Resources	Environmental Specialist. Two years of experience in wetlands biology, CWA Section 404 permitting, and coastal planning.
Cinnamon Donovan Physical Resources Socioeconomic Resources	Environmental Specialist. Four years of experience in environmental assessment, regulatory compliance, and planning.
Hee Ork Rocha Graphic Design	Graphic Designer. Sixteen years of experience in drafting and technical graphic design.

6.0 COORDINATION

Federal, state, and local governments and agencies were consulted prior to and during the preparation of this Environmental Assessment. Most agencies were contacted in writing or by telephone, or visited during the course of the study. The agencies contacted are listed below.

Federal Agencies

U.S. Environmental Protection Agency, Region 5
U.S. Army Corps of Engineers, Chicago District
U.S. Fish and Wildlife Service, Chicago Illinois Field Office
Natural Resources Conservation Service

State Agencies

Illinois Environmental Protection Agency
Illinois Department of Natural Resources
Illinois Department of Conservation, Region II Headquarters
Illinois Historic Preservation Agency
Northeastern Illinois Planning Commission
Stormwater Management Commission

Local Governments and Entities

Lake County Department of Planning, Zoning, and Environmental Quality

northeastern illinois planning commission
222 S. Riverside Plaza • Suite 1800 • Chicago, IL 60606 • (312) 454-0400 • Fax (312) 454-0411 • http://www.nipc.cog.il.us

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Lake County Board
Ann Gilman, *Member*
McHenry County Board
Terri A. Wintermute, *Member*
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Appointed by the Board of the Regional Transportation Authority
Frank R. Miller
Appointed by the Board of the Chicago Transit Authority
Karen Dichiser
Appointed by the Board of Metra
Powell Anderson
Appointed by the Board of Pace
Thomas D. Marcucci
Appointed by the Board of the Metropolitan Water Reclamation District of Greater Chicago
Patricia Young
Appointed by the Board of the Illinois Association of Park Districts
Judy Beck
Appointed by the Board of the Chicago Park District
Gerald Sullivan
Appointed by the Board of the Illinois Association of Wastewater Agencies
A. E. Machak

March 27, 2000

Jimmy L. Kosclski, P.E.
Sr. Project Manager
TURNER COLLIE & BRADEN, INC.
P.O. Box 130089
Houston, TX 77219-0089

Re: INRMP, Great Lakes Naval Training Center, Job no. 32-00412-031

Dear Mr. Kosclski:

Thank you for providing me with information on the status of this project. As a member of the Northeastern Illinois Plan Commission and a resident of nearby Lake Bluff, I've followed the progress of NTC redevelopment plans with more than passing interest.

You may find the enclosed booklet useful and informative. The publication, *Protecting Nature in Your Community*, is a joint effort of NIPC and Chicago Wilderness, and was designed to assist local units of government in our six-county area to develop environmentally sound forward planning.

Should you wish to pursue any specific areas of interest with NIPC staff, I recommend you contact Dennis Dreher, Director of Natural Resources direct. Another valuable contact is Deborah Washington, NIPC Director of Project Review, who has extensive experience with such programs.

I appreciate the 'heads up' communication, and will continue to distribute your information to appropriate groups in the community. Thank you again for keeping us well informed.

Cordially,

Peter M. Sexton
Commissioner

cc: Dennis Dreher, NIPC
Deborah Washington, NIPC

LAKE COUNTY

STORMWATER MANAGEMENT COMMISSION

April 6, 2000

Jimmy L. Kosclski P.E.
Turner Collie & Braden Inc.
PO Box 130089
Houston, Texas 77219-0089
Fax 713-780-0838

Re: Integrated Natural Management Plan for Naval Training Center Great Lakes, Illinois TC&B Job. No. 32-00412-031

Dear Mr. Kosclski,

These comments are in response to your letter dated March 15, 2000 regarding the development of a Natural Resources Management Plan for Great Lakes Naval Training Center facilities in Lake County, Illinois. The mission of the Lake County Stormwater Management Commission (SMC) is to manage the county's water resources to reduce flood damage, improve water quality and protect natural resources. To that end, SMC administers the Watershed Development Ordinance (WDO), which requires a permit for new development and redevelopment; develops watershed plans for the county's twenty-six subwatersheds; mitigates flood damage through county-wide planning and projects; and supports in-the-ground projects that reflect SMC's mission with technical assistance and cost-share funding.

SMC has been cooperatively involved with the Great Lakes Naval Training Center (GLNTC) in both permitting and planning activities. Most recently GLNTC staff have participated in watershed planning for the North Branch of the Chicago River, and have conferred with regulatory staff regarding WDO compliance in redevelopment of the base. SMC has identified several areas that should be addressed in the Environmental Assessment for the Natural Resources Management Plan (Plan) for GLNTC.

1) **Stormwater Impacts** (from existing facilities and redevelopment activities)
   - *Flood Damage:*
     In addition to flood damage mitigation in the base housing area along the Skokie River, flood damage immediately upstream of the Willow Glen Golf Course and flooding of Lakefront Highway and 24th Street should also be addressed.

   - *Water Quality:*
     Development and redevelopment designs at NTC need to address water quality treatment of runoff as specified in the WDO. In addition, the plan should identify opportunities for retrofit best management practices to improve water quality.

Richard A. Welton, Chairman Ward S. Miller, Executive Director

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These practices may include infiltration techniques that also address runoff quantity and source reduction programs/practices.

The Plan should also address water quality impacts to Pettibone Creek and Lake Michigan from NTC and upstream discharges - and consider cooperative efforts to reduce pollutant discharges. Two major outfalls to Pettibone Creek on NTC and one outfall in each of two of the ravines in Fort Sheridan should be addressed in the Plan. NTC may consider establishing a regular water-quality monitoring program for each of these outfalls. The Plan may also address the sanitary sewer lines located through these ravines. The sanitary lines need to be regularly inspected for damage from erosion, and should be maintained or repaired as needed to reduce the risk for water pollution from leakage.

2) **Stream Protection/Enhancement**

- *Erosion:*
  Erosion along Pettibone Creek and Skokie River on the base should be addressed in the Plan, as well as NTC runoff impacts on off-site erosion along three channels running through the Shore Acres golf course immediately south of the NTC. The 1992 Lake Michigan Watershed Inventory and Pollution Plan developed by SMC and the Northeastern Illinois Planning Commission identified considerable erosion in the ravines on NTC and contaminated sediment accumulation at the mouth of Pettibone Creek where it enters Lake Michigan. Erosion was also identified as a significant problem in the ravines located at Fort Sheridan.

- *Plant Communities:*
  A natural resources inventory is warranted within the bluff/ravine system. The bluff/ravine environment is home to several woodland plant communities unique to Lake County. Thirty-eight percent of its flora grows in no other Lake County plant community. Many of these plant species have been lost to development, and those that remain are being threatened by fire suppression, heavy shading and slope erosion.[1]

- *Buffers:*
  The Plan should address, at minimum, compliance with the WDO related to stream, lake and wetland buffers at GLNTC and Fort Sheridan. Native riparian buffers should be established along the Skokie River, Pettibone Creek, the Fort Sheridan ravines and Lake Michigan, and managed for water quality and habitat values. The North Branch Watershed Plan recommends a buffer of 50 feet for the Skokie River, which reflects the East Skokie Drainage District easement.

[1] "Vascular Vegetation of Lake County, Illinois with Special Reference to its Use in Wetland Mitigation" by Gerould Wilhelm, 1991 as cited in the Lake Michigan Watershed Inventory and Pollution Plan.

- *Stream restoration:*
  Opportunities for stream restoration (may include pool-riffle development and low-flow re-meandering) should be evaluated in conjunction with streambank stabilization and establishment of riparian buffers.

3) Open Space Management

- The Willow Glen Golf Course and other open areas on GLNTC properties should incorporate natural resource restoration/enhancement in their design and management plans. Examples that could be included are wetland restoration and native plantings for buffers and along roadways.

Copies of the draft action plan recommendations (programmatic and site-specific) from the draft North Branch of the Chicago River Watershed Assessment and Management Plan that include the Skokie River at GLNTC are attached. These recommendations should be incorporated into the Plan in addition to the comments above.

Thanks for your consideration of these comments - please feel free to give me a call at (847)918-5269 if SMC can be of further assistance.

Sincerely,

Patricia S. Werner
Watershed Planner

c: David Ramsay, Friends of Chicago River, North Branch Planning Committee

Goal: Improve Water Quality in the North Branch of the Chicago River.

Objective 1: Reduce non-point and point source pollution loading to the North Branch to achieve a "good" or "B" stream quality ranking by the year 2010.

No.	Action Recommendation	Priority	Lead Agencies/ *Owner*[1]	Supporting Agencies/ *Owner*[1]	Target Date
1	Develop recommendations for planting native vegetation that increases stormwater infiltration and reduces pollution. Review and update landscaping recommendations/ requirements in local ordinances to provide regulatory incentives that encourage native landscapes.	Med	MUNIC, CB, *GLNTC*	SMC, FOCR, NIPC, USFWS, NRCS, SWCD	
3	Replace turf in road R-O-Ws with native vegetation to reduce and filter runoff and provide habitat benefits.	Med	IDOT, ISTHA, LCDOT, MUNIC,	SWCD, SMC, NIPC, USFWS	
6	Identify demonstration sites for application of water quality filters (sand or otherwise).	High	FOCR, SMC, SWCD	MUNIC, NIPC, *GLNTC*	

Objective 2: Reduce streambank and streambed erosion. Stabilize all severely eroded stream reaches by the year 2005 and all moderately eroded reaches by 2010.

13	Set up one or more public demonstration sites for native streambank vegetation restoration and management, and where feasible, replace non-native invasive plant species along stream channels and banks with deep-rooted native plants.	High	ESDD, WSDD, UDDWF	MUNIC, LCFPD, PD, USFWS, NRCS, SWCD, *GLNTC*	
14	Stabilize eroded streambanks and tributary swale/gullies using appropriate soil bio-engineering techniques.	High	ESDD, WSDD, UDDWF	SMC, FPD, PD, NRCS, *GLNTC*, *Property owners*	

1 See Table 5-1 for a list of organization abbreviations. Italics = property owner.

Goal: Reduce flood damage in the North Branch of the Chicago River watershed.

Objectives 1: Reduce flow rates and volumes from existing developed areas and prevent increases from new development.

No.	Action Recommendation	Priority	Lead Agencies/ *Owner*[1]	Supporting Agencies/ *Owner*[1]	Target Date
20	Reduce allowable release rates from new developments and redeveloped sites in the North Branch Watershed to .10 cfs per acre for the 100 year 24 hour storm event.	High	SMC	MUNIC, *GLNTC*	
23	Disconnect roof-top runoff from the stormsewer system wherever possible in new developments and in existing developed areas. Reduce drainage assessment or offer rebate for properties with disconnected rooftops.	High	*Property owners*, MUNIC, ESDD, WSDD, UDDWF, *GLNTC*	SMC, NIPC, FOCR, TWP	
24	Educate residents and businesses and provide cost-share incentives to install infiltration trenches or basins where soil conditions are favorable to collect rooftop, driveway and parking lot runoff. Identify demonstration sites appropriate for application of infiltration devices, and permeable paving block or porous pavement.	Med	FOCR, SMC	NIPC, MUNIC, SWCD, LCHB, *GLNTC*	

1 See Table 5-1 for a list of organization abbreviations. Italics = property owner.

Objective 2: Protect and restore floodplain functions.

No.	Action Recommendation	Priority	Lead Agencies/ *Owner*[1]	Supporting Agencies/ *Owner*[1]	Target Date
26	Buyout repetitively flooded properties in floodplains and relocate or demolish buildings to restore floodplain function.	High	SMC	CB, MUNIC, *GLNTC*	
29	Protect wetlands and floodplains using land use management techniques such as a special zoning classification and/or more stringent restrictions on floodplain development in the WDO.	Med	SMC, MUNIC, LCP&D, *GLNTC*		

Objective 3: Maintain and manage the river corridor and other drainageways to preserve conveyance of stormwater and minimize the potential for debris blockages and other obstructions in an environmentally-friendly manner.

No.	Action Recommendation	Priority	Lead Agencies/ *Owner*[1]	Supporting Agencies/ *Owner*[1]	Target Date
30	Remove large debris blockages that are obstructing drainage ways.	High	ESDD, WSDD, UDDWF, SMC	*LCFPD*, MUNIC, *GLNTC*	
32	Adopt a schedule for regular maintenance of hydraulic structures such as bridges and culverts to prevent sediment and debris blockages.	High	MUNIC, ESDD, WSDD, UDDWF, LCDOT, TWPHD, IDOT, ISTHA	*LCFPD*, PD, *GLNTC*	

1 See Table 5-1 for a list of organization abbreviations. Italics = property owner.

Objective 4: Mitigate flood damage using property protection measures.

No.	Action Recommendation	Priority	Lead Agencies/ *Owner* [1]	Supporting Agencies/ *Owner* [1]	Target Date
34	Identify individual addresses of buildings at risk of flooding (located within the 100 year floodplain and/or in flood hazard areas identified in the Lake County Flood Hazard Mitigation Plan). Survey buildings to determine first floor and adjacent grade elevations to identify the actual structures at risk of flooding. Prioritize buildings at greatest risk of flood damage. Coordinate a bi-annual flood hazard notification program for owners of buildings at risk of flooding that includes information on flood hazard mitigation with a survey to identify candidates for flood mitigation activities.	High	MUNIC, SMC	LCEMA, FEMA, IEMA, *GLNTC*	
35	Provide technical assistance to property owners in high priority flood prone areas to use wet/dry floodproofing, building elevation and other approved measures to reduce flood losses. Identify cost-share funds for these practices.	Med	MUNIC, LCP&D	IDNR, IEMA, *GLNTC*	
36	Develop sources for combined county and municipal cost share fund to meet local match requirements for acquisition or relocation of flood prone buildings.	Med	SMC, LCP&D, MUNIC	FEMA, IEMA, *GLNTC*	

1 See Table 5-1 for a list of organization abbreviations. Italics = property owner.

Goal: Protect and restore natural resources and provide associated recreational opportunities.

Objective 1: Protect and restore wetlands and streams to achieve no-net-loss in functionality, quantity and quality of wetland acres by the year 2000, and a net gain by the year 2004.

No.	Action Recommendation	Priority	Lead Agencies/ *Owner*[1]	Supporting Agencies/ *Owner*[1]	Target Date
42	Replace turfgrass around detention ponds and other wetlands with native plant buffers to provide wildlife habitat and discourage nuisance geese.	Med	MUNIC, SMC, *GLNTC*, *Homeowners Assn.*	FOCR, NIPC, USFWS, NRCS, SWCD	
47	Adopt a policy of no-net-loss of wetlands with this watershed plan and incorporate this policy in all municipal and county land use plans and regulatory programs.	High	SMC, MUNIC, CB, *GLNTC*	USACE, USFWS, SWCD, NRCS	

Objective 3: Protect and enhance biodiversity in plant communities and animal populations that includes no-net-loss of threatened and endangered species or designated Illinois Natural Areas and Nature Preserves.

No.	Action Recommendation	Priority	Lead Agencies/ *Owner*[1]	Supporting Agencies/ *Owner*[1]	Target Date
56	Use native vegetation extensively in BMPs to enhance wildlife habitat.	Med	MUNIC, LCP&D, *GLNTC*, *Developers*	USFWS, LCHB, ESDD, WSDD, UDDWF, SMC, NIPC, NRCS, SWCD	

1 See Table 5-1 for a list of organization abbreviations. Italics = property owner.

Objective 4: Identify and develop opportunities for river-based recreation such as hiking, fishing, canoeing, running and biking.

No.	Action Recommendation	Priority	Lead Agencies/ *Owner*[1]	Supporting Agencies/*Owner*[1]	Target Date
61	Develop partnership with municipalities, park districts, schools and forest preserve district to prioritize and coordinate implementation of Northeasern Illinois greenways and trails recommendations.	High	NIPC, OL, IDNR	LCFPD, SMC, LCDOT, LFOLA, LBOLA, TWP, PD, MUNIC, *GLNTC*	

1 See Table 5-1 for a list of organization abbreviations. Italics = property owner.

Flood Mitigation Sites

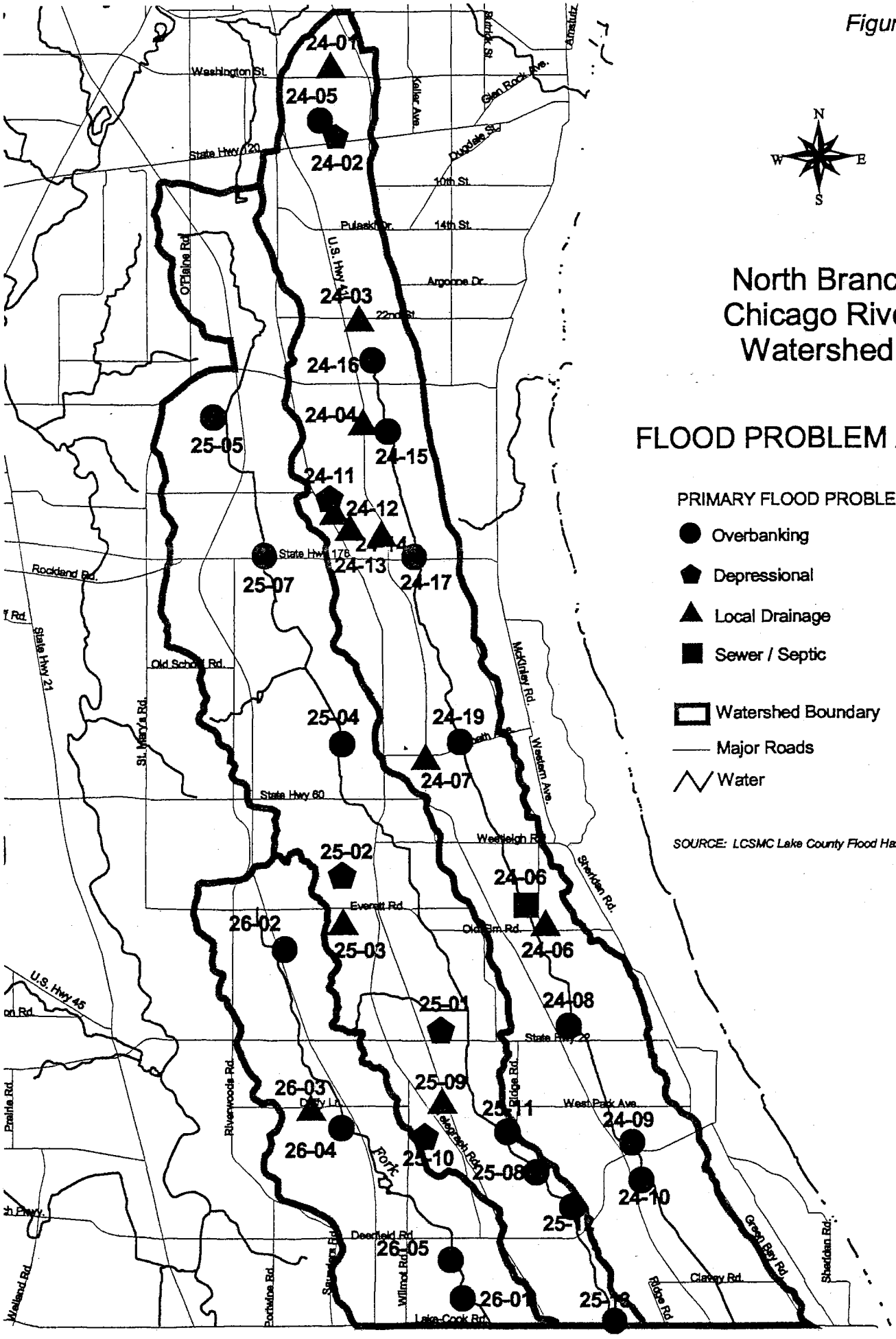
(Note: Flood Problem Area reference numbers were developed for the Lake County Flood Hazard Mitigation Plan. Two additional sites were identified during the watershed planning process. See Figure 2-64 for mapped locations.)

Skokie River

Ref. No.	Location/ Flood Problem Area	Existing Condition	Action Recommendations	Priority	Lead Agencies / *Owner*[2]	Supporting Agencies[2]	Target Date
216	**24-3**, MLK, Jr. Drive East of 41, N. Chicago	Local drainage, overbank flooding	Refer to LCDOT 5-yr. plan. Incls. widening, elevation & detention. Investigate potential detention sites at Foss Park Golf Course and on vacant property between Foss Park Golf Course and Greenbelt Forest Preserve.	High	N. Chicago, *Foss Park District*	*Gillette, LCFPD,* ESDD, *Abbott, Com Ed, GLNTC*	
217	**24-15, 24-16**, Great Lakes Naval Training Command	Overbank flooding on golf course, housing in floodplain	Continue to provide civilian personnel with technical assistance and map products. Perform stream maintenance activities on an annual basis to include debris and sediment removal. Provide additional depressional storage north of Hwy. 137 on golf course.	Low	*GLNTC*	DD	

1 SSS = stormsewershed
2 See Table 5- for a list of organization abbreviations. Italics = "site owner".

Figure No. 2-64



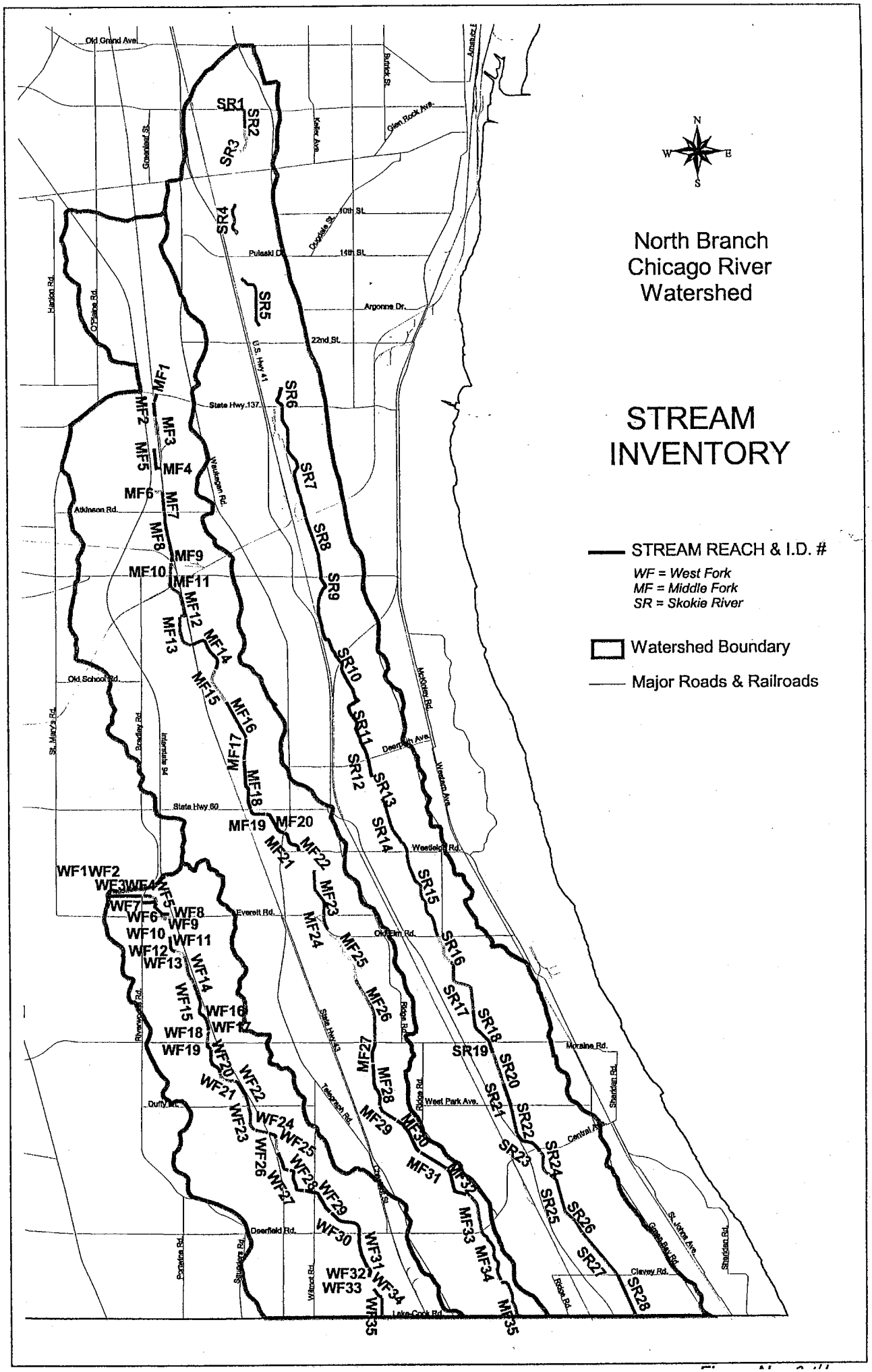
Hydraulic Structures *[See Hydraulic Structure Summary Appendix F.]*

(Note: Location refers to the stream reach and hydraulic structure reference numbers. Only the most significant problems are listed in the action plan. Lower priority problems are noted in the complete summary in Appendix F.)

Skokie River

Ref. No.	Location/ Flood Problem Area	Existing Condition	Action Recommendations	Priority	Lead Agencies / *Owner*[2]	Supporting Agencies[2]	Target Date
204	**SR6** HS-86/87, 465 ft. downstream from beginning of reach, N. Chicago	East culvert of double culvert blocked with debris.	Clean out debris and put on regular maintenance schedule.	High	ESDD, GLNTC	N. Chicago	
205	**SR7** HS-97/98/99, Virginia Ave., GLNTC	Middle culvert is blocked with debris.	Clean out debris and put on regular maintenance schedule.	High	ESDD, GLNTC	N. Chicago	
206	**SR7** HS-91/92, 275 feet downstream from beginning of reach, GLNTC	West culvert is blocked by debris.	Clean out debris and put on regular maintenance schedule.	High	ESDD, GLNTC	N. Chicago	
207	**SR7** HS-94, 825 feet downstream from the beginning of reach, GLNTC	Culvert collapsed to 2 feet.	Replace culvert.	High	ESDD, GLNTC	N. Chicago	

1 SSS = stormsewershed
2 See Table 5- for a list of organization abbreviations. Italics = "site owner".


North Branch
Chicago River
Watershed
STREAM
INVENTORY
STREAM REACH & I.D. #
WF = West Fork
MF = Middle Fork
SR = Skokie River
Watershed Boundary
Major Roads & Railroads
N
S
E
W
Old Grand Ave.
Glen Rock Ave.
10th St.
14th St.
Pulaski Dr.
Argonne Dr.
22nd St.
U.S. Hwy 41
State Hwy 137
Atkinson Rd.
Old School Rd.
State Hwy 60
Deerfield Rd.
Lake Cook Rd.
Clavey Rd.
Moraine Rd.
West Park Ave.
Central Ave.
Everett Rd.
Old Elm Rd.
Westleigh Rd.
Dundee Rd.
Wilmot Rd.
Skokie Blvd.
Sheridan Rd.
Green Bay Rd.
St. Joyce Ave.
Ridge Rd.
Western Ave.
McKinley Rd.
Telegraph Rd.
Interstate 94
Waukegan Rd.
Dundee Rd.
Edens Exp.
Harlem Ave.
Cicero Ave.
Keeler Ave.
Kedzie Ave.
Central Park Ave.
Grandiest St.
Hamlin Rd.
O'Plaine Rd.
St. Mary's Rd.
Rand Rd.
Riverwoods Rd.
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Outfall Retrofits/Repairs *[See Point Discharge Summary Appendix E.]*

(Note: Location refers to the stream reach and the point discharge reference numbers. See Figure 2-41 for stream reach location. Because of the large number of discharge points with associated problems, only the most significant are listed in this action plan. Lower priority problems that need to be corrected are found in the complete summary.)

Skokie River

No.	Location	Action Recommendation	Priority	Lead Agencies[2]	Supporting Agencies[2]	Target Date
1	North Chicago SR6 - #580, 581	Repair/replace failed pipes and determine if they can be retrofitted.	Med	ESDD, *GLNTC*		
2	North Chicago SR7 - #611	Repair severe swale/gully erosion caused by collapsed stormsewer and determine if potential retrofit.	High	ESDD, *GLNTC*		
3	North Chicago SR7 - # 592, 596, 598, 599, 602, 603, 604, 607, 613	Correct moderate streambank erosion caused by pipe outfalls (592, 596, 598, 602, 603, 604, 613) and swale/gully (607). Identify opportunities for retrofits. Clear garbage from pipe outfall (599).	Med	ESDD, *GLNTC*		

Potential Wetland Restoration Sites

(Note: See Figure 5-3 for locations. Potential wetland restoration sites were identified based on map analysis. Restoration feasibility still to be determined.)

Skokie River

No.	Location	Action Recommendation	Priority	Lead Agencies/ *Owners*[2]	Supporting Agencies/ *Owners*[2]	Target Date
133	**WL3:** Great Lakes Naval Golf Course. NW US 41 and IL 137	Determine wetland restoration feasibility in floodplain of Skokie on Great Lakes Naval Training Center Golf Course.	Med	SMC, *GLNTC*	USFWS, NRCS	

1 SSS = stormsewershed
2 See Table 5- for a list of organization abbreviations. Italics = "site owner".

5.1 WATERSHED ROLES & RESPONSIBILITIES

Table 5-1
NORTH BRANCH OF THE CHICAGO RIVER WATERSHED PARTNERS, LAKE COUNTY

Watershed Partner	Abbreviation
Chicago Botanic Garden	CBG
Corporate Landowners	Corp
Deerfield Wastewater Treatment Plant	DWWTP
Drainage Districts	DD
Federal Emergency Management Agency	FEMA
Friends of Chicago River	FOCR
Great Lakes Naval Training Center	GLNTC
Golf Courses	Golf
Home Builders Association of Lake County	HBALC
Illinois Department of Natural Resources	IDNR
Illinois Department of Transportation	IDOT
Illinois Emergency Management Agency	IEMA
Illinois Environmental Protection Agency	IEPA
Illinois State Toll Highway Authority	ISTHA
Lake Bluff Open Lands Assoc.	LBOLA
LC Board	CB
LC Department of Transportation	LCDOT
LC Emergency Management Agency	LCEMA
LC Forest Preserve District	FPD
LC Health Department	LCHD
LC Planning & Development Department	P&D
LC Soil & Water Conservation District	SWCD
LC Stormwater Management Commission	SMC
Lake Forest Open Lands Assoc.	LFOLA
Libertyville Township	LTWP
Metropolitan Water Reclamation District	MWRD
Municipalities	MUNIC
North Branch Planning Committee/ Watershed Management Board	NBPC/WMB
North Shore Sanitary District	NSSD
Northeastern Illinois Plan Commission	NIPC
Openlands Project	OP
Park Districts	PD
Residents	Residents
Townships	TWP
US Army Corps of Engineers	USACE
US Fish & Wildlife Service	USFWS
USDA Natural Resources Conservation Service	NRCS

Chicago Botanic Garden

The Chicago Botanic Garden is located on the Skokie River immediately south of Lake County (south side of Lake–Cook Road). The Botanic Garden did an extensive stream restoration on the Skokie River running through their property including wetland restoration, streambank stabilization, low flow meandering, pool/riffle development and native prairie plantings in the floodplain. A video was produced documenting the procedures used in the stream restoration and the Garden continues to monitor the success of the best management practices used. The Botanic Garden is currently undertaking an extensive initiative to monitor water quality and stabilize eroded shoreline surrounding the lagoons at the Garden.

The Botanic Garden offers many educational programs for the general public and professionals, and could take a more active educational role in the watershed sharing their experiences and training watershed municipalities on the techniques that have been used successfully at the Garden. A representative of the Botanic Garden has participated on the NBPC, and the Garden has hosted a

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