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MARSHFIELD MUNICIPAL AIRPORT GEORGE HARLOW FIELD

ENVIRONMENTAL ASSESSMENT

EXTENSION OF EXISTING AIRPORT WILDLIFE MANAGEMENT / PERIMETER FENCE

March 2021

File No. 15.0166669.01



PREPARED FOR:

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Environmental Assessment

Extension of Existing Airport Wildlife Management / Perimeter Fence
Marshfield Municipal Airport, George Harlow Field
Marshfield, Massachusetts

This Environmental Assessment (EA) evaluates the impacts of improving safety and security at Marshfield Municipal Airport (Airport) in Massachusetts. The Airport proposed to extend to an Existing Airport Wildlife Management / Perimeter Fence to fully enclose the Airport to prevent hazard-posing wildlife from entering areas of the Airport where aircraft and animal collisions may occur. Chain-link fencing is currently established along the northwestern and southeastern extents of the runway. There is currently no fencing present at either end of the runway to the northeast (RW 24) and to the southwest (RW 6). The proposed fence would occur primarily on Airport property except in two locations: the southwest corner which is land owned by the Town of Marshfield; and the northeast corner which is owned by Massachusetts Audubon. The Airport and the Marshfield Conservation Commission have entered into a Memorandum of Understanding (MOU) to allow for fence installation and maintenance on the Town property and the Airport is in agreement with the Massachusetts Audubon Society to allow for fencing within the existing avigation easement.

FINDING of NO SIGNIFICANT IMPACT (FONSI)

After careful and thorough consideration of the facts contained herein, the undersigned finds that the proposed Federal action is consistent with existing national environmental policies and objectives as set forth in section 101 of the National Environmental Policy Act (NEPA) and other applicable environmental requirements and will not significantly affect the quality of the human environment or otherwise include any condition requiring consultation pursuant to section 102 (2) (C) of NEPA.

APPROVED:

Printed Name

Signature

Date

LEGAL NOTICE

MARSHFIELD MUNICIPAL AIRPORT

ENVIRONMENTAL ASSESSMENT

The Marshfield Airport Commission, in conjunction with the Federal Aviation Administration and the Massachusetts Aeronautics Division, has completed a draft Environmental Assessment for airport improvements at Marshfield Municipal Airport. Copies of the document are available for public review on the airport's website (<https://www.marshfield-ma.gov/marshfield-airport-home>). Comments are due by [Date] and may be submitted to Richard P. Doucette, Federal Aviation Administration 1200 District Avenue Burlington MA 01803.

Robert Reilly, Chairman

Marshfield Airport Commission

**PUBLISHED [Date] IN THE
PATRIOT LEDGER - TEAR SHEET
TO BE INSERTED INTO FINAL
EA AFTER PUBLIC COMMENT
PERIOD**



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1.0 EXECUTIVE SUMMARY

The Marshfield Municipal Airport-George Harlow Field (Airport) and the Federal Aviation Administration (FAA) are proposing to extend to an Existing Airport Wildlife Management / Perimeter Fence to fully enclose the Airport to prevent hazard-posing wildlife from entering areas of the Airport where aircraft and animal collisions may occur. Chain-link fencing is currently established along the northwestern and southeastern extents of the runway. It extends outside the runway safety area along most of its length. There is currently no fencing present at either end of the runway to the northeast (RW 24) and to the southwest (RW 6) which also includes vegetated wetland areas. The proposed fence would occur entirely on Airport property except in two locations: the southwest corner which is land owned by the Town of Marshfield; and the northeast corner which is owned by Massachusetts Audubon (see Plan Sheet NOI.2 in Appendix B). The Airport and the Marshfield Conservation Commission (Commission) have entered into a Memorandum of Understanding (MOU) to allow for fence installation and maintenance on the Town property and the Airport has completed an easement with the Massachusetts Audubon Society to allow for fencing within the existing aviation easement.

On August 03, 2016, the FAA issued National Part 139 CertAlert No. 16-03¹ which provided guidance and recommendations to airports across the United States on airfield exclusion methods for deer and other large mammals and ground birds. The FAA concluded that the most effective measure to limit potential deer and other large mammal strikes is to establish a continuous line of 8-10' tall fencing topped with 3-strand barbed wire.

The FAA states in National Part 139 CertAlert No. 16-03:

“Elevated deer and coyote populations in the United States represent an increasingly serious threat to both Commercial and General Aviation Aircraft. According to the National Wildlife Strike Database, deer and coyote are the most frequently struck terrestrial mammals (37 and 34 percent, respectively). Deer are responsible for 92 percent of the mammal strikes that resulted in damage. From 1990 to 2015, over 1,107 deer-aircraft collisions and 487 coyote-aircraft collisions were reported to the Federal Aviation Administration (FAA). Of these reports, 932 of the deer strikes (84%) and 43 of the coyote strikes (9%) indicated the aircraft was damaged as a result of the collision.

The FAA reminds airport operators that controlling deer and other medium to large terrestrial mammals on and around airfields is very important. Two recent incidents include a Cessna 195B sustaining significant damage on landing as a result of veering off the runway to avoid striking white-tailed deer in Virginia and a Cessna 310 that was destroyed on approach to an airport in Michigan when it collided with a white-tailed deer.”

A Wildlife Hazard Assessment was finalized in March 2020 which identified hazards at the Airport and steps which could be taken to ensure that aircraft and wildlife collisions are prevented. The main recommendation of the report was to install exclusionary fencing around the entire airport, 8 to 10-feet tall with 3-strand barbed wire.

The Proposed Action therefore involves the installation of new segments of perimeter fencing to prevent large mammals from entering the runway, taxiway, and areas around the terminal building and T-hangers. Fencing has already been installed northwest of the runway near the end of Bass Creek to just past Runway 6 at the end of Gratto Rd. to the southeast of the runway the fence runs the entire length of the runway in parallel.

¹ FAAx National Part 139 CertAlert No. 16-03. US DOT: FAA. Effective Date 8/03/2016.



The Proposed Action will fulfill the purpose and need of the project to exclude hazardous wildlife from areas where aircraft may be operating. The new fencing will be installed at each end of the runway and will be linked to the existing fence completely encapsulating the Airport.

The proposed fencing installation will result in approximately 96 SF of permanent impacts to vegetated wetlands. The installation of the turtle gates will result in approximately 80 SF of permanent impacts to vegetated, these are being installed to ensure that the state-listed species (special concern) Eastern Box Turtle (*Terrapene carolina*) can pass unimpeded through the fence while prohibiting larger species such as coyote and white-tailed deer.

Coastal Zone Management consistency review is required for projects that: 1) are in, or can reasonably be expected to, affect the resources or land or water uses of the coastal zone; and, 2) require a federal license or permit, are federally funded or are a direct activity of a federal agency. Federal licensing was required for this project and federal funding is being provided; therefore, coordination with CZMA is required and in process (submission was simultaneous with the publication of this EA, see Appendix C)

In accordance with Chapter 505-10 (F) of the Marshfield Wetlands Bylaw (Bylaw), mitigation in kind for alterations within wetland resource areas will be performed as set forth in 310 CMR 10.55(4)(b). The Massachusetts Wetlands Protection Act (Act) and the Bylaw require the loss of vegetated wetlands to be replaced if unavoidable. FAA setbacks required that the fence sections be installed in vegetated wetlands in some areas around the Airport. The replacement of the lost wetlands will occur on Airport owned property. The mitigation area referenced as Wetland Creation Area (Appendix B) accounts for a >5:1 replacement for vegetated wetland loss associated with the Proposed Action. It will create a 500+ SF shelf of new vegetated wetland by the removal of up to 1 foot of upland soils and creation of wetlands at equal grade to existing wetlands adjacent to it. The final result of the creation will be a herbaceous to shrub-dominated wetland system.

The current Massachusetts National Heritage & Endangered Species Program (MA NHESP) Priority Habitat mapping depicts that portions of the proposed work areas are within mapped rare species habitat (Appendix A, Figure 4). The Proposed Action proposes minor tree clearing. In total 4,000 SF (0.09 ac) of trees will be removed, approximately an area 200 feet x 20 feet. In order to mitigate for impacts to the turtles, tree removal will be completed by October 15 or will occur the following spring. All on-site activity will be supervised by a MA NHESP approved turtle biologist. Mitigation for impacts to the Eastern Box Turtle include that the proposed fence will have turtle gates at interval to provide access. Slash piles from the cut trees will be left along the new tree line of coarse woody debris to serve as refuge and cover. Conservation funding will be provided to compensate for the loss of overwintering habitat.

An archaeological survey was performed prior to the Runway Extension and Realignment Project in 2013-2014. The review indicated that further onsite investigations were warranted. This survey resulted in the discovery of numerous artifacts, stemming from up to 10,000 years ago to the colonial period. Excavations took place at that time and thousands of artifacts were recovered and cataloged. A Public Archeology Laboratory, Inc (PAL) archeologist performed such a survey and prepared a Technical Report in January 2020 entitled Intensive Archaeological Survey and Supplemental Site Examination Marshfield Municipal Airport-George Harlow Field Right-of-Way Easement Acquisition and Perimeter Fence Project (see Appendix F). This report details the history of the Site, the most recent on-site survey, and conclusionary statements concerning the Proposed Action. No mitigation is necessary.

2.0 INTRODUCTION

The National Environmental Policy Act (NEPA) of 1969 is a key piece of federal legislation designed to raise environmental awareness. It requires federal agencies proposing major actions to fully consider the impacts a project would have on the



natural and social environment before capital improvement projects are funded. It requires federal interagency coordination and calls for public involvement in the planning and environmental review process. The Federal Aviation Administration (FAA) complies with and supports both the policies and procedures of NEPA.

Any project involving action by the federal government that could significantly affect the environment requires a federal environmental determination. To address compliance with NEPA and the Council on Environmental Quality (CEQ) regulations (40 CFR 1500-1508) in airport development, FAA developed and issued Order 1050.1F² (eff. Date 7/16/2015): Environmental Impacts: Policies and Procedures, and Order 5050.4B³ (4/28/2006): Implementing Instructions for Airport Actions. These documents identify three project categories as defined in the FAA's Order 1050.1F:

- Actions which are Categorically Excluded (CATEX);
"Categorically Excluded Actions. A CATEX refers to a category of actions that do not individually or cumulatively have a significant effect on the human environment, and for which, neither an EA nor an EIS is required."
- Actions requiring an Environmental Assessment (EA); and
"Actions Normally Requiring an Environmental Assessment. The purpose of an EA is to determine whether a proposed action has the potential to significantly affect the human environment. An EA is a concise public document that briefly provides sufficient evidence and analysis for determining whether to prepare an EIS or a FONSI."
- Actions requiring an Environmental Impact Statement (EIS).
Actions Normally Requiring an Environmental Impact Statement. Under NEPA, the FAA must prepare an EIS for actions significantly affecting the quality of the human environment. An EIS is a detailed written statement required under Section 102(2)(C) of NEPA when one or more environmental impacts would be significant and mitigation measures cannot reduce the impact(s) below significant levels. Direct, indirect, and cumulative impacts must be considered when determining significance.

The Airport has evaluated the environmental effects of extending a wildlife fence to fully enclose the airfield with a wildlife deterrent fence, and to purchase easements on properties of sufficient size to fit portions of the fence additions in.

There are several types of airport-specific actions that pertain to the proposed activity that are determined to be CATEX and listed in FAA Order 1050.1F. The acquisition of land for the current off-site fence alignment is categorically excluded as long as the fence is categorically excluded per Section 5-6.4(b), "Acquisition of land and relocation associated with categorically excluded action."

According to Section 5-6.4(f), the construction of fence lines may be determined to be CATEX.

"Federal financial assistance, licensing, Airport Layout Plan (ALP) approval, or FAA construction or limited expansion of accessory on-site structures, including storage buildings, garages, hangars, t-hangars, small parking areas, signs, fences, and other essentially similar minor development items."

When determining whether a proposed action is categorically excluded, extraordinary circumstances must be considered. Extraordinary circumstances for airport actions are listed in Section 5-2 of FAA Order 1050.1F. This section discusses and

² FAAx. Environmental Impacts: Policies and Procedures. US DOT: FAA. Effective Date 7/16/2015.

³ FAAx National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions. US DOT: FAA. Effective Date April 28, 2006



includes any impact on natural, ecological or scenic resources of Federal, tribal, State or local significance that will trigger an extraordinary significance.

“An impact involving one or more of the circumstances described below in connection with a proposed action does not require the preparation of an EA or EIS unless the additional determination is made that the proposed action may have a significant environmental impact (i.e., that the circumstances rise to the level of extraordinary circumstances). The FAA uses screening and other analyses and consultation, as appropriate, to assist in determining extraordinary circumstances....When extraordinary circumstances exist and the proposed action cannot be modified to eliminate the extraordinary circumstances, an EA or EIS must be prepared. If extraordinary circumstances do not exist or are eliminated, a CATEX may be used.

The following extraordinary circumstances exist for the proposed action which requires that an environmental assessment be authored under “Section 5-2 Extraordinary Circumstances”:

“(3) An impact on natural, ecological, or scenic resources of Federal, state, tribal, or local significance (e.g., federally listed or proposed endangered, threatened, or candidate species, or designated or proposed critical habitat under the Endangered Species Act, 16 U.S.C. §§ 1531-1544);”

“(4) An impact on the following resources: resources protected by the Fish and Wildlife Coordination Act, 16 U.S.C. §§ 661-667d; wetlands; floodplains; coastal zones; national marine sanctuaries; wilderness areas; National Resource Conservation Service-designated prime and unique farmlands; energy supply and natural resources; resources protected under the Wild and Scenic Rivers Act, 16 U.S.C. §§ 1271-1287, and rivers or river segments listed on the Nationwide Rivers Inventory (NRI); and solid waste management.”

Although Section 5-6.4(f) states that minor fences are categorically excluded, the Proposed Action may be considered to have “extraordinary circumstances” because of its proposed location with State-protected species habitat and wetlands; therefore, an EA has been prepared.

3.0 PURPOSE AND NEED

The purpose of the Proposed Action is to reduce the potential for animal strikes by aircraft utilizing the facility. Chain-link fencing is currently established along the northwestern and southeastern extents of the runway and it extends outside the runway safety area along the majority of its length. There is currently no fencing present at either end of the runway to the northeast (RW 24) and to the southwest (RW 6) which also includes vegetated areas in these areas. Sections of older fencing present along the northwestern portion of the Airport located near the administrative building and western T-hangers are in disrepair and need to be replaced. Completion of the Proposed Action will significantly reduce the potential for animal strikes by aircraft at the subject facility.

On August 03, 2016, the Federal Aviation Administration (FAA) issued “National Part 139 CertAlert No. 16-03” which provided guidance and recommendations to airports across the United States on airfield exclusion methods for deer and other large mammals. The FAA concluded that the most effective measure to limit potential deer and other large mammal strikes is to establish a continuous fence line of 8-10’ tall fencing topped with 3-strand barbed wire. Between January 1990 and August 2018, a total of four wildlife strikes were reported at the Airport. A summary of the FAA National Wildlife Strike Database for the Airport is presented in the following table.



Table 1. Wildlife Strikes Reported from January 1990 through August 2018 (FAA Wildlife Strike Database)*

Date	Type of Service/ Aircraft	Number/ Species	Damage	Flight Phase	Comments
4/11/1993: Daytime	Privately owned / C-310	Unknown bird – medium	Minor	Climb, Runway not identified	Completed flight to PVD, Struck and damaged #1 engine, cowling and propeller governor.
5/4/2009 Daytime strike, approx. 1640 hrs	Privately owned / PA-46 Malibu	Unknown bird – medium	Minor; total cost ~\$1,700	Take-off run, Runway 6	Precautionary landing at GHG. Damage to wing root fairing. Required replacement of fiberglass fairing.
7/23/18 Daytime strike, approx. 0905 hrs	Business / C-560	Unknown bird	None	Departure, Runway not identified	Precautionary landing at GHG. No damage noted.
7/26/18 Daytime strike, approx. 0848 hrs	Business / C-414	Mourning dove	None	Climb, approximately 2 ft above ground Runway 24	Likely multiple birds struck windshield, nose and fuselage. No damage noted but aircraft required exterior cleaning.
* Two separate near misses with eastern coyote and white-tailed deer were also recorded at the Airport.					

Between 2017 and 2018, Epsilon Associates, Inc. on behalf of the Airport, prepared a Wildlife Hazard Assessment (WHA) in accordance with Federal Aviation Regulation “FAR” Part 139 guidelines, which identified the need for the Airport to conduct the assessment. The WHA identified approximately 91 species of birds, 15 species of mammals and two species of reptiles on or within 10,000 feet of the Airport. Of the animal species observed, the WHA indicated that the species observed that pose the greatest potential threat to the safety of aircraft utilizing the Airport include white-tailed deer (*Odocoileus virginianus*), eastern coyote (*Canis latrans*), and wild turkey (*Meleagris gallopavo*).

Wildlife control measures currently being conducted at the Airport include: turf management, habitat modification, vehicular harassment, pyrotechnics and depredation. Wildlife control measures are performed by Airport personnel during airfield checks and normal field operations. Wildlife control also occurs as-needed based upon pilot observation or request. Personnel are involved in identifying and mitigating potential hazards and vegetation management. The Airport is patrolled each day to proactively identify new wildlife hazards. Runway sweeps occur prior to the initial flight of each day and as necessary. Vehicle harassment is the primary method for dispersing wildlife. The Airport holds the appropriate State and Federal depredation permits for migratory birds and mammals to remove wildlife once harassment is no longer effective and there is a direct hazard to human safety.

The WHA recommends that the most effective long-term control measure to reduce potential strikes by larger mammals and/or ground birds is a wildlife fence that encloses the entire Airport. As previously mentioned, only portions of the



Airport are enclosed by a chain-link wildlife and/or security fencing. Based on the recommendations of the FAA and the WHA, the Airport proposes to install chain-link wildlife deterrent fencing in the unfenced areas to more fully enclose the Airport and limit any potential animal strikes (Appendix B).

Originally, a bridge was proposed during conceptualization of the project to allow access by the Airport to points west of Green Harbor River. The intent of the bridge was to provide access by Airport personnel and future contractors to maintain Vegetation Management Plan areas of tree removal and to allow access by town emergency services in cases where fire and rescue may be necessary. Due in part to the sinuosity of the Green Harbor River, a feasible location for the bridge to be sited was difficult to select. Ultimately a vehicle bridge with concrete piers and a span exceeding eighty (80) feet would be required at a cost approaching \$4 Million. This increased the projected cost outside of conceptualized budget at the onset of the project. Further, permitting difficulties were also predicted as there are access points to the areas west of the Green Harbor River without requiring a new bridge. An access road from the runway on the 6-End would have also been required to be installed to the bridge which also posed permitting hurdles. The bridge would have also increased permanent wetland impacts to the point that a variance from the Wetland Protection Act was likely. For these reasons, the bridge concept was dropped from the Proposed Action and has been shelved.

4.0 PUBLIC INVOLVEMENT

Per FAA Order 1050.1F 6-2.1i(3)

“A summary of public involvement, including evidence of the opportunity for a public hearing, if required under applicable Federal laws (e.g., the Airport and Airway Improvement Act of 1982, 49 U.S.C. § 47106(c)), regulations, and orders, and a summary of issues raised at any public hearing or public meeting as well as responses to substantive comments.”

Environmental Order and FAA Order 1050.1F requires an opportunity for public involvement in EAs. A public meeting is often held either as a stand-alone meeting or as an agenda item on an Airport Commission or other appropriate body. It is best to scale the type /amount of public involvement to the complexity or controversy of the project. It is asked that public comment/input relevant to the project. Public involvement ensures that major or minor changes occurring as a result of a project are described to the public to incorporate scientific or laymen concerns that may exist over whether an impact was evaluated enough, and the EA was comprehensive enough to ensure the topics in FAA Order 1050.1F have been addressed.

Chapter 4 of FAA Order 5050.4b states:

401. FAA’S COMMUNITY INVOLVEMENT POLICY. FAA has a community involvement policy (FAA-EE-90-03, August 1990). That policy recognizes community involvement as an essential part of FAA programs and decisions. ARP, like each FAA office, must incorporate open, effective community involvement to achieve the following goals and tasks.

- a. Provide active, early, and continuous public involvement and reasonable public access to information that accurately describes a proposed project and its environmental effects.
- b. Ask for and consider public input on plans, proposals, alternatives, impacts, and mitigation.
- c. Use public involvement techniques designed to meet the needs of different interest groups and individuals.
- d. Promote an active public role to lessen potentially adverse community reaction to agency actions needed for safe, efficient aviation.



This document will be publicly displayed and available for comment on the Airport’s website (<https://www.marshfield-ma.gov/marshfield-airport-home>). Future comments from the public or agency stakeholders will be incorporated into the Project. A public hearing was held with the Marshfield Conservation Commisison on October 6, 2020 where the project was presented to the Commisison and the public via a publicly available Zoom meeting, available on the Marshfield Conservation Commission website.

5.0 FEDERAL, STATE AND LOCAL AGENCY JURISDICTION

The proposed project requires coordination with several state and federal resource agencies and permitting associated with resource impacts as listed in Table 2.

Table 2. Agency Coordination*

Agency	Resource	Regulatory Authority	Potential Permit
US Army Corps of Engineers (US ACOE)	Freshwater Wetlands	33 U.S.C §§ 1251 et seq. (aka Section 404 of the CWA)	Section 404 Self Verification (SV) under a General Permit for Work within Freshwater Wetlands (Submitted Simultaneously with this Document)
Massachusetts Office of Coastal Zone Management	Coastal Zone	16 U.S.C. §§ 1451–1464	Federal Consistency Statement
Massachusetts Natural Heritage and Endangered Species Program	Rare and Endangered Species	M.G.L. c. 131A (321 CMR 10.00: Massachusetts Endangered Species Act)	Amendment to Previously Authorized Conservation Management Permit
Town of Marshfield, MA	Any Impacts to Freshwater Wetlands	MGL c. 131 § 40 (310 CMR 10.00 Wetlands Protection Act) MGB (Chapter 505)	NOI Order of Conditions (Received October 2020)
* United States Code (USC), Clean Water Act (CWA), Massachusetts General Laws (MGL), Code of Massachusetts Regulation (CMR), Marshfield General Bylaws (MGB).			



6.0 BACKGROUND AND AIRPORT SETTING

The Town of Marshfield is located in central southeastern Massachusetts in Plymouth County. Marshfield Municipal Airport, known as the George D. Harlow Field or GHG, is a municipally owned public-use general aviation airport owned and operated by the Town of Marshfield through the Marshfield Airport Commission. Shoreline Aviation, the fixed base operator (FBO), manages the airfield. The Airport is located on approximately 128.4 acres in eastern Marshfield, Massachusetts (see Figure 1 in Appendix A) approximately two miles east of the central business district. The Airport mainly serves corporate, business and recreational flyers and is fully outfitted to provide aircraft charter, flight instruction, aircraft rental and sales, aircraft repair and maintenance and aviation fueling services.

The Airport has one paved runway, Runway 6/24 which is 3,900-feet long and 100-feet wide with a full-length parallel taxiway and stem taxiways. The runway has a single wheel capacity of 12,500 lbs. The runway is equipped with Medium Intensity Runway Lighting (MIRLS), a Precision Approach Path Indicator (PAPI) at Runway 24, Runway End Identifier Lights (REILS) systems and non-precision instrument approach markings. Airside facilities consist of a complete taxiway system, general aviation aprons, T-hangars and associated aviation support services.

Based on the FAA 5010-1 Airport Master Record form (accessed 1/16/2020) GHG has 24 single-engine aircraft, two (2) multi-engine, and four (4) jet aircraft, and two (2) ultralights based at the Airport. The Airport handles approximately 23,600 annual aircraft operations from both based and itinerant aircraft. Aircraft operations include air taxi, both local and itinerant general aviation aircraft and military aircraft operations. For design purposes (per FAA AC 150/5300-13A), GHG has an Airport Reference Code (ARC) of B-II and a design aircraft of a Cessna Citation II. The Airport has no air traffic control tower; pilots operate at the field by observation and communication with other planes on a common radio frequency.

The airport was built in 1949 when Joseph Ford, a Navy pilot in World War II, decided he wanted to build an airport near to his home in Marshfield. The town purchased the airport in 1965. In 1969 the airfield was finally paved. Over the years, the airport has undergone significant improvements, including renovation of the administration building. Most recently, the airport received federal funding from the Federal Aviation Administration (FAA) to complete extensive safety improvements resulting in a 3900 x 100' runway that includes 300' safety runway safety areas on each end, increased separation between the runway and taxiways, a 300' extension, widening the runway to 100', new lighting systems including a Precision Approach Path Indicator Light System (PAPI) on the Runway 24 Approach end; clearance of obstacles (trees) in approach zones, new Instrument Approaches, including Localizer Performance with Vertical Guidance (LPV). These improvements helped bring the airport into compliance with current FAA safety and design standards, making the airport safer for the flying public and the entire community.

This project began work in fall 2013 and was completed by early 2014. During this period the airport installed new fencing near the main terminal building and parallel to the runway on the northern side and another portion southeast of the runway. That project did not install fencing around the entirety of the airport and therefore left gaps open where wildlife have continued to enter the airfield and pose significant threat to aircraft during taxiing, take off and landings.

Under FAA Order 5050.4B Section 209 and 14 CFR Part 139, airports seeking operating certification are required to implement a Wildlife Hazard Mitigation Plan for safety purposes. The Airport is not seeking an operating certification; although intends in the Proposed Action to address wildlife hazards for the safety of airplane operators and passengers.

A Wildlife Hazard Assessment (WHA) was therefore completed in March 2020 to address these safety concerns. The WHA detailed the types of animals observed on the airport. A short list of the most dangerous species with relative hazard



scores (FAA Relative Hazard ranking of Hazardous Species) noted that five (5) of the top ten (10) species were present at the airport, white-tailed deer, Canada goose, other ducks, wild turkey, and bald eagle, see Table 1 below.

Table 3. FAA Relative Hazard Ranking of Hazardous Species⁴

Species Group	Composite Ranking	Relative Hazard Score	Observed during Assessment
Mule deer	1	100	No
White-tailed deer	2	88	Yes – on Airport
Domestic dog	3	71	No
Other geese	4	61	No
Canada goose	5	46	Yes – on Airport
Turkey vulture	5	44	Yes
Other ducks	7	48	Yes – on Airport
Great horned owl	8	44	No
Double-crested cormorant	9	43	Yes
Brown pelican	10	40	No
Wild turkey	11	40	Yes – on Airport
Sandhill crane	11	37	No
Glaucous-winged gull	13	39	No
Bald eagle	14	36	Yes – on Airport
Great black-backed gull	14	32	Yes – on Airport
Osprey	16	32	Yes – on Airport
Great blue heron	17	31	Yes – on Airport
Ring-necked pheasant	18	29	No
Herring gull	18	29	Yes – on Airport
Snowy owl	20	28	Yes – on Airport
Mallard	21	29	Yes – on Airport
Great Egret	22	28	Yes – on Airport
Red-tailed hawk	23	25	Yes – on Airport
Ring-billed gull	26	23	Yes
Raccoon	28	20	Yes – on Airport
Coyote	29	22	Yes – on Airport
Rock dove	30	20	Yes – on Airport
Rabbits	37	13	Yes – on Airport
Red fox	41	14	Yes – on Airport
American crow	41	12	Yes – on Airport
Mourning dove*	45	10	Yes – on Airport
Blackbirds	46	9	Yes – on Airport
* This species was involved in at least one strike at GHG.			

Current wildlife management at the airport includes turf management, habitat modification, vehicular harassment, pyrotechnics, and depredation. Wildlife control is conducted by personnel during airfield checks and normal operations, pilot observations are also noted. Runway sweep occur prior to the day's first take-off and as necessary throughout the day. The airport holds current State and Federal depredation permits for migratory birds and mammals. This allows the

⁴ Data taken from the Federal Aviation Administration National Wildlife Strike Database for strikes that occurred in the United States from 1990 to 2009.



culling of certain preapproved species outside of the normal hunting seasons. The airport also allows volunteers to take white-tailed deer during the hunting season as well.

The Airport has a partial perimeter fence to protect the Airport Operations Area (AOA) from wildlife and for other security purposes. The fences run generally northeast to southwest, parallel to the runway and outside the runway safety area. The fences were extended and realigned to meet FAA recommendations during the most recent runway reconstruction project in 2013-2014; however, the runway ends were not completely fenced due to the presence of Bass Creek and Green Harbor Rivers and related environmental permitting challenges. Most of the fence is eight-feet tall with standard galvanized steel pipe frames and either black vinyl coated (9-gauge core) or galvanized steel fence fabric and three-strand, barbed-wire tops. Portions of the newer fences are wrapped with acoustical fencing and have “turtle gates” at specific intervals.

Older sections of fence located near the administration building and western T-hangars have 6-foot standard galvanized steel fence with three-strands of barbed wire. Swing gates or powered slide gates with keycard access are generally 12-feet wide and provide access to the Airport at specific locations. The perimeter fence generally serves as a security fence and wildlife exclusion fencing. Along each of the end posts, there are well-worn wildlife trails providing access from the adjacent area to the airport. Additionally, trail cameras and personnel anecdotes have confirmed that white-tailed deer, eastern coyote and other mammals access via these trails. Deer were occasionally observed along the northern and southern edges of the AOA, they can readily cross streams and forage and bed along brush habitat near the runway.

Vegetation management occurred in 2013 during the construction of the new runway. Heavy logging equipment was required as the forests to the south and west of the runway were fully mature stands comprised primarily of red maple (*Acer rubrum*). Feller bunchers were used to cut and lay down the trees and forwarders would load them and haul them to stockpile areas. In order to get to the west of Green Harbor River a temporary bridge was built across the river using steel i-beams. These were laid down from one bank of the river to the other and bog mats were laid on top to serve as decking so the equipment could cross the river. A heavy crane was trucked in for the purpose of laying the I-beams. This was a temporary bridge and it was removed at project end. A temporary access road was required through the wetland near the Runway 6 end.

7.0 PROPOSED ACTION

7.1 PROPOSED ACTION

The Proposed Action is also presented as Alternative III in the Alternatives Section below.

In accordance with the recommendations of the WHA the Airport proposes to:

- Completely enclose the airfield with a wildlife fence; and,
- Acquire easement on roughly 2.235 acres of property from Massachusetts Audubon to secure to install the wildlife fence.

Due to FAA setback requirements for the Runway Safety Areas (RSA) and Runway Object Free Areas (ROFA) the airport fence must offset from the edge of the runway requiring the acquisition of the easement on Massachusetts Audubon property which already has an aviation easement for vegetation management associated with the Airport.



7.2 FENCE DESIGN

The Proposed Action consists of fencing that would have an effective height varying from 6-feet tall to 8-feet tall depending upon location and localized conditions, with an additional three strands of out-facing barbed wire along the top in all locations.

Vegetation can undermine the effectiveness of the barrier by either creating a bridge over the barbed wires for both people and animals or growing through the fence. In order to avoid such circumstances, the fence would be constructed with access directly to the fence from within the airport; the airport maintains mown lawn right up to the fence where not in mucky wetland areas.

This Proposed Action involves the installation of a total of 1,070 linear feet (LF) of exclusionary fencing in the area of RW 6 and 2,250 LF of fencing in the area of RW 24, and additional 2,190 LF of fence replacement along the north side of the airport, totaling 5,510 LF.

The existing fence has been evaluated for effectiveness such as height, vegetation buffer, barbed wire, openings, and gaps in the barrier. Sections that do not meet National Part 139 CertAlert No. 16-03 will be replaced with the new heights and barbed wire. This is the case primarily from where the fence runs perpendicular to Airport Rd to the north of the T-hangers extending southeast and east to where the existing fence terminates encompassing a total of 2,190 LF.

New fencing within rare and endangered species habitat, will include “turtle gates.” These gates are small rectangular permanent openings small enough for the largest Eastern Box Turtle (*Terrapene carolina carolina*) to pass through but prohibitive to larger species including white-tailed deer and coyotes. Such turtle gates were incorporated in the existing fence which was installed in 2013 and have proven to be effective in allowed entry and egress of the turtles since that time. There are 37 proposed turtle gate openings on the 6-End each a total impact of 74 SF.

Alternatives

7.3 ALTERNATIVES

- Off-Airport Property Rights
 - No Purchase
 - Purchase, Easement (Preferred) or Memorandum of Understanding (Preferred)
- Alternatives for Fence Location Selection
 - Alternative I – No-Build
 - Alternative II – Partial Fence
 - Alternative III – Full Fence (Preferred)

7.3.1 FAA RULES FOR PROPERTY ACQUISITION OR LONG-TERM LEASING

7.3.2 PROPERTY ACQUISITION

FAA Order 5050.4B Section 204 addresses Land Acquisition and for Long-term leases. Since the Airport receives Airport Improvement Program (AIP), FAA must ensure that Order 5050.4B procedures are followed. Section 204a. states:

General. Airport sponsors may have the authority to buy or condemn land bordering their existing airports or to build a new airport at a new location without prior FAA approval. Title 40 CFR 1506.1(a) and (b) note that, until a Federal



agency issues its Record of Decision, neither the agency or the applicant, respectively, may take action concerning any proposal that would have adverse environmental impact or limit the choice of reasonable alternatives.

The Airport considers this rule when analyzing alternatives below.

7.3.3 NO PURCHASE

The no purchase option would prevent the installation of wildlife fencing segments at each end of the Airport, this would leave gaps in the fencing. This option would prevent Alternative III and Alternative IV from being implemented.

The segments without fencing would then expose the rest of the Airport to unimpeded wildlife passage and therefore not reduce the possibility large mammal/aircraft collision and would not satisfy the purpose and need. Section 204 would not need to be addressed if no land was purchased or leased.

7.3.3.1 PURCHASE, EASEMENT OR MEMORANDUM OF UNDERSTANDING

The acquisition or legal agreement for access to the parcels for the installation of the proposed wildlife fence would provide the Airport the ability to install the proposed fencing as described below.

The acquisition or legal agreement (through an Easement or Memorandum of Understanding) for access to the Town of Marshfield and Massachusetts Audubon parcels for the installation of the proposed wildlife fence would serve the purpose and need of the Proposed Action to ensure that the entirety of the Airport was totally encircled by exclusionary wildlife fencing and reduce the possibility of large mammal/aircraft collision. Section 204 would need to be addressed if no land was purchased or leased, a Record of Decision would be required to address this alternative.

7.3.4 ALTERNATIVES FOR FENCE LOCATION SELECTION

The Purpose and Need section of this EA details why the proposed wildlife fence is necessary for the prevention of large mammal/aircraft collision.

The existing conditions do not deter wildlife such as deer and other animals from entering the airfield because the existing fence does not completely surround the airport. The airport has the appropriate permits from MassDEP to hire personnel to cull such animals, but this is only during certain hours of the day and is only effective if the personnel locate and target the wildlife and are generally available to do this. These efforts have failed to eliminate the presence of white-tailed deer and eastern coyote, the two main threats.

Since 2013, much of the land clearing of obstructions (trees) has changed the approach and transitional surfaces into shrub/scrub areas where white-tailed deer and coyote preferably forage and bed. Within the existing fenced areas, most of the ground cover is grassed which is highly attractive to white-tailed deer in particular; currently, they easily walk around the existing fence to access these areas.

7.3.4.1 ALTERNATIVE I – NO-BUILD

No action would result in the sustained possibility of large mammal/aircraft collision of white-tailed deer and eastern coyote. Collisions cause property damage primarily to the aircraft but can also lead to pilot/passenger injury or death. Although this alternative does not impact the surrounding environment, the potential for property damage and hazard to life caused by another deer or other wildlife strike has an indeterminate cost and loss associated with it. There would be no environmental impacts from this alternative.



ALTERNATIVE II – PARTIAL FENCE

This alternative involves the installation of only portions of the wildlife /perimeter fence on either end of the runway. This would not fulfill the goal of completely encircling the airport with exclusionary fencing and would not prevent any access by wildlife or persons. This alternative will not prevent wildlife or persons from entering the airport

Alternative III – Full Fence (Preferred Alternative)

This alternative involves the installation of wildlife /perimeter fence on both ends of the runway and replacement of a portion of the fence on the northern end of the Airport. This would fulfill the goal of completely encircling the airport with exclusionary fencing and would work to prevent access by wildlife or persons.

7.4 ALTERNATIVES MATRIX

The previous alternatives were analyzed and compared to define the issues and provide a clear basis for the most reasonable choice amongst the options. Table 4 outlines the alternatives and the associated impacts.



Table 4. Alternatives Matrix

Alternative	Description	Impacts	Preliminary Wildlife Impacts
Easement (Option Presumed in Alternative II and III)	Purchase or Secure an Easement to Allow Work to Occur	Depends on Alternative Selected	Depends on Alternative Selected
Alternative I – No Build	No Bridge, No Fence, and no Purchase/Easement	None	Wildlife Would Continue to Access the Airport, Potential for Large Mammal/Aircraft Collision
Alternative II – Partial Fence	Partial Installation of Wildlife Fence	<p>RW 6-End Only: 1,069 LF from Fence Fabric, 6 SF from Fence Posts, and 74 SF from 37 Foot Turtle Gates</p> <p>or</p> <p>RW-24 End Only: 2,253 LF from Fence Fabric, and 12 SF from Fence Posts</p> <p>or</p> <p>Northern Fence Replacement Only: 943 LF from Fence Fabric and 6 Sf from Fence Posts</p>	Serves to Partially Exclude Wildlife from Entering Airport
Alternative III – Full Fence	Fully Enclosed Fence	<p>5,510 LF 6-End, 24-End, Northern Fence Replacement</p> <p>also</p> <p>37 Foot Turtle Gates (2SF/Gate = 74 SF)</p> <p>also</p> <p>431 Posts (0.05 SF/Post = 21.55 SF)</p>	Serves to Excludes Wildlife from Entering Airport



8.0 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES AND MITIGATION

8.1 INTRODUCTION

There are 14 environmental impact categories identified by FAA Order 1050.1F. Per direction provided in FAA Guidance Memo #2, 2011, it is the intent of this document to provide detailed discussion or analysis of only those environmental resources the Proposed Action and its reasonable alternatives that may affect. The amount of information on a potentially affected resource is based on the extent of the expected impact and is commensurate with the magnitude of impact to that resource.

For the following potential impact categories, analysis is not required because either the resource is not present within the project boundary or the No Action, Proposed Action, and reasonable alternatives would not be affected.

The No Action, Proposed Action and reasonable alternatives would not affect:

- Air Quality
- Climate
- Farmlands
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Land Use
- Natural Resources and Energy Supply
- Noise and Noise-Compatible Land Use
- Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks
- Visual Effects

The Proposed Project has the potential to impact the following environmental categories and these are addressed in more detail in the sections below:

- Biological Resources
- Coastal Zone Management
- Floodplains
- Historic and Archaeological and 4(f) Protected Land
- Water Quality
- Wetlands and Surface Water
- Farmlands

8.2 BIOLOGICAL RESOURCES

8.2.1 AFFECTED ENVIRONMENT

Biotic (living) resources refer to the various types of flora (plant life) and fauna (animal life) in a particular area. The term also refers to vegetative communities, both upland and wetland, that support the flora and fauna associated with a given area, including state-listed endangered/threatened or species of special concern. A U.S. Fish & Wildlife Service – Information for Planning and consultation (IPaC) submittal for the Site indicated that there are no known Federally-listed endangered or threatened species present at the Airport (Appendix E).



Upland Vegetation

Upland vegetative communities within and near the Airport primarily consist of maintained grounds and limited areas of upland forest and scrub-shrub communities. The maintained grounds occupy areas adjacent to the airport runway, taxiways, support structures, asphalt roads, and neighboring residential lots. In the northern portion of the Airport property, the maintained grounds transition to limited area occupied by an upland/wetland scrub-shrub community followed by an upland forest. Most of the developed lands surrounding the Airport are vegetated with lawns and landscaped with trees and shrubs. The maintained grounds are dominated by herbaceous vegetation that is cut on a regular basis. The remaining areas to the east, west and south of the Airport are occupied by two watercourses and various wetland communities.

Aquatic and Wetlands Vegetation

Freshwater wetlands on and adjacent to the Airport which provide wildlife habitat are shown on the Plans in Appendix B. Briefly, large contiguous freshwater wetland systems border the Airport to the northeast, east, west and south and drain into the Green Harbor River to the west and Bass Creek to the east. Both rivers are low gradient with slow meandering flows. Bass Creek converges with the Green Harbor River approximately 1,800 feet to the south of the Airport. The Green Harbor River flows south to a tide gate and eventually to the Green Harbor and Massachusetts Bay.

Freshwater wetland habitats present include forested wetland, wet meadow, emergent marsh, and wetland shrub-scrub communities. Areas to the east and north of the Airport are occupied primarily by an emergent marsh followed by forested wetland. Areas to the west and south of the airport are occupied by a relatively narrow area of wet meadow followed by scrub-shrub and forested wetland communities.

Wildlife Habitat

Terrestrial, aquatic and wetland plant communities within the project study area provide a range of importance to wildlife species which utilize the area, as detailed in the WHA included as Appendix D.

The Airport property consists of approximately 230 acres of land, of which approximately 170 acres is undeveloped vegetated wetland. The undeveloped and vegetated areas of the Airport provide resources for numerous wildlife species. The Daniel Webster Wildlife Sanctuary operated by Mass Audubon borders the Airport to the south and provides approximately 530 contiguous acres of undeveloped land available to wildlife species.

Plant communities in and around the Airport provide habitat for a relatively diverse assemblage of wildlife species, based on the expanse of undeveloped land and variety of habitats. According to the WHA, approximately ninety-one (91) species of birds, fifteen (15) species of mammals and two (2) reptile species were observed on or within 10,000 feet of the Airport.

Collectively, the relatively diverse vegetative resources provide some or all of the life-sustaining requirements for numerous wildlife species, particularly since many of these species utilize multiple habitats during their life cycles. Species for which suitable habitat is available on and proximate to the Airport include a wide range of large and small mammals, birds of prey, wading birds, songbirds (resident and migratory), reptiles associated with upland and freshwater wetland habitats, and various finfish.

Based on previous work completed at the Airport, the Airport and surrounding forested and scrub-shrub communities, primarily to the south of the airfield, offer excellent habitat for the Eastern Box Turtle. Such habitat types include:



Forested Wetland (FW): The majority of the natural, undisturbed area within the Vegetation Management Areas (VMA) is composed of a large block of forested red maple swamp, interspersed with smaller areas of deciduous forested uplands. These forested wetland areas are present primarily to the south and west of the runway and are bordered by the Green Harbor River and Bass Creek to the south, east and west. It appears that this forested wetland was at one time a tidal marsh, as the river system was tidally influenced prior to the construction of tide gates during the Industrial Revolution. This area has numerous parallel ditches excavated through the swamp that drains south to the Green Harbor River.

Smaller areas of this community are present along the north side of the runway and taxiways, between the runway and the residential areas to its north. This community occupies approximately 50 percent of the Airport property, and a major portion of the off-Airport VMA's. This community is likely to have the largest area of impacts under the VMP.

Despite its former tidal character, this community can now be classified as a Red Maple Swamp with the dominant canopy tree being mature to semi-mature Red Maple (*Acer rubrum*) with sporadic inclusions of Grey Birch (*Betula populifolia*), American Elm (*Ulmus americana*), Green Ash (*Fraxinus pennsylvanica*), Hemlock (*Tsuga canadensis*) and White Pine (*Pinus strobus*). The canopy offers 75-90% percent shading to the groundcover below. The canopy is approximately 70 feet tall, on average, with a fairly dense understory composed of canopy tree regeneration, High Bush Blueberry, Spicebush, Winterberry, Greenbrier, Glossy Buckthorn, Poison Ivy, Riverbank Grape and Sweet Pepperbush. The groundcover is moderately dense with common species such as Cinnamon Fern, Sensitive Fern, Lady Fern, False Hellebore, Skunk Cabbage, Woodfern and Dewberry present throughout. Common invasive species present in this community include Glossy Buckthorn and Oriental Bittersweet with lower densities of Honeysuckle spp., Japanese Barberry and Multiflora Rose.

Forested Upland (FU): The forested upland community can be classified as a mixed deciduous/coniferous forest containing principally Red Maple, White Pine with inclusions of Sugar Maple, Red Oak, White Oak, Grey Birch, Black Cherry, Red Cedar, Quaking Aspen and Big-toothed Aspen. These areas are mature to semi-mature with canopy height ranging from 70 to 80 feet. The understory is moderately dense consisting of species similar to those in the forested wetland areas with additional upland shrub inclusions. Common under and ground story species within this community include: Northern Arrowwood, Highbush Blueberry, Early Lowbush Blueberry, Late Lowbush Blueberry, Greenbrier, Partridge Berry, Canada Mayflower and Wintergreen. Common invasive plant species in this natural community include Honeysuckle spp., Oriental Bittersweet, and Multiflora Rose. Japanese Barberry and Common Buckthorn are also found in low densities throughout this community type.

Forested upland areas are relatively limited around the runway and are mostly relegated to the extreme northern edge of the Airport property, between the runway and the adjacent residential development. Some areas of forested upland are also located in and around the extensive forested wetland system to the south of the runway, and for the most part are smaller inclusions within the larger wetland complex. Portions of this community will also require cutting under this VMP.

Scrub Shrub Areas (SSU/SSW): Scrub-shrub areas are relatively limited on the Airport and are generally located at the transition between the upland fields and the forested areas. These areas are maintained through the removal of trees, and primarily consist of a mixture of tree saplings and shrub species found in the forested areas, with a greater variety of herbaceous plants. The scrub-shrub areas within VMAs consist of both upland and wetland shrub areas. Because of the shift of the protected surfaces, some of these areas may require management, and some will require continued long-term maintenance.

Wet Meadow (WM): Located on the perimeter of the runway and taxiways and near the rivers are areas maintained as wet meadow communities. These areas are generally located within the Part 77 and TERPS surfaces of the Airport, thereby



requiring continuous management to prevent regeneration of tall trees and shrub species. Management typically comes in the form of periodic mowing, with frequency increasing closest to the runway/taxiway system. Taller areas of this community have some limited shrub development, with less than 20% of the community composed of shrubs. The vast majority of this plant community consists of forbs and sedges. Common species within this community include Goldenrods, Broadleaf Cattail, Greenbrier, Raspberry, Soft rush, Grey Birch, Northern Arrowwood, Poison Ivy and Reed Canary Grass (an invasive species).

Emergent Marsh (EM)/ Open Water (OW): Several emergent marshes are located on the periphery of the runway, and are transitional areas between the wet meadow/forested wetlands and the open water of the two rivers that drain southward from the northeast and southwest ends of the runway. The most extensive marsh areas are located northeast of the runway and border Bass Creek. These emergent areas vary in depth and are typically shallower nearest to the runway transitioning to open water associated with the riverine system. The deeper emergent marshes generally include dense stands of Cattail, which are present along the edges of Bass Creek, and within the wet meadow areas along the Green Harbor River. Shallow emergent marsh areas on the Airport are limited to one large area that is present along the northeastern portion of the runway area, wrapping around the southeast portion of the Runway 24 end and continuing partly along the north side of the runway. This area is vegetated by dense stands of Tussock Sedges with some Rushes, Sphagnum Moss and short shrubs of Blueberry, Winterberry and Dogwood also present. This system has shallow (6-18") standing water for the majority of the growing season, becoming partly seasonally saturated during the driest conditions. Given the limited height of vegetation within these emergent water areas, these communities will likely only require occasional long-term maintenance.

Open water areas have limited vegetation and include both the Green Harbor River, and Bass Creek, as well as several constructed drainage ditches located throughout the forested wetland areas, a small farm pond located on the Woodbine Farm property, and a ponded area located to the south of the Woodbine Farm property. The water limits any tall vegetation and for the most part, open water areas do not require much maintenance under the VMP.

Cultural Grasslands (UM): The community proximal to the runway is either developed or actively maintained to varying degrees. In general, closer to the runway, the vegetation is managed more actively and frequently. The Part 77, Primary Surface around and between the runway and taxiways is composed of grasses and forbs that are mown once per month, on average, during the growing season. These plants are short cropped and consist of typical lawn species such as common upland grasses, Plantain, Dandelion, Clover, Lichen, Haircap Moss, Sorrel, and Hawkweeds. The frequent mowing effectively excludes trees and shrubs from the area.

Disturbed Areas: Several areas of high disturbance including the active runway, taxiways and aprons, associated infrastructure and adjacent residential areas are located within the VMAs. With the exception of the mown Primary Surface, the majority of the developed portion of the Airport is paved or otherwise consists of other impervious surfaces (buildings, hangars, etc.). No maintenance of these areas is required under the VMP. There are also several medium density residential areas northwest of the runway. These areas have landscaped yards with occasional shade trees present. Depending on the height of the trees, some areas may require easements and removal of individual trees.

8.2.2 CONSEQUENCES AND MITIGATION

Vegetation / Wetlands



Installation of the fence would create minor impacts to upland and wetland vegetation. The action alternatives would affect these resources. Vegetation would be cleared 15 feet on both sides of the fence alignment corridor and permanently maintained either by using small equipment or hand clearing to keep the fence visible and reduce maintenance.

In wetland areas, minimal impacts would occur from vegetation removal and fence. In wetland areas, low bearing pressure (tracked) equipment used to access the fence alignment. Poles would be pile-driven as depicted in the photo provided using a Marsh Master. All vegetation would be cut flush to the ground. Long-term vegetation management would occur along the fence corridor and would be conducted in a similar manner as initial removal using the least impacting methods.

Mitigation

In order for any fence alignment to be installed, maintained and remain visible, vegetation would need to be removed, managed and controlled. No mitigation is proposed as the clearing has been previously approved under the Vegetation Management Plan.

Wildlife / Biota

Installation of a fence would minimally impact wildlife. The subject areas of existing habitat would be removed for future use to individual medium- to large-sized mammals. However, impacts to these individuals would not significantly affect the overall population in this region, as the fencing will only exclude them from developed areas of the Airport. The exception is to the Eastern Box Turtle, where turtle gates would be installed in the fence at intervals to allow passage.

Mitigation

The proposed actions would result in a modification to the nesting habitat available to the EBT, an Amended Conservation Management Permit (Appendix G) has been filed with the Massachusetts Natural Heritage and Endangered Species Program and is pending approval.

The current Massachusetts National Heritage & Endangered Species Program (MA NHESP) Priority Habitat mapping depicts that portions of the proposed work areas are within mapped rare species habitat (Appendix A, Figure 4). The Airport and surrounding forested and scrub-shrub communities, primarily to the south and west of the runway (RW 6 end), offer excellent habitat for the Eastern Box Turtle. The mosaic of forested wetland and upland to the south and west of the runway provide ample forage, overwintering, breeding and aestivation sites for a substantial population of this species.

The Proposed Action proposed minor tree clearing. In total 4,000 SF (0.09 ac) of trees will be removed, approximately an area 200 feet x 20 feet. This represents a loss of overwintering habitat which will be converted to scrub-shrub forage/breeding habitat. In order to mitigate for impacts to the turtles, the proposed tree removal work will be completed by October 15 or will occur the following spring. All on-site activity will be supervised by a MA NHESP approved turtle biologist. The proposed fence will have turtle gates of a similar configuration as the ones installed under the CMP and at the same interval in this area. GZA will also provide turtle training to the contractors on site prior to the start of work.

Detailed discussion of existing wildlife habitat and usage by wildlife is presented in the WHA prepared for the Airport. Based on the information presented in the WHA, activity patterns and population dynamics of small-sized mammals, as well as reptiles, amphibians and fish populations, are not likely to be disrupted by the proposed action due to the relatively small home ranges characteristic of these species.



The Airport currently occupies approximately 230 acres. With the exception of small-sized mammals noted above that are small enough to enter the site via gates and/or other similar structures, the installation of the proposed fencing would effectively preclude access by medium- to large-sized species to approximately 60 acres of developed land consisting of maintained grounds, runway, taxiways and support buildings. The remaining 170 acres of land presently serving as wildlife habitat, would remain as available habitat (outside the fence) to medium- to large-sized species following fence installation. As a result of the proposed action, there will be an overall reduction of approximately 26% of available developed habitat to medium- to large-sized species.

Although the existing wildlife populations would be confined to a smaller landscape, the remaining undeveloped lands surrounded the Airport would remain untouched and provide contiguous habitat to existing wildlife populations. These habitats would continue to sustain the similar number of individuals and carrying capacity that currently utilizing the area.

8.3 COASTAL ZONE MANAGEMENT

8.3.1 AFFECTED ENVIRONMENT

Federal Activities involving or affecting coastal resources are governed by the Coastal Barriers Resources Act (CBRA), the Coastal Zone Management Act (CZMA), and Executive Order 13089, Coral Reef Protection Act (CRPA). The Airport and its surrounding lands are not Coastal Barriers nor do they contain coral reefs, therefore the CBRA and EO 13089 do not apply.

The Airport and surrounding lands are within the Coastal Zone of the Commonwealth. Coastal Zone Management consistency review is required for projects that: 1) are in, or can reasonably be expected to, affect the resources or land or water uses of the coastal zone; and, 2) require a federal license or permit, are federally funded or are a direct activity of a federal agency.

Bass Creek and Green Harbor River and their associated wetlands in the project area are freshwater wetlands immediately upstream of coastal resources along the shoreline, namely Green Harbor. The tidal influence to these resources is limited due to the presence of tide gates at Route 139. Before the presence of the tide gates and other downstream constrictions the area surrounding the Airport likely contained estuarine resources with higher salinity and salt marsh plants such as *Spartina spp.*. As a result of the current downstream alterations (tide gates), the wetlands associated with Green Harbor River and Bass Creek near the Airport are freshwater systems. According to the CZMA, freshwater wetlands in the proximity of coastal resources (estuaries, salt marsh, etc.) are considered coastal resources.

8.3.2 CONSEQUENCES AND MITIGATION

Installation of a fence would minimally impact coastal resources. Minimal and temporary impacts are anticipated to the freshwater wetland systems considered to be coastal resources at the Airport. The action alternatives would not affect these resources. Consultation with the Office of Coastal Zone Management (CZM) has been initiated and is included in Appendix C.

Mitigation

Anticipated impacts to coastal resources are expected to be minimal and temporary. Therefore, no mitigation is anticipated for the proposed action. However, if during consultation with CZM indicates that mitigation will be necessary, alternatives will be made in the design analysis to avoid and minimize impacts to these resources to the greatest extent practicable.



8.4 FLOODPLAINS

8.4.1 AFFECTED ENVIRONMENT

The Airport is located adjacent to the Green Harbor River and Bass Creek in an area which has been designated by the Federal Emergency Management Agency (FEMA) as Zone AE, with a base flood elevation of 9 feet North American Vertical Datum of 1988 (NAVD88) (see Figure 3 in Appendix A). With a few immaterial exceptions, the entirety of the Airport property is located within a Special Flood Hazard Area. These flood hazard areas are subject to inundation by the 1% annual chance (100-year) flood. The floodplain designation as Zone AE indicates a flood insurance rate zone with base flood elevations determined in the Flood Insurance Study by detailed methods of analysis. The Flood Insurance Rate Map (FIRM) for the area was updated recently, and adopted by FEMA, November 4, 2016.

8.4.2 CONSEQUENCES AND MITIGATION

Impacts to the 100-year floodplain from implementation of the Proposed Action are expected to be minimal and incalculable because there will be no change to the existing ground elevation. The proposed improvements will be too small in scale to have an effect on the 100-year flood plain. Therefore, no mitigation is anticipated for the proposed action.

8.5 HISTORIC AND ARCHEOLOGICAL AND 4(H) PROTECTED LAND

8.5.1 AFFECTED ENVIRONMENT

Procedures in Section 106 of the National Historic Preservation Act of 1966 and the Archaeological and Historic Preservation Act of 1974 are used to evaluate impacts to Archaeological, Architectural, and Cultural resources.

8.5.2 ARCHEOLOGICAL

An archaeological survey was performed prior to the Runway Extension and Realignment Project in 2013-2014. The review indicated that further onsite investigations were warranted. This survey resulted in the discovery of numerous artifacts, stemming from up to 10,000 years ago to the colonial period. Artifacts were cataloged for the periods including for pre-contact native American cultures such as the PaleoIndian Period, Early Archaic Period, Middle Archaic Period, late Archaic Period, Transitional Archaic Period, Early Woodland Period, Middle Woodland Period, and the Late Woodland Period. Excavations took place at that time and thousands of artifacts were recovered and cataloged.

As a result of these discoveries, it was deemed prudent to perform a survey for the Proposed Action. A Public Archeology Laboratory, Inc (PAL) archeologist performed such a survey and prepared a Technical Report in January 2020 entitled Intensive Archaeological Survey and Supplemental Site Examination Marshfield Municipal Airport-George Harlow Field Right-of-Way Easement Acquisition and Perimeter Fence Project (see Appendix F). This report details the history of the Site, the most recent on-site survey, and conclusionary statements concerning the Proposed Action.

8.5.3 SECTION 4(F)

According to U.S. DOT's guidance Section 4(f) properties are those which are protected from development and are left as conservation land, "Section 4(f) protects the following basic types of properties: publicly owned park and recreation areas that are open to the general public, publicly owned wildlife and waterfowl refuges, and public or privately owned historic sites." (FAA Section 4(f) Tutorial).



Mass Audubon, a land conservation organization, owns parcels in the vicinity of the Airport. Some of these parcels are located south of the Airport and are used for recreational purpose and for wildlife refuge. Those in the vicinity of the Airport are not accessed by the general public and are therefore not used in such a manner. The Airport is seeking an easement for the fence on a portion of Audubon property that is currently under an aviation easement (for Airport vegetation management purposes). There will be no impacts to passive recreation because this is a remote location and small portion of the overall Mass Audubon property.

8.5.4 CONSEQUENCES AND MITIGATION

The FAA is responsible for determining if the proposed project would affect any historic properties or areas of archaeological sensitivity. There are areas of archaeological sensitivity within the project area. Although significant archeological artifacts have been previously collected at the Airport in the vicinity of the proposed work, no new impacts are expected.

The PAL Technical Report concluded that (see Chapter 5 of PAL's technical report in Appendix F, pages 57-58):

"No pre-contact or post-contact sites or other cultural resources were found during subsurface testing of the proposed perimeter fence lines in the northeastern to northwestern and southeastern sections of the Marshfield Municipal Airport-George Harlow Field Airport ROW Easement Acquisition and Perimeter Fence Project area. Small amounts of pre-contact and post-contact cultural material were found in sections of Loci 1 and 9 of the Marshfield Airport Site (19-PL-426) within the APE for the southwestern section of the proposed perimeter fence and Woodbine Road cul-de-sac reconstruction area. With the exception of a Late Archaic projectile point found on the surface in a previously disturbed area, the pre-contact material found in Loci 1 and 9 consists of low-density deposits of non-diagnostic chipping debris. These findings are similar to those of previous archaeological investigations at Locus 1 and for installation of perimeter/sound barrier fencing across Locus 9 adjacent to the Woodbine Road cul-de-sac (Binzen 2009; UMAS 2018).

The few sherds of ceramic types (redware and North Devon gravel-tempered ware) found at Locus 9 within the APE for the Woodbine Road cul-de-sac reconstruction area likely represent a low-density scatter of domestic refuse associated with the seventeenth- to eighteenth-century Waterman House Site (MRS.HA.11) or the Plantation/Colonial Period (1620–1675) occupation (MARS.HA.12) of Locus 9. However, the sherds were not recovered from intact, original depositional contexts and do not represent potentially significant post-contact cultural material. The more recent fragments of bottle glass and ceramic sherds found in the cul-de-sac reconstruction area are associated with modern residential development in two lots on Woodbine Road and are not potentially significant.

The Marshfield Airport and Waterman sites have been determined eligible for listing in the National Register of Historic Places (National Register) by the FAA during previous consultations. However, the portions of Loci 1 and 9 within the APE for the current Project have low information content and do not retain enough integrity to be considered potentially significant archaeological resources.

Further study of Loci 1 and 9 of the Marshfield Airport Site and of the Waterman House Site for the Marshfield Municipal Airport-George Harlow Field ROW Easement Acquisition and Perimeter Fence Project, as currently planned, is unlikely to yield new information, and no additional archaeological investigation is recommended."

The Airport and the FAA therefore expect that the Project would have no effect on historic, architectural or archaeological resources listed on or eligible for the National Register of Historic Places (Appendix F).



8.6 WATER QUALITY

8.6.1 AFFECTED ENVIRONMENT

As previously discussed, the airfield is bounded on its northeast and southwest ends by two watercourses, Bass Creek and Green Harbor River, respectively. Bass Creek converges with the Green Harbor River approximately 1,800 feet to the south of the Airport. The Green Harbor River flows south to a tide gate and eventually to the Green Harbor and Massachusetts Bay. Green Harbor has a surface watershed area of approximately 7.7 square miles.

The Massachusetts Surface Water Quality Standards (SWQS) designate the most sensitive uses for which the surface waters of the Commonwealth shall be enhanced, maintained and protected; prescribe minimum water quality criteria required to sustain the designated uses; and include provisions for the prohibition of discharges. The surface waters are segmented and each segment is assigned to one of five classes (A, SA, B, SB, and C). Each class is identified by the most sensitive and therefore, governing, water uses to be achieved and protected. Surface waters may be suitable for other beneficial uses, but shall be regulated by the MADEP to protect and enhance the designated uses.

Of the five classes of water quality, Classes A and SA have the highest water quality standards to protect the highest uses of human consumption and excellent habitat quality.

Another form of water quality classification is the EPA system that has been designed in accordance with the requirements of Section 305(b) and 303(d) of the Clean Water Act (CWA). This listing is commonly referred to as the "303(d) list of impaired waters". The classification system is as follows:

- Category 1 - Unimpaired and not threatened for all designated uses;
- Category 2 - Unimpaired for some uses and not assessed for others;
- Category 3 - Insufficient information to make assessments for any uses;
- Category 4 - Impaired or threatened for one or more uses but not requiring the calculation of a Total Maximum Daily Load (TMDL); or
- Category 5 - Impaired or threatened for one or more uses and requiring a TMDL.

The 5.6 mile segment of Green Harbor River (Segment MA94-10) from the outlet of Black Mountain Pond to the tide gate at Route 139, which includes the Site, is designated as a Class B water. Green Harbor River is currently listed on the 2012 Integrated List of Waters as Category 5. Category 5 means that the waters are "impaired or threatened for one or more uses and requiring a Total Maximum Daily Load (TMDL). This segment of the River's "Aquatic Life Use" is impaired by flow alteration (due to the tide gates), noxious plants and turbidity.

The tide gates at Route 139 restrict the natural flow/tidal flushing of this segment of Green Harbor River. Green Harbor, from the tide gates at Route 139 to the mouth of the harbor at Massachusetts Bay, is designated as a Class SA water. Class SA waters are "designated as an excellent habitat for fish, other aquatic life and wildlife and for primary and secondary recreation. In approved areas they shall be suitable for shellfish harvesting without depuration (Open Shellfishing Areas). These waters shall have excellent aesthetic value". A draft TMDL has been prepared for this section of the waterbody.

Green Harbor proper is a Category 5 water that has been impaired by pathogens which negatively affect the shellfishing potential of the Harbor. The cause of the pathogens is likely discharges from municipal storm sewers.



8.6.2 CONSEQUENCES AND MITIGATION

Impacts to water quality would be minimal, temporary, and mitigated via use of Best Management Practices (BMPs). The action alternatives would affect these resources. The potential to impact water quality increases in the event of ground disturbance due to sedimentation caused by erosive forces. This potential would be mitigated by best management practices such as erosion control and soil stabilization using native seeding or other approved means. The extent of soil disturbance is expected to be limited during construction.

Silt socks have been proposed and accepted by the Marshfield Conservation Commission. As the disturbance is limited to impacts directly adjacent to the pole installation, silt socks will be installed in upland areas between the work and the wetlands to prevent unnecessary sedimentation of the wetlands.

8.7 WETLANDS AND SURFACE WATER

8.7.1 AFFECTED ENVIRONMENT

GZA delineated jurisdictional wetland boundaries at the Airport numerous times for various projects over the past 15 years. Wetland resources were delineated most recently in April 2018 and approved by the Marshfield Conservation Commission in October 2020, following current standards established by Massachusetts Department of Environmental Protection (MassDEP) and ACOE.

The Airport property consists of approximately 230 acres of land, of which approximately 170 acres is wetlands. Wetlands associated with the Green Harbor River occupies areas to the south and west of RW 6 and wetlands associated with Bass Creek occupies areas to the south, east and northeast of RW 24. Both wetland areas occupy the majority of land along the southern extents of the Airport runway. In addition, several smaller isolated wetlands occupy areas between the main wetland complexes to the south and the Airport runway.

The wetland systems associated with areas adjacent to the Green Harbor River and Bass Creek consists of primarily of scrub-shrub and forested wetlands, with seasonally saturated to intermittently flooded hydrology. Dominant species include speckled alder, elderberry, highbush blueberry, northern arrowwood, silky dogwood, red maple and grey birch. Wetlands to the west of RW 6 and east of RW 24 are within the previously approved Vegetation Management Plan (VMP) areas of the airfield and are subject to maintenance cutting to remove vegetation every 5-10 years, which keeps these wetlands in a constant state of early succession. Because the light penetration is high from lack of tree canopy, the understory and ground cover are dense and lush with various native sedges, ferns, and forbs. Overall, invasive species occurrence within these wetlands is very low. The principal functional values associated with these wetlands include flood control, mitigation of stormwater flows, and wildlife habitat.

8.7.2 CONSEQUENCES AND MITIGATION

Impacts to wetlands and surface waters will be minimal. Based on the extent of wetlands present at the Airport and required FAA setback requirements, the Proposed Action and the Alternatives will result in unavoidable permanent and/or temporary wetland impacts. The fence would be constructed within a 20-foot wide access corridor to allow access for inspection and maintenance 10 feet on each side; in locations within wetlands, the fence corridor would only allow clearing and vegetation removal via the use of small equipment and on foot. Brush and trees would be cut flush with the ground and mowed or cleared by hand.

The proposed wetland impacts for the proposed Alternatives I-III are presented below in Table 5.



Table 5. Wetland Impacts by Alternatives

Alternative	Permanent
Alternative I – No Build	0 SF / 0 LF
Alternative II – Partial Build (50%)	RW 6-End Only: 1,069 LF from Fence Fabric, 6 SF from Fence Posts, and 74 SF from 37 Foot Turtle Gates or RW-24 End Only: 2,253 LF from Fence Fabric, and 12 SF from Fence Posts or Northern Fence Replacement Only: 943 LF from Fence Fabric and 6 Sf from Fence Posts
Alternative III - Complete Build (Preferred)	5,510 LF 6-End, 24-End, Northern Fence Replacement also 37 Foot Turtle Gates (2SF/Gate = 74 SF) also 431 Posts (0.05 SF/Post = 21.55 SF)

Because of the extent of wetlands present on Airport property, and their close proximity to aircraft operating areas and required safety areas, opportunities to avoid permanent and temporary wetland disturbances, and meet the project's purpose and need are limited.

Permanent and temporary jurisdictional wetland impacts would be minimal and limited to the footprint of the fence poles, access road and bridge, and timber matting. Details are illustrated on the Project Plans provided in Appendix B.

Alternative III – Complete Build would result in a total of approximately 5,510 LF 6-End, 24-End, Northern Fence Replacement and also 37 Foot Turtle Gates (2SF/Gate = 74 SF) and also 431 Posts (0.05 SF/Post = 21.55 SF) and would satisfy the Purpose and Need of the Project.

Alternative I – No Build would result in no impacts but would fail to satisfy the Purpose and Need of the Project.



Alternative II – Partial Build would partially satisfy the Purpose and Need but would allow alternative passage of hazardous wildlife into the sensitive areas of the Airport and not serve to reduce the possibility of collision with aircraft by wildlife to a degree which would maximize safety for airport staff, pilots, and animals themselves.

The clearing or removal of vegetation for the installation of the fencing and bridge, as well as long-term vegetation cutting/removal for maintenance of the fence line to allow for structural upkeep, visibility, and deter wildlife foraging would be considered a secondary impact. Alternative III would create secondary wetland impacts yet may differ slightly due to changes from site-specific field conditions during fence installation.

Federally-Regulated Wetland Impacts

The clearing or removal of vegetation within wetlands for development of the access corridor, as well as long-term vegetation cutting/removal for maintenance of the fence and access corridor to allow for structural upkeep and visibility is a secondary jurisdictional impact.

Mitigation

Mitigation has been established as a condition of agency (local / MassDEP) permits. The following is an excerpt from the Notice of Intent submitted and approved by the Marshfield Conservation Commission in October 2020. The plans in Appendix B also contain mitigation details:

“In accordance with Chapter 505-10 (F), mitigation in kind for alterations within wetland resource areas will be performed as set forth in 310 CMR 10.55(4)(b).

The Wetlands Protection Act requires the loss of BVW to be replaced if unavoidable. FAA setbacks as described above, required that fence be installed in BVW in some areas around the airport. These impacts are unavoidable. The replacement of the lost BVW for this project will occur on Airport owned property. The mitigation area referenced as Wetland Creation Area accounts for a >5:1 replacement for BVW loss associated with the Project. This Area includes an upland area adjacent to a small pond located to the south of the runway. It will create a 500+ SF shelf of new BVW by the removal of up to 1 foot of upland soils and creation of wetlands at equal grade to existing wetlands next to it. Following excavation of material, this area will be prepared with 12” of organic topsoil (sandy loam) and planted with native wetland shrubs, highbush blueberry, silky dogwood, sweet pepperbush, meadow sweet, and seeded with New England Wetland Seed Mix; the buffer to the new BVW will be planted with sweetfern and sweet bay, and seeded with New England Conservation / Wildlife seed mix. The final result of the creation will be a herbaceous to shrub-dominated wetland system similar to the adjoining wetland system to the south. A wetland scientist will monitor the creation of the new wetland. The contractor will ensure that erosion and sediment controls will be installed to prevent the migration of upland sediment into the new wetland while construction is occurring.”

8.8 SECONDARY AND CUMULATIVE IMPACTS

8.8.1 AFFECTED ENVIRONMENT

FAA Order 5050.4A Airport Environmental Handbook describes criteria for considering induced impacts as:

“(4) Induced Socioeconomic Impacts. For major airport development proposals there is the potential for induced or secondary impacts on surrounding communities. When such potential exists, the [analysis] shall describe in general



terms such factors as shifts in patterns of population movement and growth, public service demands, and changes in business and economic activity to the extent influenced by the airport development. Induced impacts will normally not be significant except where there are also significant impacts in other categories, especially noise, land use or direct social impacts. In such circumstances, a more thorough analysis of induced effects may be needed in an environmental impact statement.”

Major airport development projects would consider induced impacts on the region, the Airport does not believe that the installation of wildlife fencing nor a small access bridge, both to be used exclusively by the Airport and will not be generally available for public use, would result in induced impacts to the local population nor the population of the region. This project will serve to enhance security at the Airport and to provide access for emergency services and for vegetation management purposes.

The Council on Environmental Quality (CEQ) Regulations defines a cumulative impact as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (see 40 CFR § 1508.7).

To complete the cumulative analysis for this project, critical background information of past, present, and reasonably foreseeable future actions was reviewed. Cumulative effects may result from individually minor but collectively significant actions taken place over a period of time. Due to the limited location of the proposed project, in combination with security and access concerns regarding airport-owned lands, the cumulative effects analysis is limited to the property directly affected by the proposed project. The Airport does not consider secondary and cumulative impacts to be large enough to believe the project will impact negatively the local environment nor the population as a whole in proximity to Airport property. As of this time there are al no reasonably foreseeable future activities planned by the Airport.

8.8.2 CONSEQUENCES AND MITIGATION

Cumulative effects may result from individually minor but collectively significant actions taken place over a period of time. Mitigation for the previous improvements to the airport reduces the effect of cumulative impacts. The most recent airport development project was the runway realignment and extension dating back to 2013-2014. During that project, all impacts to wetlands and rare and endangered habitat were mitigated for, resulting in an increase turtle breeding habitat.



9.0 LIST OF AGENCIES CONTACTED AND PERSON CONSULTED, EA PREPARERS

The following were contacted during the environmental analysis process and provided materials, comments or information that was incorporated into the EA.

Table 6. List of Agency / Organization Contacts

Agency / Organization	Contact
US Army Corps of Engineers	Katelyn M. Rainville
US Fish and Wildlife Service	IPaC Online Submission
Federal Aviation Administration	Richard Doucette
Massachusetts Office of Coastal Zone Management	Federal Consistency Review Program
Indian Tribe	Mashpee Wampanoag Tribe
Massachusetts Historical Commission	Central Office
MassDOT Aeronautics Division	Nathan Rawding
Massachusetts Department of Environmental Protection	Southeast Region
Town of Marshfield, MA	Conservation Commission

Table 9. List of EA Preparers

Name of Person	Affiliation
Stephen Lecco, AICP, CEP	GZA GeoEnvironmental Inc.
Seth Taylor, CEP, CESSWI, CIPM ^{RI, MA}	GZA GeoEnvironmental Inc.
Patrick Lord	GZA GeoEnvironmental Inc.
Stephen Rielsand, P.E.	Airport Solutions Group
Craig Schuster, P.E.	Airport Solutions Group



10.0 REFERENCES

Eastern Coyote (*Canis latrans*). <https://www.massaudubon.org/learn/nature-wildlife/mammals/coyotes>

Federal Aviation Administration National Part 139 CertAlert No. 16-03. US DOT: FAA. Effective Date 8/03/2016.

Federal Aviation Administration Order 1050.1F: Environmental Impacts: Policies and Procedures. US DOT: FAA. Effective Date 7/16/2015.

Federal Aviation Administration Order 5050.4B: National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions. Effective April 28, 2006

Federal Aviation Administration. Wildlife Strike Database. Accessed January 2020.

FAA Section 4(f) Properties Tutorial. https://www.environment.fhwa.dot.gov/env_topics/4f_tutorial/properties.aspx

Federal Emergency Management Agency Flood Insurance Study. Plymouth County, Massachusetts (All Jurisdictions). Volumes 1, 2, 3 and 4. Revised November 4, 2016. Flood Insurance Study Numbers 25023CV001C, 25023CV002C, 25023CV003C, and 25023CV004C.

Mass Audubon Daniel Webster Wildlife Sanctuary. <https://www.massaudubon.org/get-outdoors/wildlife-sanctuaries/daniel-webster>

Massachusetts Natural Heritage & Endangered Species Program Eastern Box Turtle (*Terrapene carolina*) Fact Sheet. 2015

Marshfield Municipal Airport George Harlow Field, Wildlife Hazard Assessment, December 2018. DRAFT.

National Plan of Integrated Airport Systems (NPIAS) – Airports (2019-2023)

U.S. Fish and Wildlife Service, National Wetlands Index Mapper, accessed January 2020.

U.S. Fish and Wildlife Service, Information for Planning and Consultation, accessed January 2020.

U.S. Council on Environmental Quality, Considering Cumulative Effects Under the National Environmental Policy Act. January 1988.

White-tailed Deer (*Odocoileus virginianus*) Management in Massachusetts. <https://www.mass.gov/service-details/deer-management>



Appendix A

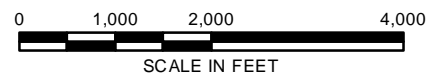
Figures

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**MARSHFIELD MUNICIPAL AIRPORT WILDLIFE HAZARD
MANAGEMENT/ PERIMETER FENCING**
93 OLD COLONY LANE
MARSHFIELD, MA

**NOTICE OF INTENT
LOCUS MAP**

PREPARED BY:  GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: AIRPORT SOLUTIONS GROUP, LLC 39 WINN STEET BURLINGTON, MA 01803	
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DATE: 08/21/2020	PROJECT NO: 15.0166669.01	REVISION NO: REVISION NO: 01 OF 04	

Legend

— Proposed Fencing



PROPOSED FENCING AT RW 24

PROPOSED FENCING AT RW 6

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Feet

**MARSHFIELD MUNICIPAL AIRPORT WILDLIFE HAZARD
MANAGEMENT/ PERIMETER FENCING**
93 OLD COLONY LANE
MARSHFIELD, MA

PREPARED BY:



GZA GeoEnvironmental, Inc.
Engineers and Scientists
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PREPARED FOR:

AIRPORT SOLUTIONS GROUP, LLC
39 WINN STREET
BURLINGTON, MA 01803

PROJ MGR:

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REVIEWED BY:

SLL

CHECKED BY:

SDR

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DESIGNED BY:

JRC

DRAWN BY:

JRC

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PROJECT NO:

15.0166669.01

REVISION NO:

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NOTICE OF INTENT AERIAL MAP

Legend

FEMA National Flood Hazard Layer

Flood Zone Designations

- AE: 1% Annual Chance of Flooding, with BFE
- VE: High Risk Coastal Area



SITE

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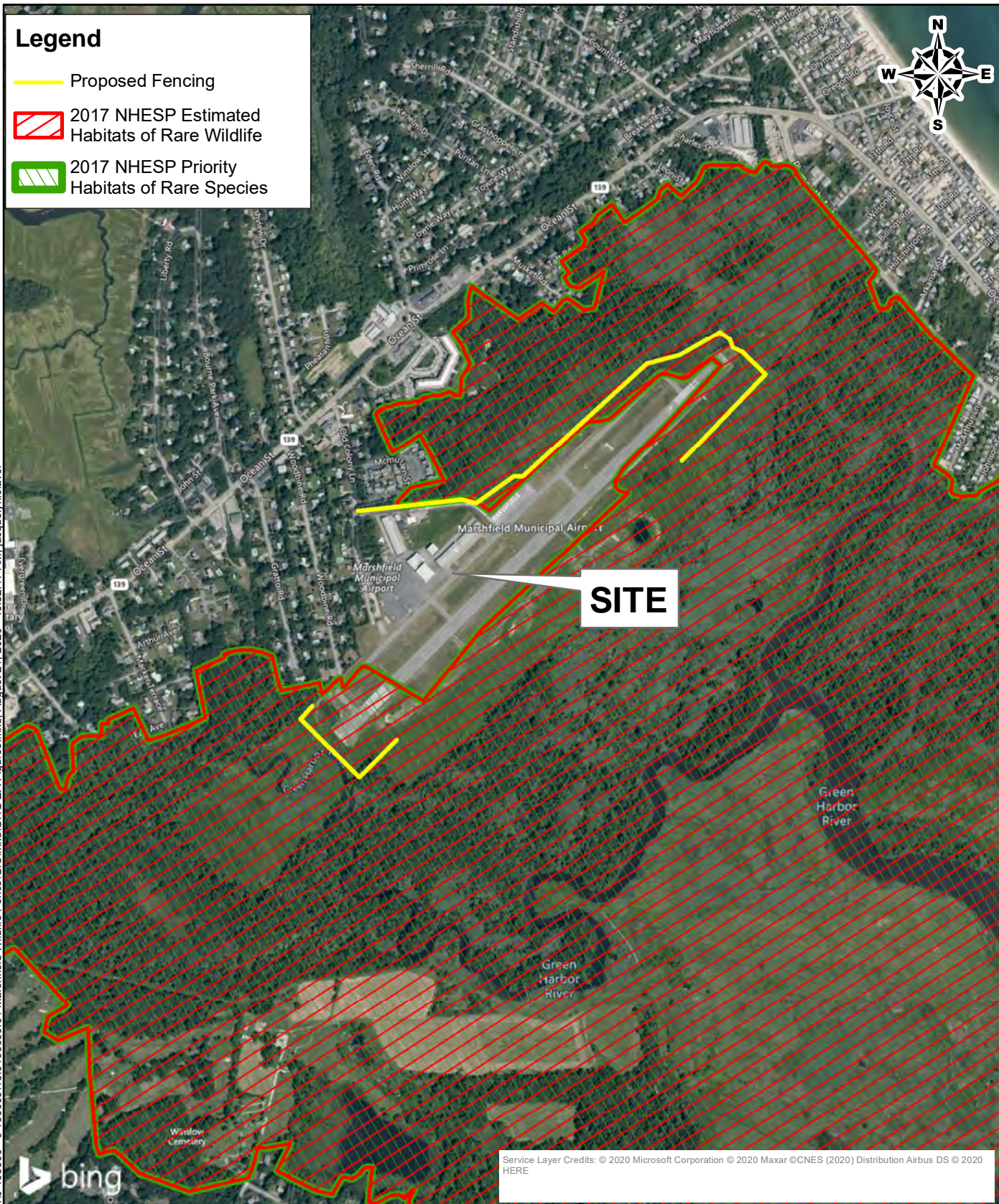
03 OF 04

Legend

- Proposed Fencing
- ▨ 2017 NHESP Estimated Habitats of Rare Wildlife
- ▨ 2017 NHESP Priority Habitats of Rare Species



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04 OF 04



Appendix B

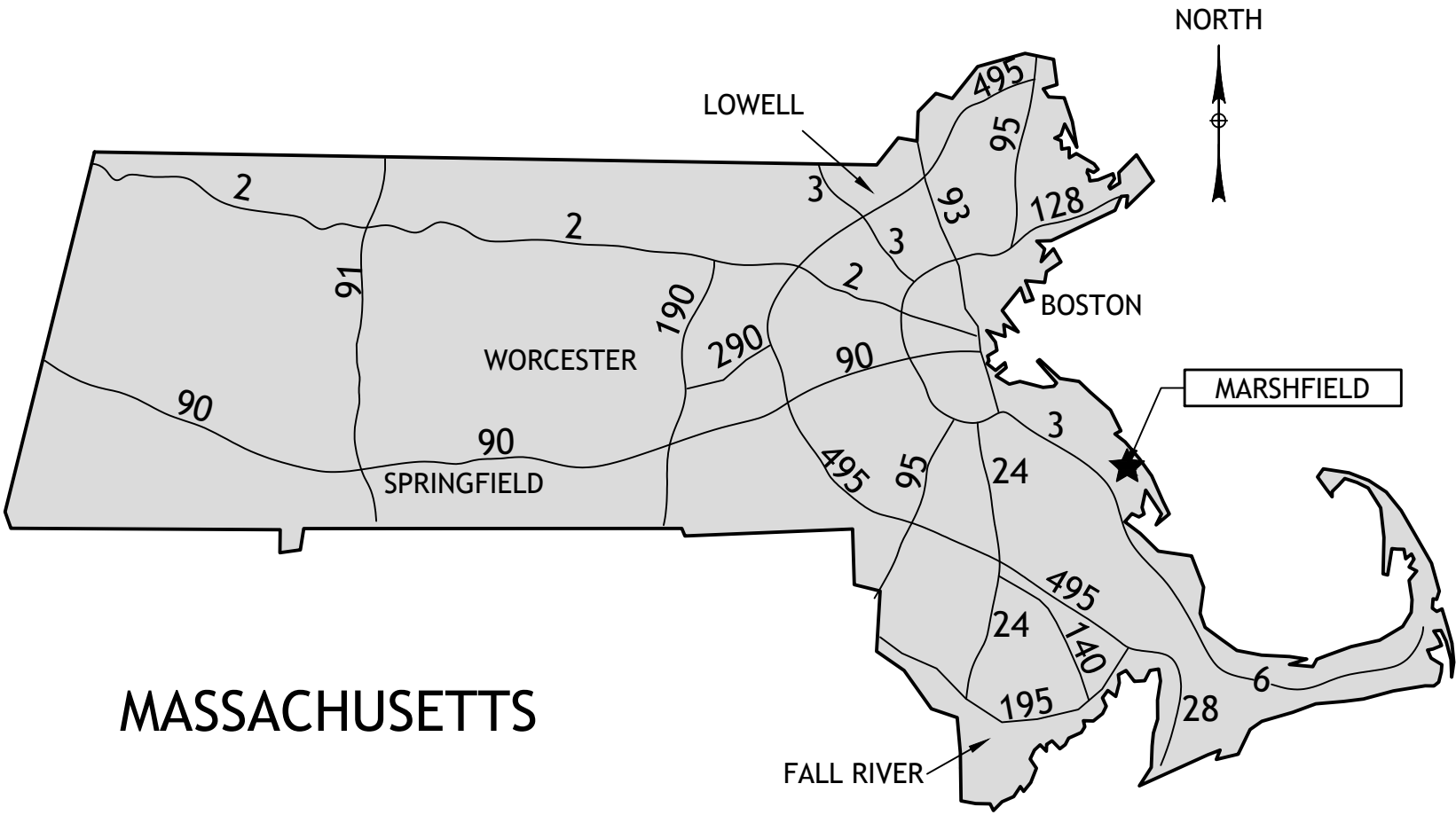
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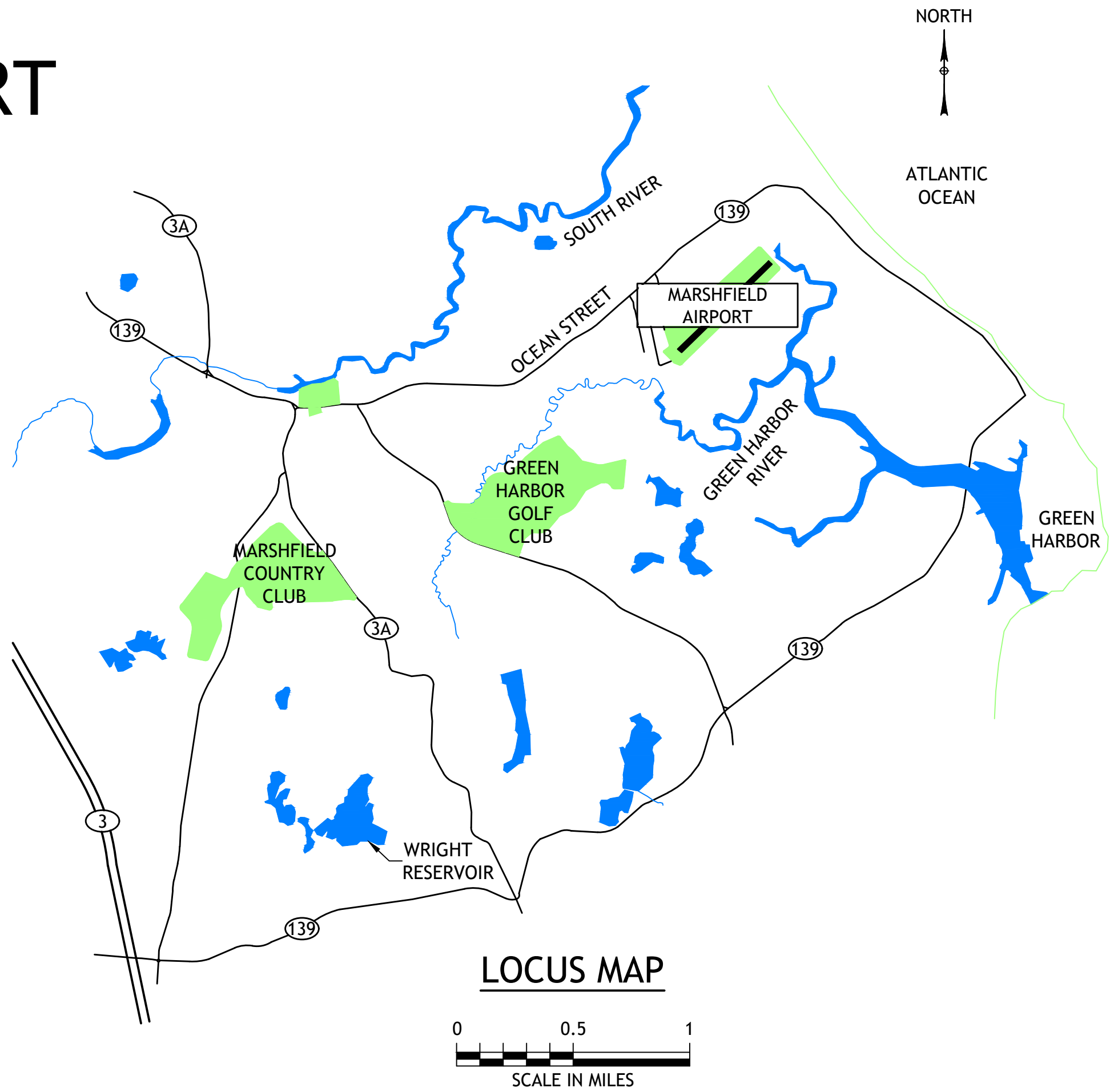
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GEORGE HARLOW FIELD - MARSHFIELD AIRPORT

WILDLIFE MANAGEMENT/
SECURITY FENCE

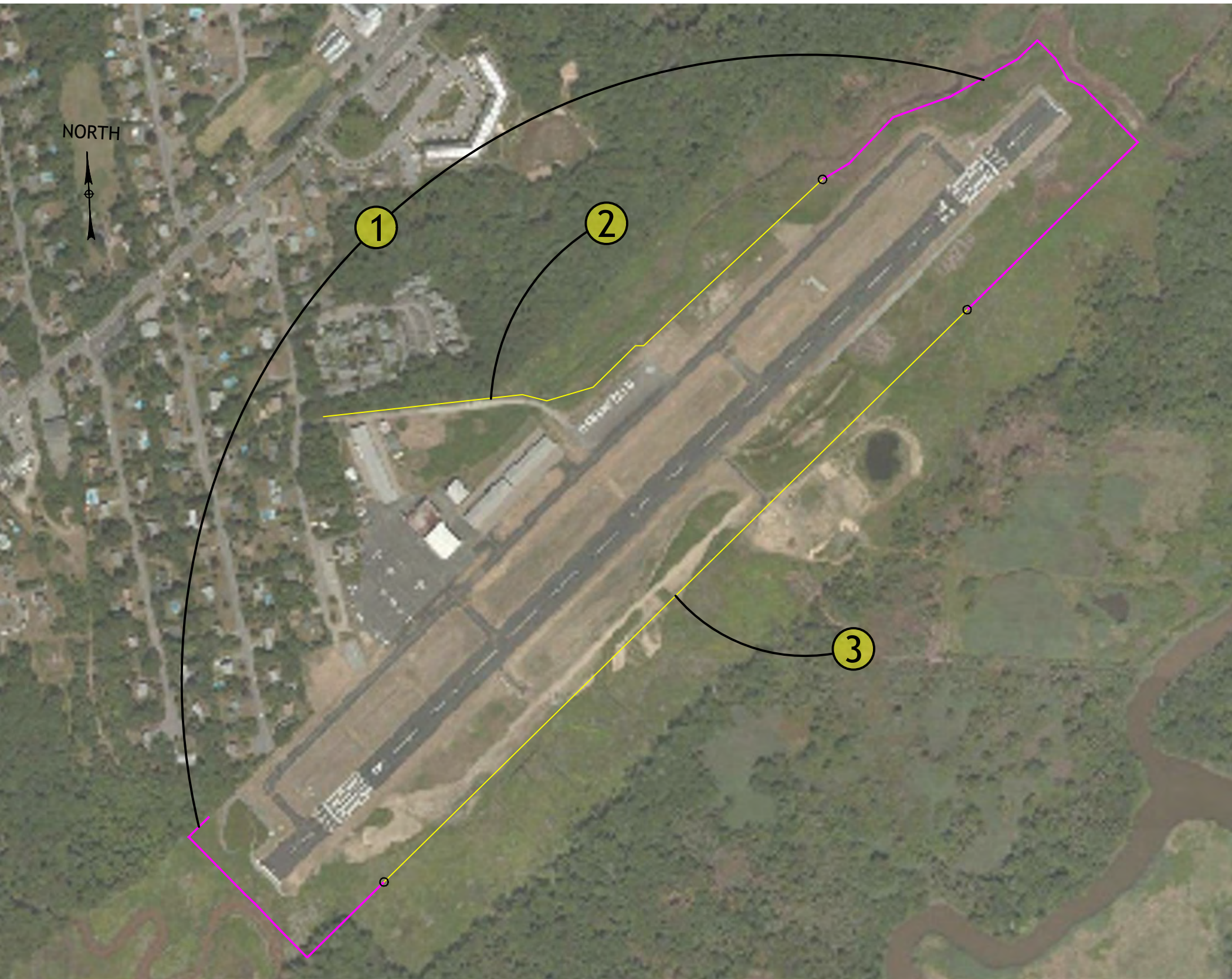
AUGUST 2020
AIP NO. 3-25-0030-029-2018



LOCATION MAP



INDEX		
SHEET NO.	DWG.No.	SHEET TITLE
1	NOI.1	COVER SHEET
2	NOI.2	WILDLIFE MANAGEMENT/SECURITY FENCE PLAN (1 OF 5)
3	NOI.3	WILDLIFE MANAGEMENT/SECURITY FENCE PLAN (2 OF 5)
4	NOI.4	WILDLIFE MANAGEMENT/SECURITY FENCE PLAN (3 OF 5)
5	NOI.5	WILDLIFE MANAGEMENT/SECURITY FENCE PLAN (4 OF 5)
6	NOI.6	RARE SPECIES IMPACT PLAN (5 OF 5)
7	NOI.7	WILDLIFE MANAGEMENT/SECURITY FENCE DETAILS
8	NOI.8	REPLICATION PLANTING & GRADING PLAN



PROPOSED CONSTRUCTION

- ① - INSTALL WILDLIFE MANAGEMENT/SECURITY FENCE BEYOND THE ENDS OF RUNWAY 6-24
- ② - REPLACE EXISTING WILDLIFE MANAGEMENT/SECURITY FENCE ALONG NORTH PROPERTY LINE
- ③ - EXISTING WILDLIFE FENCE

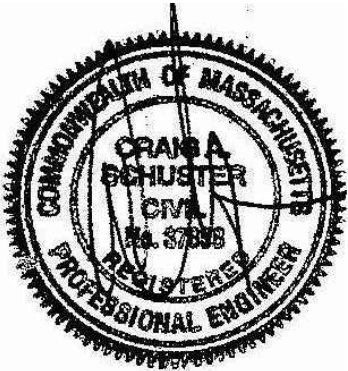
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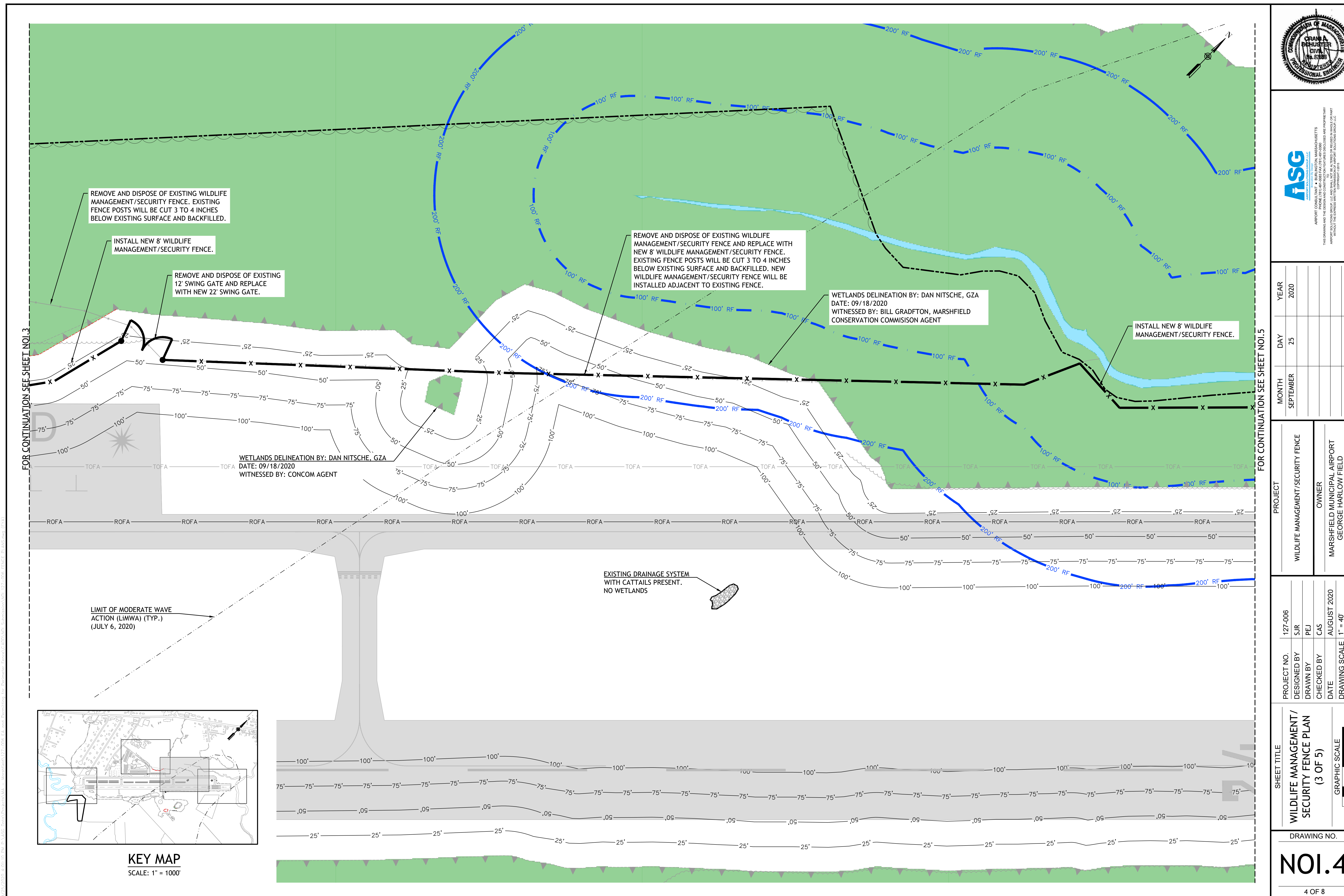


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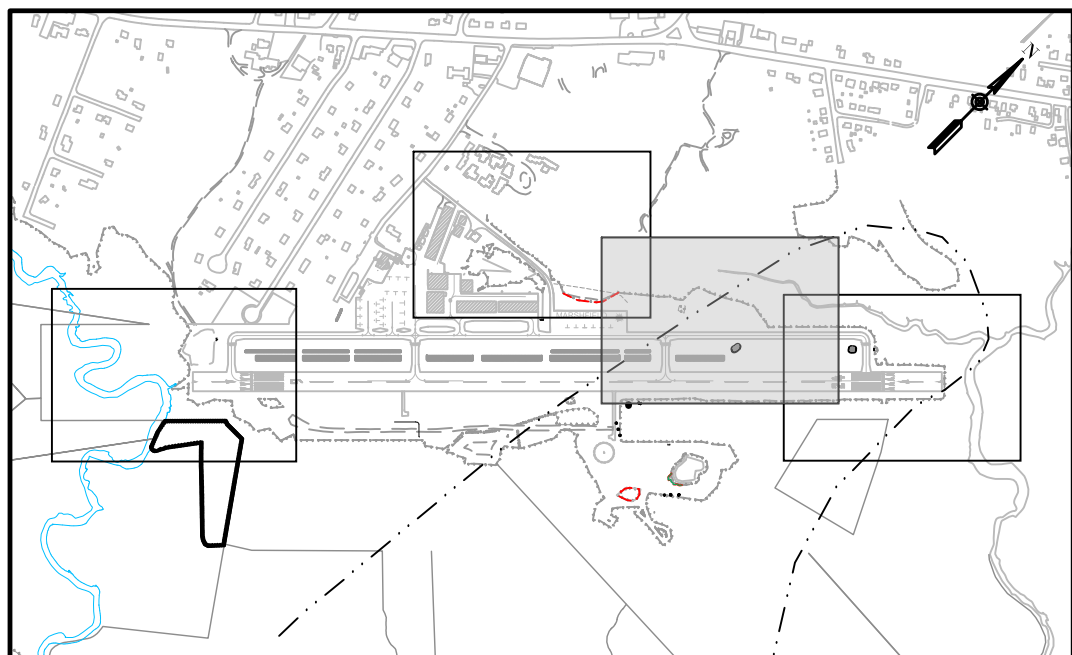


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NOI.1
1 OF 8



FOR CONTINUATION SEE SHEET NOI.3

FOR CONTINUATION SEE SHEET NOI.5



KEY MAP
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MONTH	DAY	YEAR
SEPTEMBER	25	2020

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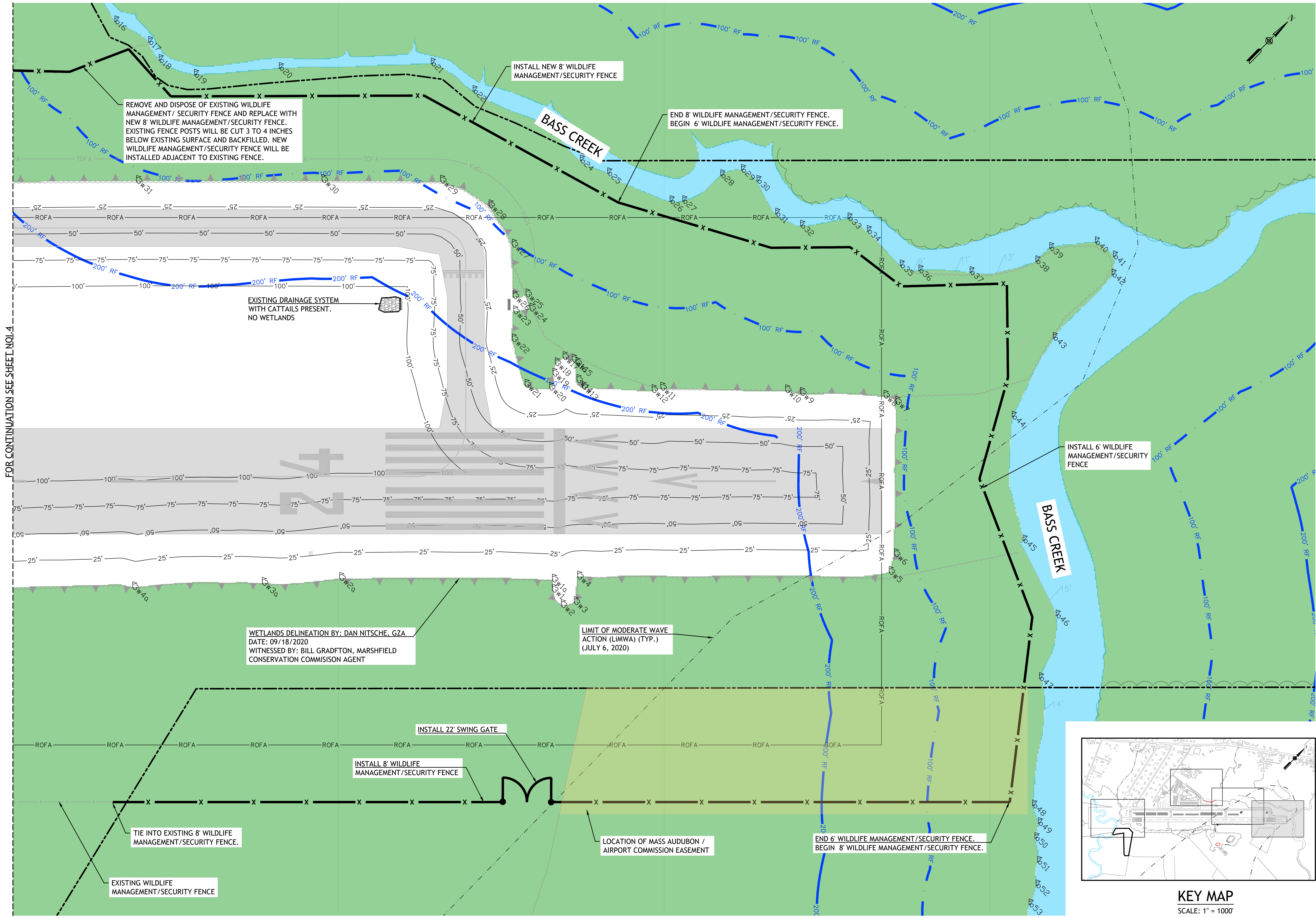
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CHECKED BY	CAS
DATE	AUGUST 2020
DRAWING SCALE	1" = 40'

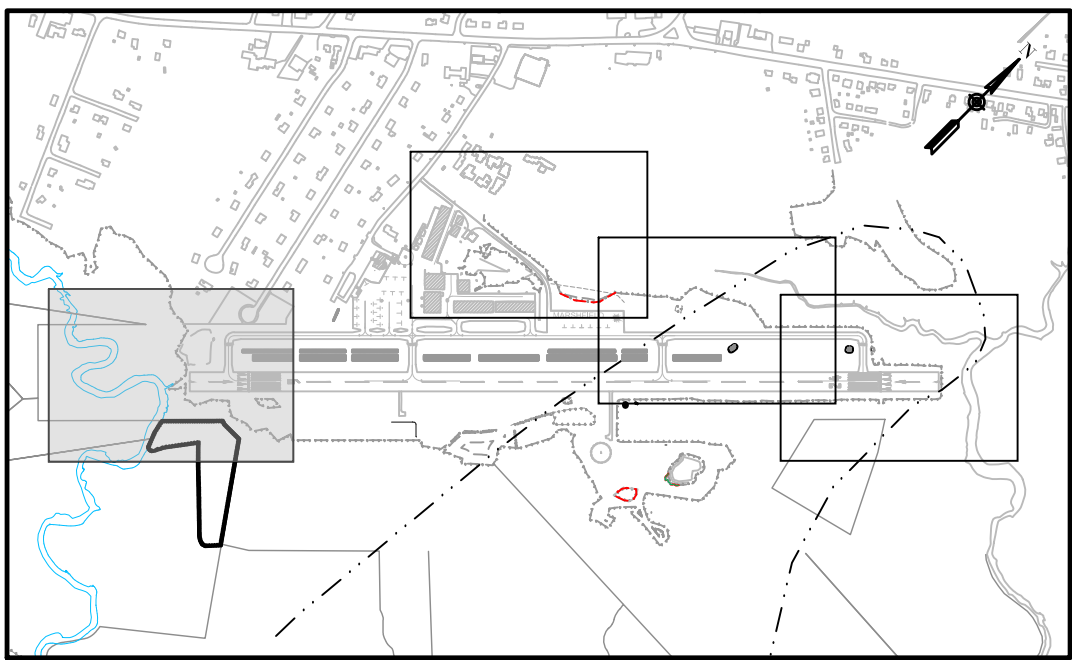
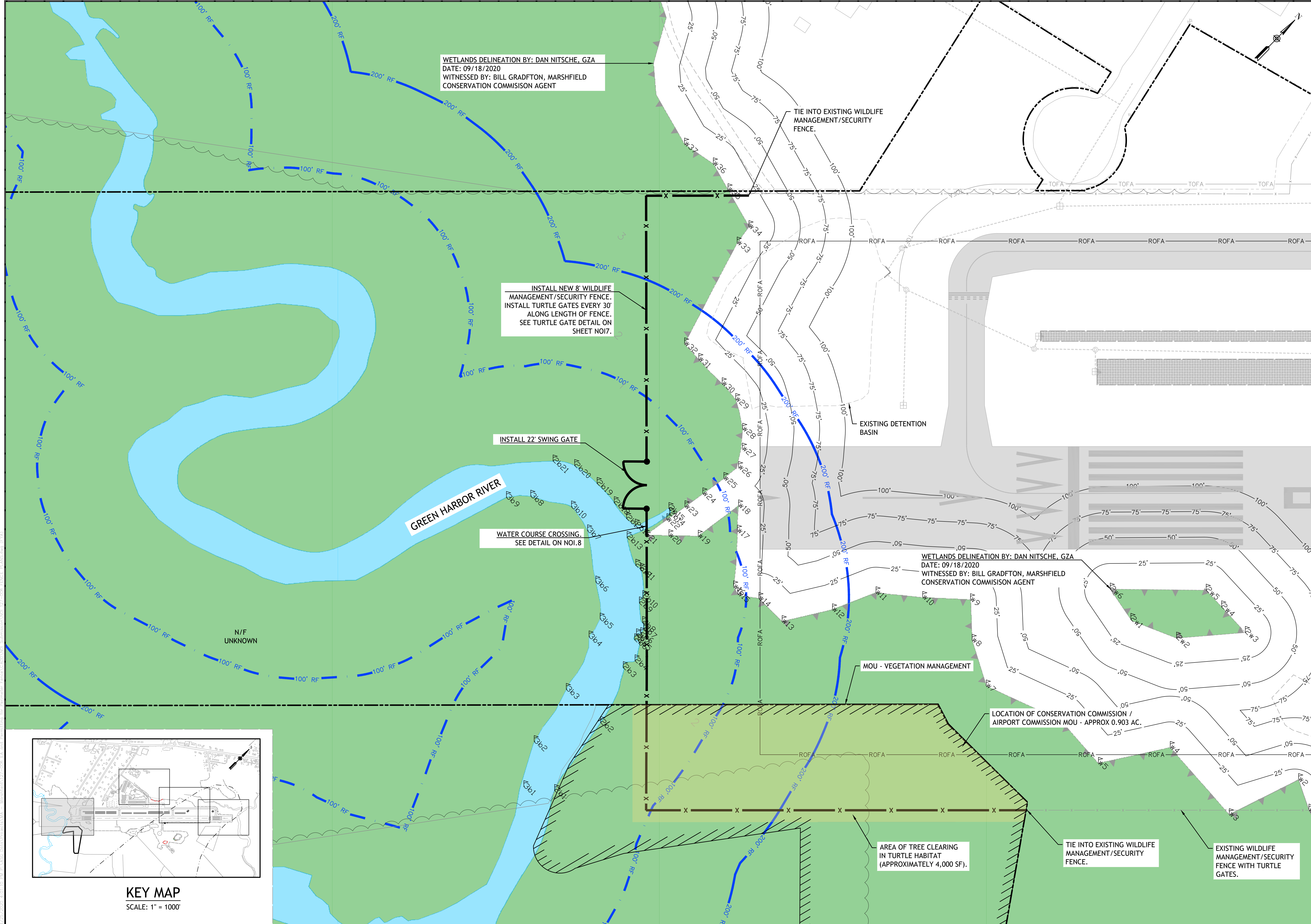
SHEET TITLE
WILDLIFE MANAGEMENT / SECURITY FENCE PLAN (3 OF 5)

DRAWING NO.
NOI.4
4 OF 8

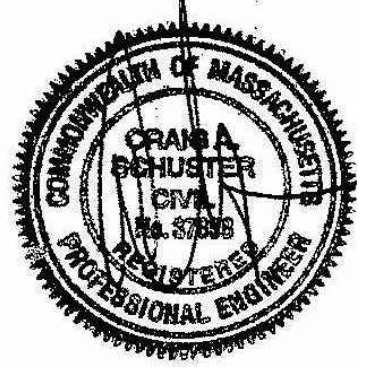


FOR CONTINUATION SEE SHEET NOI.4





KEY MAP
SCALE: 1" = 1000'



ASG
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PHONE: (781) 440-0000 FAX: (781) 440-0001
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YEAR	2020
DAY	25
MONTH	SEPTEMBER

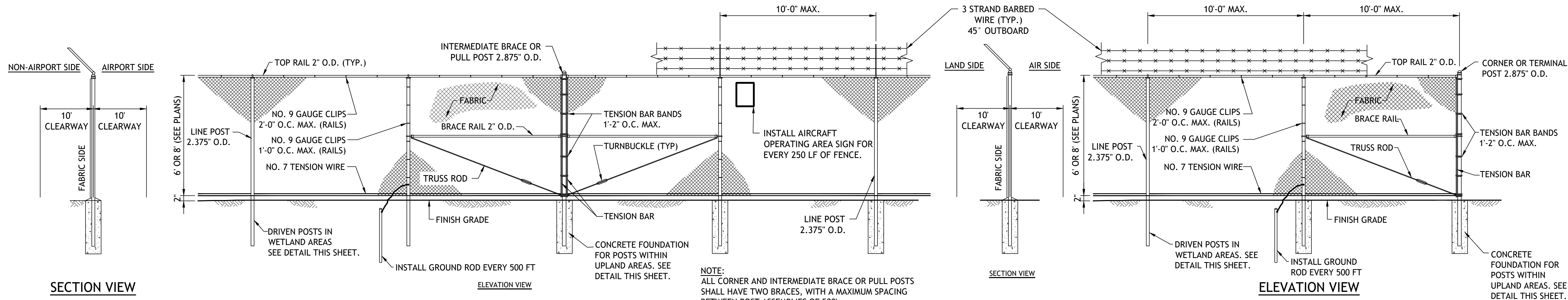
PROJECT	WILDLIFE MANAGEMENT/SECURITY FENCE
OWNER	MARSHFIELD MUNICIPAL AIRPORT GEORGE HARLOW FIELD 88 OLD COLONY LANE, MARSHFIELD, MA 02850

PROJECT NO.	12T-006
DESIGNED BY	SJR
DRAWN BY	PEJ
CHECKED BY	CAS
DATE	AUGUST 2020
DRAWING SCALE	1" = 40'

SHEET TITLE	RARE SPECIES IMPACT PLAN (5 OF 5)
GRAPHIC SCALE	0' 20' 40' 80'

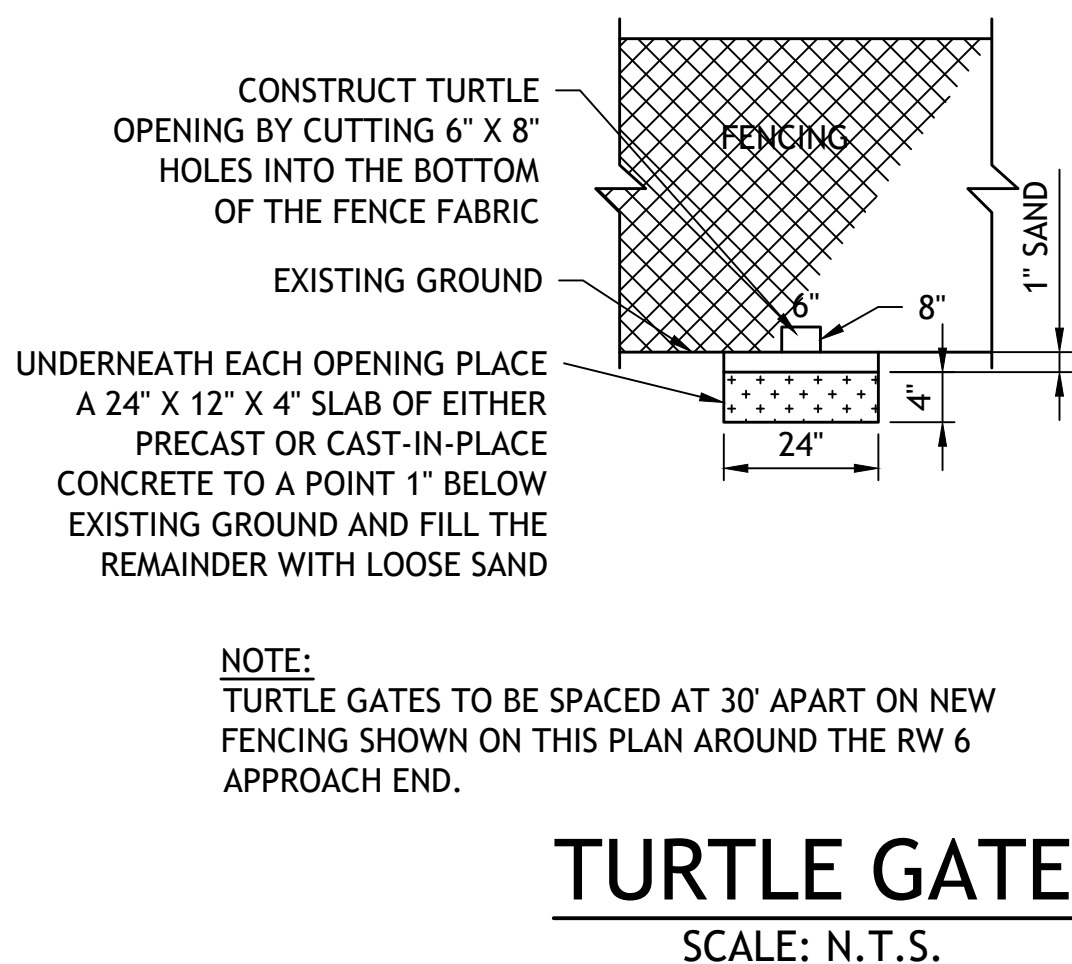
DRAWING NO.
NOI.6
6 OF 8

8/21/2020 10:50:14 AM P:\ASG Data\Projects\MA - Marshfield\127-006 EA and Permitting for Permanent Fencing\127-006 DETAILS NEW.dwg (1243)

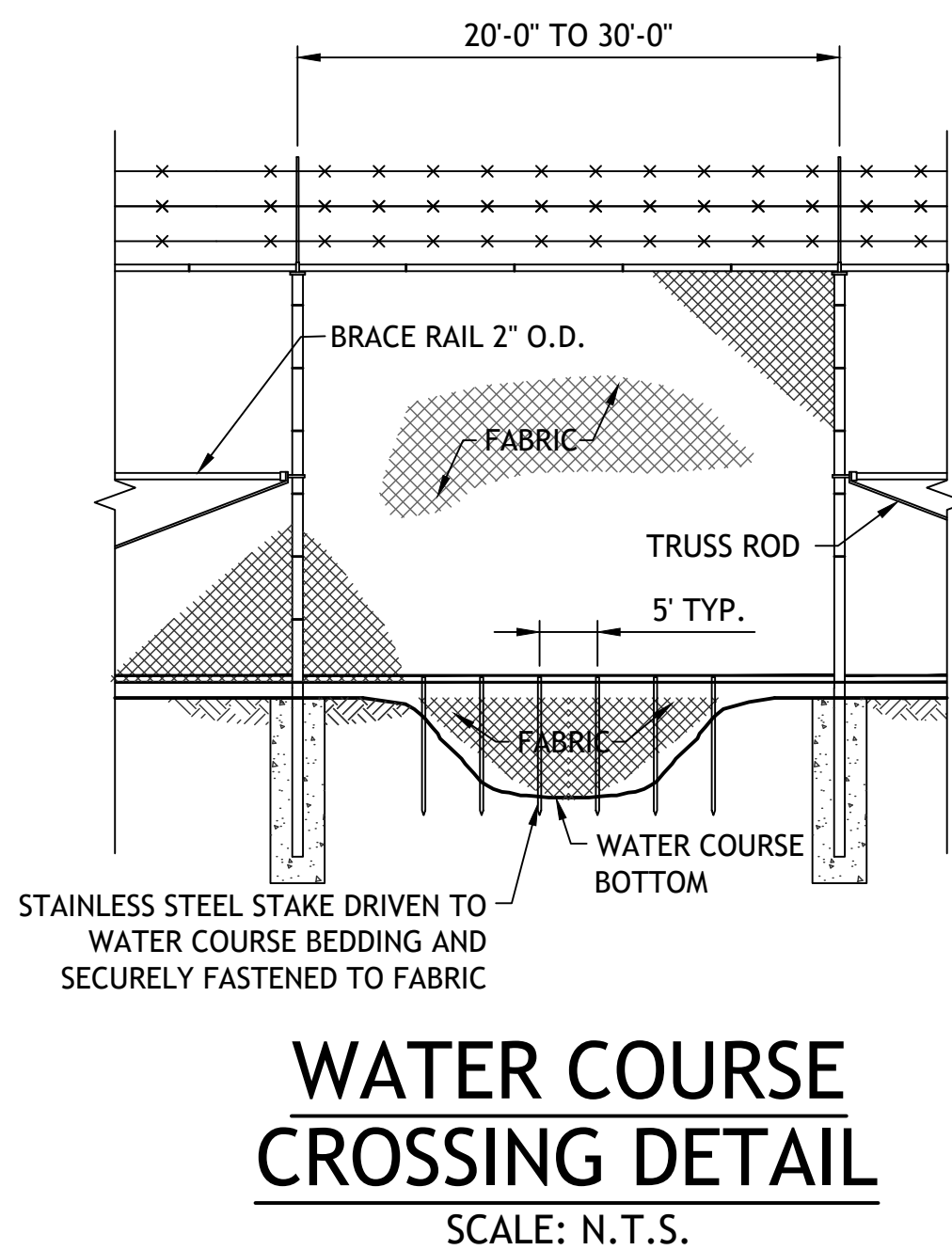


CHAIN LINK FENCE AND INTERMEDIATE POST ASSEMBLY DETAIL
SCALE: N.T.S.

CORNER AND TERMINAL POST ASSEMBLY DETAIL
SCALE: N.T.S.



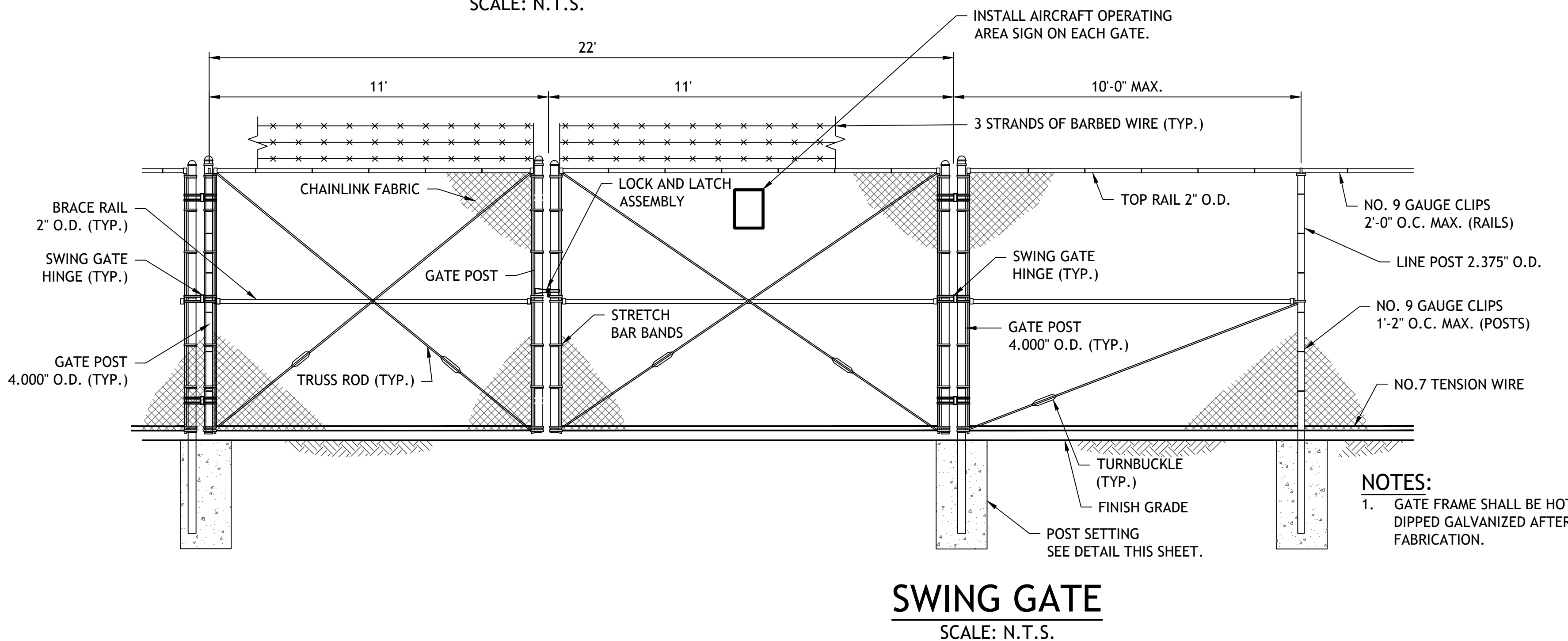
TURTLE GATE
SCALE: N.T.S.



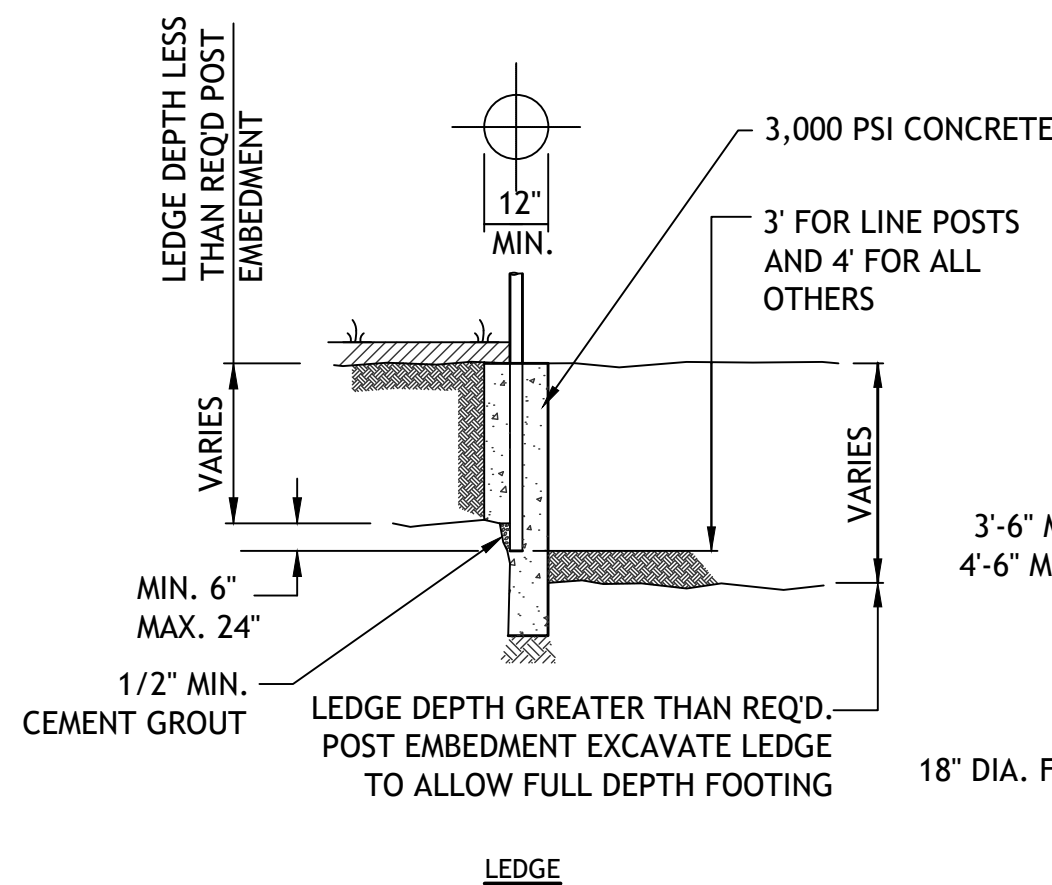
WATER COURSE CROSSING DETAIL
SCALE: N.T.S.

WILDLIFE MANAGEMENT/SECURITY FENCE

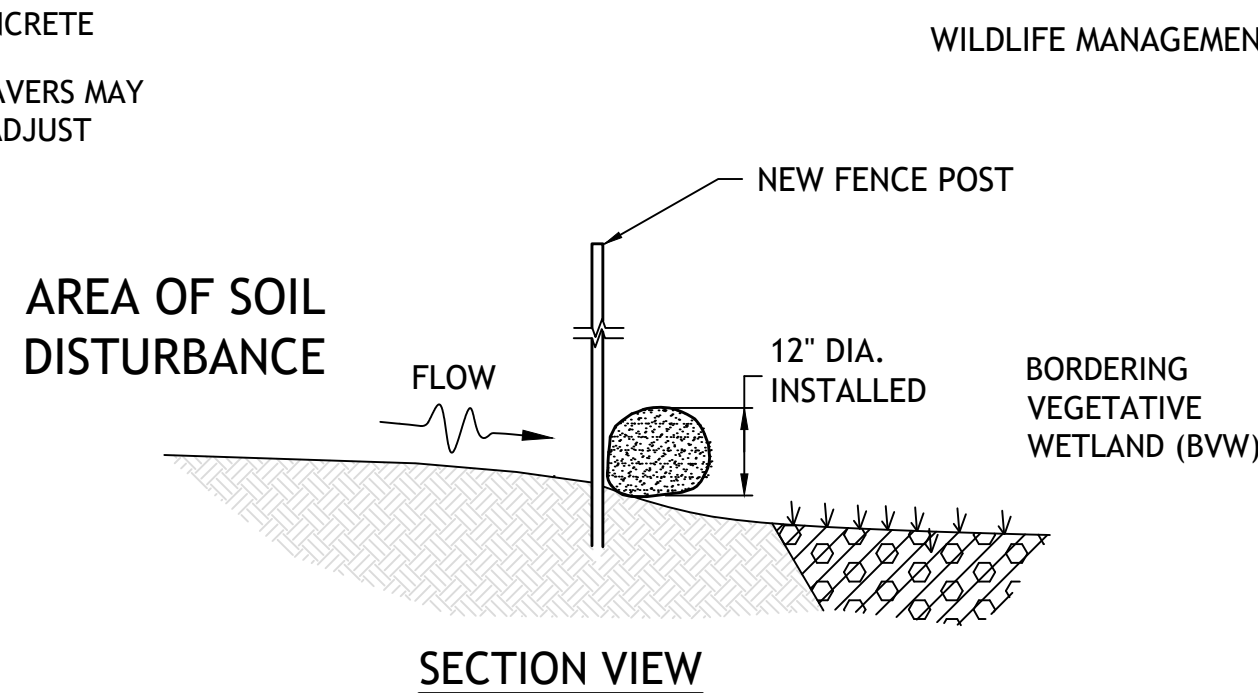
SCALE: N.T.S.



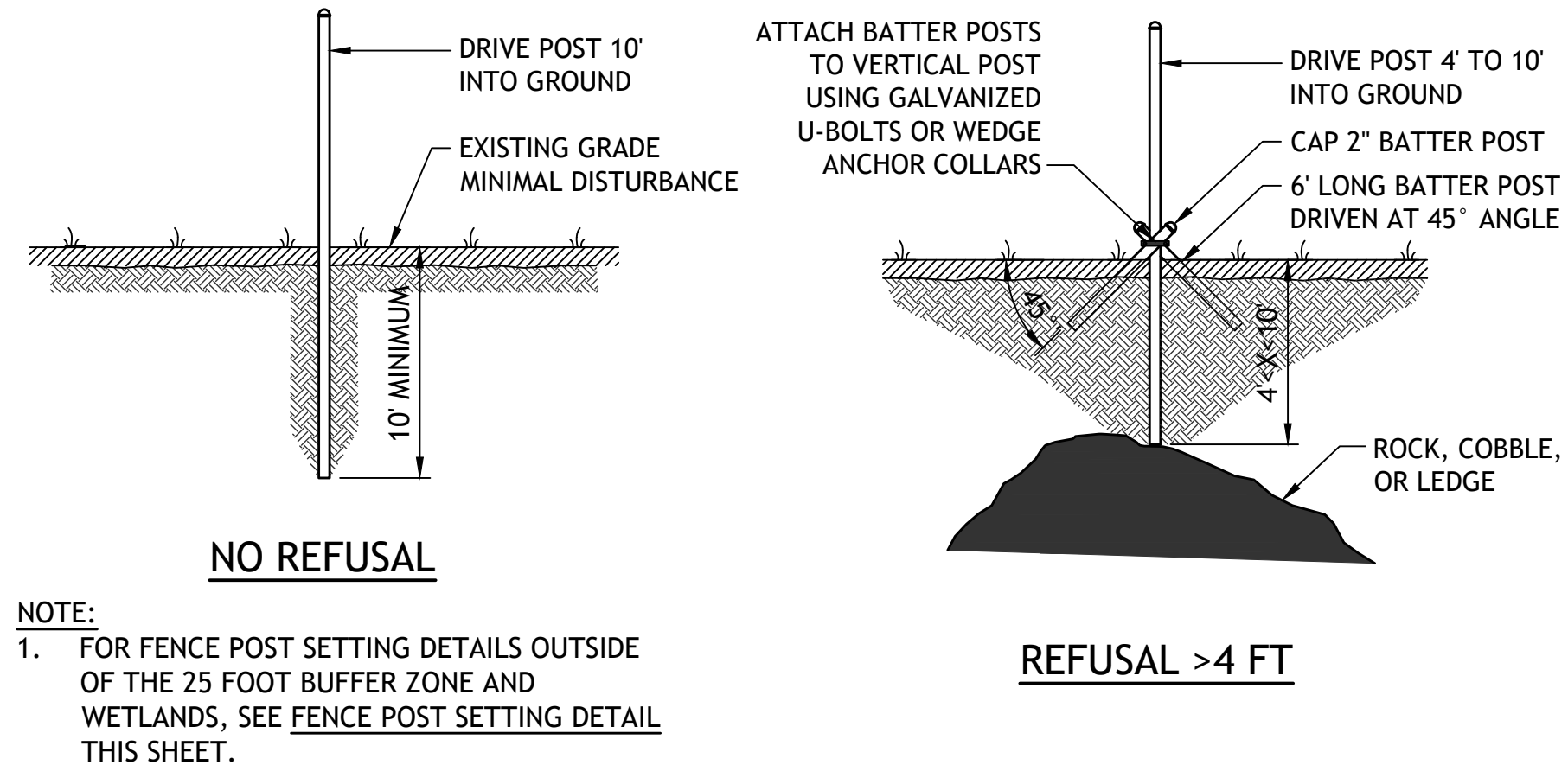
SWING GATE
SCALE: N.T.S.



POST SETTING WITHIN 200' RF; 100 RF;
100' BUFFER; 75' BUFFER; AND 50' BUFFER.
(NOT IN 25' BUFFER AND WETLANDS)
SCALE: N.T.S.



STRAW WATTLES
SCALE: N.T.S.



FENCE POST SETTING DETAILS
WITHIN 25-FOOT BUFFER ZONE AND WETLANDS
SCALE: N.T.S.

YEAR	2020
DAY	25
MONTH	SEPTEMBER

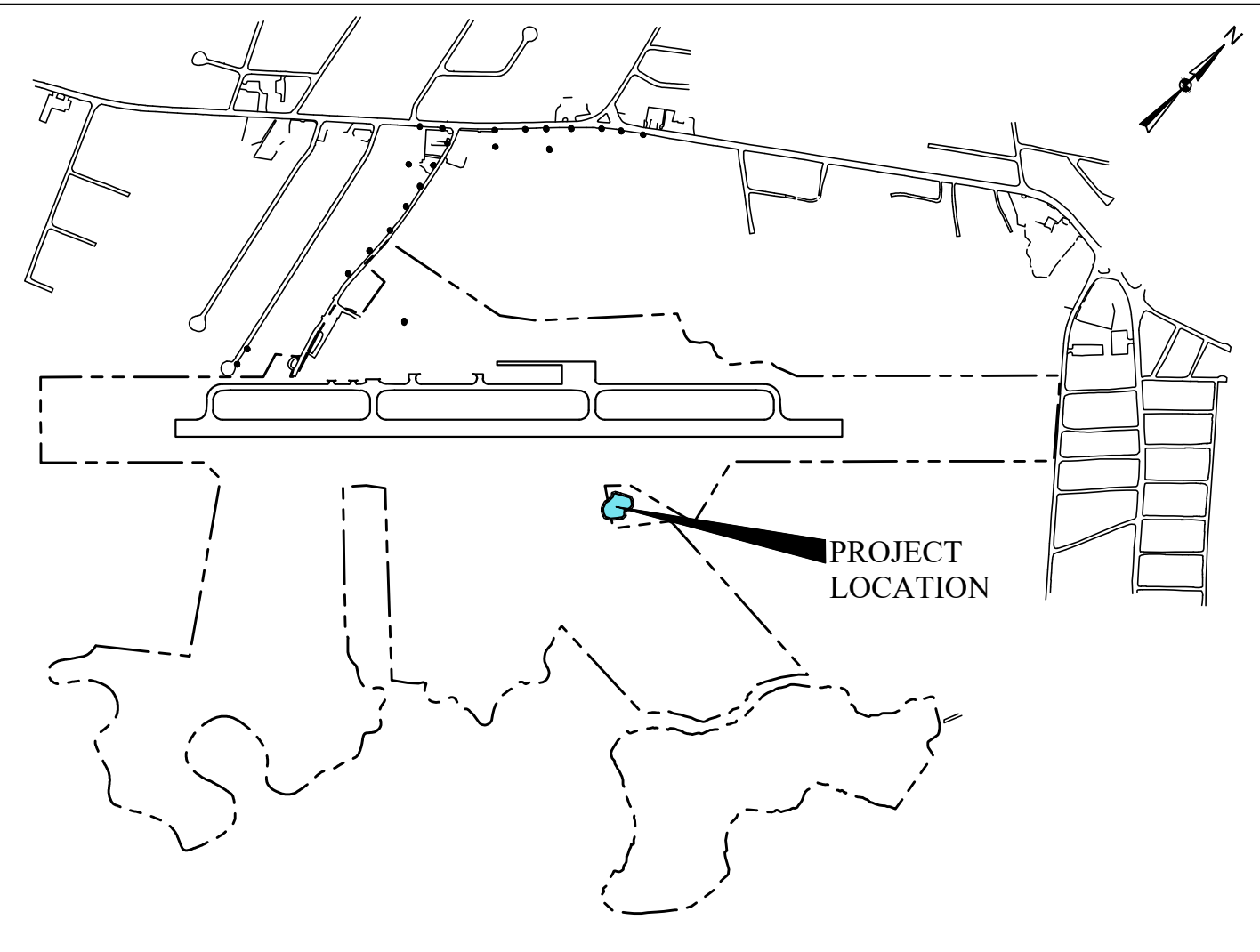
PROJECT	WILDLIFE MANAGEMENT/SECURITY FENCE
OWNER	MARSHFIELD MUNICIPAL AIRPORT GEORGE HARLOW FIELD 93 OLD COLONY LANE, MARSHFIELD, MA 02050

PROJECT NO.	127-006
DESIGNED BY	
DRAWN BY	
CHECKED BY	
DATE	AUGUST 2020
DRAWING SCALE	

SHEET TITLE	WILDLIFE MANAGEMENT/ SECURITY FENCE DETAILS
DRAWING NO.	



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PROJECT TIMING:
THE PROPOSED WORK ON THE WETLAND REPLACEMENT SITES WILL BEGIN AFTER THE FROST IS OUT OF THE GROUND DURING THE CONSTRUCTION YEAR. SHRUB AND TREE PLANTINGS MAY OCCUR UP UNTIL NOVEMBER 1ST OF THAT YEAR.

1. **WETLAND SPECIALIST:**
PRIOR TO THE START OF CONSTRUCTION A WETLAND SPECIALIST SHALL BE DESIGNATED AND RETAINED FOR THIS PROJECT BY THE ENGINEER. SAID WETLAND SPECIALIST SHALL BE APPROVED BY THE CONSERVATION COMMISSION TO OVERSEE THE CONSTRUCTION AND FOLLOW-UP MONITORING. ALL WORK ASSOCIATED WITH WETLAND REPLICATION AREAS SHALL BE COORDINATED WITH THE WETLAND SPECIALIST.

2. **EROSION AND SEDIMENTATION CONTROLS:**
THE CONTRACTOR SHALL PLAN AND EXECUTE OPERATIONS IN A MANNER THAT AVOIDS THE WASHING OF EXCAVATED MATERIALS TO AND FILLS IN THE WETLAND. COMPOST FILTER SOCKS SHALL BE USED AROUND THE ENTIRE PERIMETER OF THE MITIGATION SITE AND THE SOIL STOCKPILE AREAS. EROSION CONTROLS WILL BE MAINTAINED THROUGHOUT THE PERIOD OF CONSTRUCTION.

3. **INVASIVE SPECIES CONTROL:**
THE CONTRACTOR SHALL REMOVE ALL INVASIVE SPECIES FOUND IN THE LIMITS OF THE RESTORATION OR REPLICATION AREA AND SPOT TREAT STEMS AND ROOT SYSTEMS WITH AN APPROVED HERBICIDE. ONCE THE HERBICIDE HAS BEEN APPLIED TO THE CONTRACTOR SHALL REMOVE THE ROOTS AND STEMS BY EXCAVATION OR CHAINING.
THE DEPTH OF EXCAVATION MAY BE UP TO 2.5' BELOW GROUND.

4. **REMOVAL OF SOIL:**
THE SUBSOLS SHALL BE EXCAVATED WITHIN THE WETLAND RESTORATION AND REPLICATION AREAS TO A DEPTH OF 12" BELOW FINISHED GRADE. IF SUITABLE LAYERS OF SOIL, AS DETERMINED BY WETLANDS SPECIALIST, ARE ENCOUNTERED FOR REUSE AS TOPSOIL, STOCKPILE FOR REUSE. STOCKPILING OF SOILS SHALL NOT EXCEED ONE WEEK IN DURATION.

5. **PLACEMENT OF TOPSOIL AND FINAL GRADING:**
THE APPROVED WETLAND TOPSOIL SHALL BE PLACED ON THE WETLAND AREA TO A THICKNESS OF 12", BRINGING THE AREA TO FINISH GRADE. SOILS SHALL BE AN EQUAL MIX OF SANDY LOAM WITH 10% ORGANIC CONTENT. THE SOILS SHALL BE ROTO-TILLED PRIOR TO SEEDING AND STABILIZATION.

6. **WETLAND TOPSOIL CHARACTERISTICS:**
AT LEAST 12" OF NATURAL AND MANMADE TOPSOIL WITH A TEXTURE OF FINE SANDY LOAM OR FINER SHALL BE INSTALLED IN THE WETLAND MITIGATION AREA. MANMADE TOPSOIL SHALL CONSIST OF A MIXTURE OF EQUAL VOLUMES OF ORGANIC AND MINERAL MATERIALS. CLEAN LEAF COMPOST IS THE PREFERRED SOIL AMENDMENT TO ACHIEVE THESE STANDARDS. IF OTHER SOIL AMENDMENTS ARE MORE READILY AVAILABLE THAN CLEAN LEAF COMPOST THEY CAN BE USED TO MEET THE REQUIREMENTS OF ORGANIC CONTENT. SOILS SHALL BE TESTED PRIOR TO UTILIZATION AND AUGMENTED, IF NECESSARY, WITH COMPOSTED LEAF LITTER FROM AN APPROVED SOURCE TO RAISE THE ORGANIC CONTENT TO THE DESIRED PERCENT COMPOSITION BY VOLUME (50±%). THE SOIL LITTER MAY BE ROTO-TILLED INTO THE "A" HORIZON. IF NECESSARY, TOPSOIL MAY BE BROUGHT IN FOR ON-SITE USE FROM SOURCE APPROVED BY THE WETLAND SCIENTIST. THE SOILS WITHIN THE WETLAND REPLACEMENT AREA SHALL BE SLIGHTLY MOUNDED AND DEPRESSED TO CREATE MICRO-TOPOGRAPHY AND PROVIDE VEGETATIVE DIVERSITY. BASED UPON SOIL TEST PITS, THE SUBSOLS SHALL CONSIST OF IN-PLACE, NON-COMPACTED SANDS. ACTUAL SOILS STRATA MAY VARY FROM THE TEST PITS. REPAIR AND RESTORATION AND REPLICATION AREAS IMMEDIATELY FOLLOWING ROUGH GRADING, AND, IF NECESSARY IN SELECTED AREAS, THE SUBSOLS WILL BE OVER-EXCAVATED BY 12" FOR PLACEMENT OF APPROVED SOILS PRIOR TO PLACEMENT OF TOPSOIL.

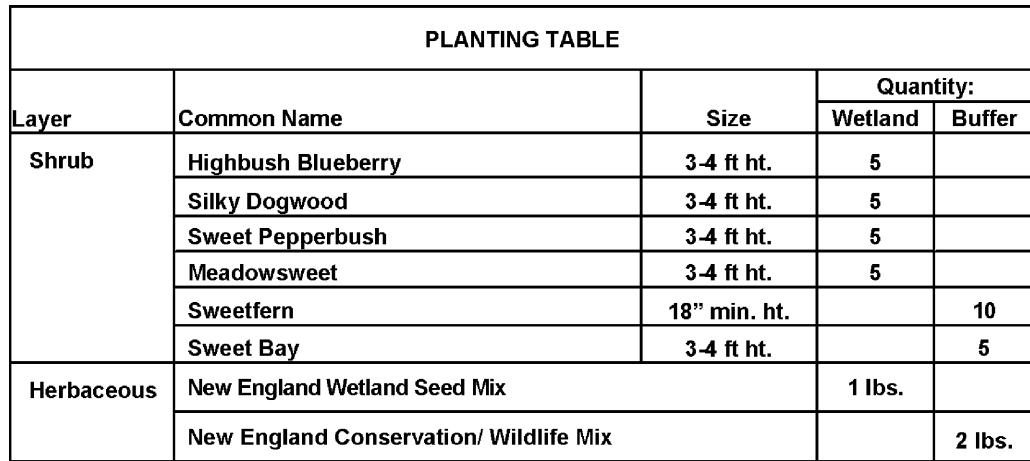


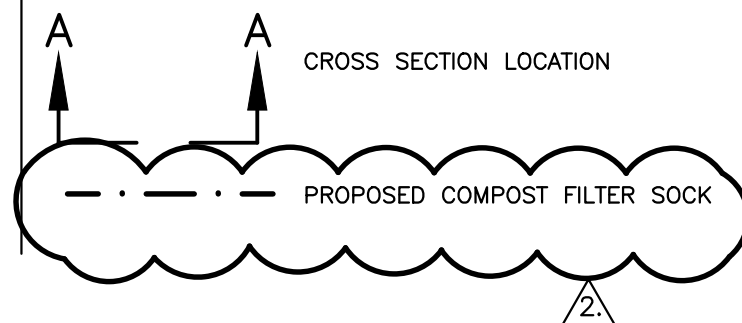
Diagram illustrating the specifications for a tree planting pit:

- SLOPE:** MI. 0.45M (1.5') FROM PLANT CENTER TO FINISHED GRADE.
- PRUNE TOP 1/3 GROWTH ON SHRUBS AFTER PLANTING, THIN BRANCHES BY 1/3 ON TREES AFTER PLANTING.**
- MULCH:** .075M (3") DEPTH WITH STRAW OR OTHER MULCH APPROVED BY WETLAND SCIENTIST.
- BACKFILL WITH WETLAND TOPSOIL.**
- CUT & REMOVE TOP 1/2 BURLAP.**
- WETLAND TOPSOILS & EXISTING SUBGRADE.**
- FINISHED GRADE.**
- 0.15M (6") MIN.**

MONITORING
WELL DATA
NTS

- WETLAND BOUNDARY NOTES:

1. THIS DRAWING REFLECTS MODIFICATIONS TO THE BOUNDARY OF EXISTING WETLANDS, AS DETERMINED DURING THE SEPTEMBER 18, 2020, FIELD WALK WITH BILL GRAFTON. CERTAIN WETLAND FLAG LOCATIONS WERE ADJUSTED DURING THE FIELD WALK. ACCORDANCE WITH CHAPTER 505-16 OF THE MARSHFIELD WETLANDS PROTECTION REGULATIONS, WETLAND FLAGS INCLUDING THE SUFFIX "-R" WERE ADDED OR ADJUSTED AT THE FIELD WALK AND WERE LOCATED BY SUPPLEMENTAL GPS SURVEY METHODS.
2. THE WETLAND REPLICATION AREA HAS BEEN REVISED TO REFLECT THE MODIFIED WETLAND BOUNDARY. THE REVISED REPLICATION AREA INCLUDES 870 SQUARE FEET OF NEW WETLAND CREATION.



The Airport Owner retains ownership of this drawing. The Owner may not use this drawing for other than the purpose intended. ASG, LLC shall not be responsible for any claims or damages, which may occur by virtue of the use of this drawing for any purpose other than that for which it was intended or by the modification of this drawing in any way from its original form.

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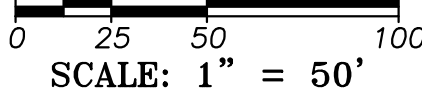
AIRPORT CONSULTANT • BURLINGTON, MASSACHUSETTS
PHONE (781) 491-0083 FAX (781) 491-0360

GEORGE D. HARLOW FIELD
MARSHFIELD AIRPORT COMMISSION
MARSHFIELD, MASSACHUSETTS

2.	2/23/21	REVISED PER ASG COMMENTS	EDM
1.	9/28/20	WETLANDS	TEJ
NO.	DATE	DESCRIPTION	BY

PROJECT NO.	776210
CADD FILE	CADD FILE
DESIGNED BY	ERG
DRAWN BY	EDM
CHECKED BY	ERG/SDR
DATE	AUGUST, 2020
DRAWING SCALE	1"=50'

GRAPHIC SCALE



SHEET TITLE

REPLICATION PLANTING & GRADING PLAN

FIGURE

NOI.8



Appendix C

Agency Correspondences and Public Meetings

MARSHFIELD CONSERVATION COMMISSION MEETING
Marshfield Town Hall 870 Moraine Street Marshfield, MA 02050
October 6, 2020 @ 6:30PM
NOTICE OF REMOTE PARTICIPATION MEETING

AGENDA FOR REMOTE PARTICIPATION MEETING

In response to Governor Baker's declaration of a public health emergency and the related Emergency Executive Order dated March 12, 2020 as well as the Marshfield Board of Selectmen's Declaration of Emergency on March 17, 2020, the Conservation Commission shall be meeting remotely until further notice. The audioconferencing application Zoom will be used for this purpose. An online link and telephone access number will be provided on all meeting agendas and also on the Board's website. This application will permit the public to access and participate in future Board meetings and hearings. Instructions for joining meetings in this manner will be provided on the Commission and Town Clerk's websites. In addition, Marshfield Community TV may provide coverage of these meetings. We extend our thanks for your understanding and participation in this manner, which is intended to keep members of the Board and the public safe.

Join Zoom Meeting: <https://us02web.zoom.us/j/84557984794?pwd=a1VxUDhxUGJCOVZXS1pNekw5elExZz09>

Meeting ID: 845 5798 4794

Passcode: 312519

One tap mobile

+16465588656,, 84557984794# US (New York)

+13017158592,, 84557984794# US (Germantown)

1. Call to Order, Instructions by Chair *
2. Chairman's Address
3. Minutes TBD
4. Open Session:
 Business
 - a) B1 Conservation Commission Reorganization / Commission
 - b) B2 Eagle Scout Project/Troop 101-reclaiming existing path in buffer zone, DeMinimis activity or RDA – Lucas Will
 - c) B3 965 Plain Street – Proposed conceptual layout for new Public Works Facility
 - d) B4 35 Parsonage Street - Proposed Temporary structures for Public Works Operations
 - e) B5 0 Cove Street / Coastal Dune Restoration – Guidance on Modification- Rob Leveque / Commissioners
 - f) B6 1327 Union Street/SE42-2727 Digan dock/Request For Certificate of Compliance issues – Jed Hannon
 - g) B7 890 Webster Street/Complaint: unpermitted removal and alteration – Jim Whooly
 - h) B8 111 Meadowview/revised restoration plan & RCOC withdrawal – Commissioners & John Zimmer
 - i) B9 28 Brighton Street E.O. or Conservation Permit – McAuffle – J. Michael Landscaping
5. Public Hearings (on or after 6:40PM)
 - a) 2881 Driscoll 172 Ridge Road (Septic Repair).....NEW (Rick)
 - b) 28 Moylan, 173 South River Street (Driveway Construction).....NEW (Joe)
 - c) 2882 Cheney, 856 South River Street (Attached Garage).....NEW (Rick)
 - d) 2880 Sullivan, 14 Shady Lane (Septic Repair).....cont from 9/15/2020 (Bert)
 - e) 2879 Town of Marshfield / Airport, 93 Old Colony Lane (Fence).....cont from 9/15/2020 (Art)
 - f) 2877 Dodge, 1112 Ferry Street (Raze & Rebuild).....cont from 9/1/20 (Rick)
 - g) 2860 Murphy, 1213 Ferry Street (Extend Pier, Ramp & Float).....cont from 3/17/20 (Jim)

6. REQUESTS FOR CERTIFICATES OF COMPLIANCE & EXTENSIONS

- a) 2217-Amended Paris Realty Trust, Main Street / John Sherman Estates [EXT]
- b) 2281 Grey, 249 Bay Ave [EXT]
- c) 2407 Follett, 111 Meadowview Street [COC] –WITHDRAWAL
- d) 2647 Leoine (Now McDonough), 242 Ridge Road [COC]
- e) 2651 O'Reilly, 296 Spring Street [COC]
- f) 2707 Pomerantz, 56 Bartlett's Island Way [COC]
- g) 2727 Digan, 1327 Union Street [COC] –DENIAL
- h) 2780 Kelly, 509 Highland Street [COC]

7. ENFORCEMENT ORDERS Smith, 38 Liberty Street (11/19/18 KS will set early Dec visit); Drosopoulos, 7 Lady Slipper Lane (08/15/18 TC Final Notice); Mahaney, 46 Preston Terrace (12/12/18 BG met with TC); White, 180 Atwell Circle (Escalation letter in Process); Bednarz/ Nouza, 65 Ireland Road (Unpermitted Cutting <= 50 ft): Tamara Macuch, 237 Webster Avenue; Stifter, 102 Bartlett's Island (unpermitted revetment wall)

8. Adjourn.

NOTES TO REMOTE MEETINGS

1. All or any of the members of the public body may choose to participate in a public meeting via remote access. Meetings may be virtual, in their entirety.
 2. The public will not be allowed into a Board/Committee meeting, even where there are any members of the public body and/or town staff or official(s) physically present at the meeting location during the meeting. "Public comment" portions of meetings will be temporarily suspended.
 3. However, the public will be provided with alternative access through which they can watch or listen to meetings "in real time," and meeting notices will specify the manner in which members of the public may access audio or video of the meeting as it is occurring.
 4. If, despite our best efforts, our technological capabilities do not adequately support public access to virtual or remote meetings, the town will ensure that an audio or video recording, transcript, or other comprehensive record of the proceedings at the meeting is posted on the town's website as soon as possible after the meeting.
 5. Notices for public hearings will contain additional information about how the public may participate via electronic/technological means.
 6. For executive session meetings, public access to the meeting will be limited to the open session portion(s) of the meeting only. Public access to any audio, video, internet or web-based broadcast of the meeting will be discontinued when the public body enters executive session.
 7. Where individuals have a right, or are required, to attend a public meeting or hearing, including executive session meetings, they will be provided with information about how to participate in the meeting/hearing remotely.
 8. Meeting notices will still be posted at least 48 hours in advance (not counting Saturdays, Sundays, or legal holidays), unless it is an emergency meeting as defined under the Open Meeting Law (in which event, the meeting notice will be posted with as much advanced notice as is possible in the circumstances). Minutes will still be taken.
-



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ENVIRONMENTAL

ECOLOGICAL

WATER

CONSTRUCTION
MANAGEMENT

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Suite 1400
Springfield, MA 01103
T: 413.726.2100
F: 413.732.1249
www.gza.com



2/02/2021

File No. 15.0166669.01

Submitted Via Email to robert.boeri@mass.gov

Massachusetts Office of Coastal Zone Management
251 Causeway St., Suite 800
Boston, MA 02114

Re: Marshfield Municipal Airport
George Harlow Field
Coastal Zone Consistency Statement
Extension of Existing Airport Wildlife Management / Perimeter Fence

Dear Review:

The Marshfield Municipal Airport-George Harlow Field (Airport) and the Federal Aviation Administration (FAA) are proposing to extend to an Existing Airport Wildlife Management / Perimeter Fence to fully enclose the Airport to prevent hazard-posing wildlife from entering areas of the Airport where aircraft and animal collisions may occur. Chain-link fencing is currently established along the northwestern and southeastern extents of the runway. It extends outside the runway safety area along most of its length. There is currently no fencing present at either end of the runway to the northeast (RW 24) and to the southwest (RW 6) which also includes vegetated wetland areas. The proposed fence would occur entirely on Airport property except in two locations: the southwest corner which is land owned by the Town of Marshfield Conservation Commisison; and the northeast corner which is owned by Massachusetts Audubon (see Plan Sheet NOI.2 in Attachment B). The Airport and the Marshfield Conservation Commission (Commission) have entered into a Memorandum of Understanding (MOU) to allow for fence installation and maintenance on the Town property, the Airport and the Massachusetts Audubon Society have agreed to allow for fencing within the existing avigation easement.

The Airport and FAA have prepared an Environmental Assessment, which is still under review, for the Proposed Action. The Site is located within the Coastal Zone Management Area for the South Shore of Massachusetts. The Proposed Action is consistent with the federal Coastal Zone Management Act of 1972 (Pub.L. 92-583, 86 Stat. 1280, enacted October 27, 1972, 16 U.S.C. §§ 1451-1464, Chapter 33) and as outlined in the Massachusetts Office of Coastal Zone Management Policy Guide - October 2011 and as outlined below.

Coastal Hazards

- Coastal Hazards Policy # 1
 - *Summary Statement: Preserve, protect, restore, and enhance the beneficial functions of storm damage prevention and flood control provided by natural coastal landforms, such as dunes, beaches, barrier beaches, coastal banks, land subject to coastal storm flowage, salt marshes, and land under the ocean.*
 - **Response: The Proposed Action will be constructed within Federal Emergency Management Agency (FEMA) Hazards Area and Massachusetts Wetland Protection Act**



(WPA) defined Land Subject to Coastal Storm Flowage. Work will occur within this zone, although will not result in alteration to local topography; therefore, there will be no change in the volumetric capacity of the land.

- Coastal Hazards Policy # 2
 - *Summary Statement: Ensure that construction in water bodies and contiguous land areas will minimize interference with water circulation and sediment transport. Flood or erosion control projects must demonstrate no significant adverse effects on the project site or adjacent or downcoast areas.*
 - **Response: The Proposed Action will not interfere with water circulation and/or sediment transport as the structure of the fencing will not inhibit the movement of water within the floodplain.**
- Coastal Hazards Policy # 3
 - *Summary Statement: Ensure that state and federally funded public works projects proposed for location within the coastal zone will:*
 - *Not exacerbate existing hazards or damage natural buffers or other natural resources.*
 - *Be reasonably safe from flood and erosion-related damage.*
 - *Not promote growth and development in hazard-prone or buffer areas, especially in velocity zones and Areas of Critical Environmental Concern.*
 - *Not be used on Coastal Barrier Resource Units for new or substantial reconstruction of structures in a manner inconsistent with the Coastal Barrier Resource/Improvement Acts.*
 - **Response: The Proposed Action will not damage nor alter local natural buffers or other natural resources within the coastal zone. The fence poles will be driven into the ground 10-feet deep and therefore will be safe from flood damage. The project will not promote growth and development, but rather is located within areas which contain legal conservation restrictions which prohibit development. There are no Coastal Barrier Resource Units within or near the project area.**
- Coastal Hazards Policy # 4
 - *Summary Statement: Prioritize acquisition of hazardous coastal areas that have high conservation and/or recreation values and relocation of structures out of coastal high-hazard areas, giving due consideration to the effects of coastal hazards at the location to the use and manageability of the area.*
 - **Response: The area already serves to diminish storm wave action and to store floodwaters.**

Energy

- Energy Policy # 1
 - *Summary Statement: For coastally dependent energy facilities, assess siting in alternative coastal locations. For non-coastally dependent energy facilities, assess siting in areas outside of the coastal zone. Weigh the environmental and safety impacts of locating proposed energy facilities at alternative sites.*
 - **Response: Not Applicable.**
- Energy Policy # 2
 - *Summary Statement: Encourage energy conservation and the use of renewable sources such as solar and wind power in order to assist in meeting the energy needs of the Commonwealth.*
 - **Response: Not Applicable.**

Growth Policy

- Growth Management Policy #1
 - *Summary Statement: Encourage sustainable development that is consistent with state, regional, and local plans and supports the quality and character of the community.*



- **Response: Not Applicable.**
- Growth Management Policy #2
 - *Summary Statement: Ensure that state and federally funded infrastructure projects in the coastal zone primarily serve existing developed areas, assigning highest priority to projects that meet the needs of urban and community development centers.*
 - **Response: Not Applicable.**
- Growth Management Policy #3
 - *Summary Statement: Encourage the revitalization and enhancement of existing development centers in the coastal zone through technical assistance and financial support for residential, commercial, and industrial development.*
 - **Response: Not Applicable.**

Habitat

- Habitat Policy #1
 - *Summary Statement: Protect coastal, estuarine, and marine habitats—including salt marshes, shellfish beds, submerged aquatic vegetation, dunes, beaches, barrier beaches, banks, salt ponds, eelgrass beds, tidal flats, rocky shores, bays, sounds, and other ocean habitats—and coastal freshwater streams, ponds, and wetlands to preserve critical wildlife habitat and other important functions and services including nutrient and sediment attenuation, wave and storm damage protection, and landform movement and processes.*
 - **Response: There will be no alteration to the habitat around the areas of work of the Proposed Action, except that the project will result in the exclusion of large animals from the Airport runway, taxiways and other paved surfaces. The habitat as it exists today will remain as WPA Resources Areas and Endangered Species Habitat.**
- Habitat Policy #2 [enforceable]
 - *Summary Statement: Advance the restoration of degraded or former habitats in coastal and marine areas.*
 - **Response: There will not be alteration to the coastal habitat at the Site as it has not been degraded.**

Ocean Resources

- Ocean Resources Policy #1
 - *Summary Statement: Support the development of sustainable aquaculture, both for commercial and enhancement (public shellfish stocking) purposes. Ensure that the review process regulating aquaculture facility sites (and access routes to those areas) protects significant ecological resources (salt marshes, dunes, beaches, barrier beaches, and salt ponds) and minimizes adverse effects on the coastal and marine environment and other water-dependent uses.*
 - **Response: Not Applicable.**
- Ocean Resources Policy #2
 - *Summary Statement: Except where such activity is prohibited by the Ocean Sanctuaries Act, the Massachusetts Ocean Management Plan, or other applicable provision of law, the extraction of oil, natural gas, or marine minerals (other than sand and gravel) in or affecting the coastal zone must protect marine resources, marine water quality, fisheries, and navigational, recreational and other uses.*
 - **Response: Not Applicable.**
- Ocean Resources Policy #3



- *Summary Statement: Accommodate offshore sand and gravel extraction needs in areas and in ways that will not adversely affect marine resources, navigation, or shoreline areas due to alteration of wave direction and dynamics. Extraction of sand and gravel, when and where permitted, will be primarily for the purpose of beach nourishment or shoreline stabilization.*
- **Response: Not Applicable.**

Ports and Harbors

- Ports and Harbors Policy #1
 - *Summary Statement: Ensure that dredging and disposal of dredged material minimize adverse effects on water quality, physical processes, marine productivity, and public health and take full advantage of opportunities for beneficial re-use.*
 - **Response: Not Applicable.**
- Ports and Harbors Policy #2 [enforceable]
 - *Summary Statement: Obtain the widest possible public benefit from channel dredging and ensure that Designated Port Areas and developed harbors are given highest priority in the allocation of resources.*
 - **Response: Not Applicable.**
- Ports and Harbors Policy #3
 - *Summary Statement: Preserve and enhance the capacity of Designated Port Areas to accommodate water-dependent industrial uses and prevent the exclusion of such uses from tidelands and any other DPA lands over which an EEA agency exerts control by virtue of ownership or other legal authority.*
 - **Response: Not Applicable.**
- Ports and Harbors Policy #4
 - *Summary Statement: For development on tidelands and other coastal waterways, preserve and enhance the immediate waterfront for vessel-related activities that require sufficient space and suitable facilities along the water's edge for operational purposes.*
 - **Response: Not Applicable.**
- Ports and Harbors Policy #5
 - *Summary Statement: Encourage, through technical and financial assistance, expansion of water-dependent uses in Designated Port Areas and developed harbors, re-development of urban waterfronts, and expansion of physical and visual access.*
 - **Response: Not Applicable.**

Protected Areas

- Protected Areas Policy #1
 - *Summary Statement: Preserve, restore, and enhance coastal Areas of Critical Environmental Concern, which are complexes of natural and cultural resources of regional or statewide significance.*
 - **Response: Not Applicable, no ACEC's are present at the Site.**
- Protected Areas Policy #2
 - *Summary Statement: Protect state designated scenic rivers in the coastal zone.*
 - **Response: Not Applicable, no scenic rivers are present at the Site.**
- Protected Areas Policy #3
 - *Summary Statement: Ensure that proposed developments in or near designated or registered historic places respect the preservation intent of the designation and that potential adverse effects are minimized.*



- **Response:** Historic resources are present at the Site; therefore, coordination with the Massachusetts Historic Commission has been conducted. No historic areas will be impacted by the Proposed Action.
- Quoting from PAL's report (Management Abstract), please see Attachment C.

"An intensive archaeological survey and supplemental site examination were completed for the Marshfield Municipal Airport-George Harlow Field Right-Of-Way (ROW) Easement Acquisition and Perimeter Fence Project (the Project) in Marshfield, Massachusetts. Previous archaeological investigations conducted for infrastructure improvements at Marshfield Municipal Airport-George Harlow Field indicated that the Area of Potential Effect (APE) for the current Project includes sections of the extensive Marshfield Airport Site (19-PL-426). This site contains 10 loci of pre-contact Native American settlement and evidence of occupation spanning 9,000 years from the late PaleoIndian Period to the Late Woodland Period.

However, the portions of Loci 1 and 9 within the APE for the current Project have low information content and do not retain enough integrity to be considered potentially significant archaeological resources. Further study of Loci 1 and 9 of the Marshfield Airport Site and of the Waterman House Site for the Marshfield Municipal Airport-George Harlow Field ROW Easement Acquisition and Perimeter Fence Project, as currently planned, is unlikely to yield new information, and no additional archaeological investigation is recommended."

Public Access

- Public Access Policy #1
 - *Summary Statement: Ensure that development (both water-dependent or nonwater-dependent) of coastal sites subject to state waterways regulation will promote general public use and enjoyment of the water's edge, to an extent commensurate with the Commonwealth's interests in flowed and filled tidelands under the Public Trust Doctrine.*
 - **Response: Not Applicable.**
- Public Access Policy #2
 - *Summary Statement: Improve public access to existing coastal recreation facilities and alleviate auto traffic and parking problems through improvements in public transportation and trail links (land- or water-based) to other nearby facilities. Increase capacity of existing recreation areas by facilitating multiple use and by improving management, maintenance, and public support facilities. Ensure that the adverse impacts of developments proposed near existing public access and recreation sites are minimized.*
 - **Response: Not Applicable.**
- Public Access Policy #3
 - *Summary Statement: Expand existing recreation facilities and acquire and develop new public areas for coastal recreational activities, giving highest priority to regions of high need or limited site availability. Provide technical assistance to developers of both public and private recreation facilities and sites that increase public access to the shoreline to ensure that both transportation access and the recreation facilities are compatible with social and environmental characteristics of surrounding communities.*
 - **Response: Not Applicable.**

Water Quality

- Water Quality Policy #1
 - *Summary Statement: Ensure that point-source discharges and withdrawals in or affecting the coastal zone do not compromise water quality standards and protect designated uses and other interests.*



- **Response: The Proposed Action has followed all procedures laid out in the WPA (Massachusetts General Laws (MGL) Chapter 131, Section 40) and it's implementing regulations in 310 Code of Massachusetts Regulations (CMR) 10.00 to ensure water quality is not impacted in any capacity by the Proposed Action. The Project received an Order of Conditions from the Marshfield Conservation Commission in October 2020.**
- Water Quality Policy #2
 - *Summary Statement: Ensure the implementation of nonpoint source pollution controls to promote the attainment of water quality standards and protect designated uses and other interests.*
 - **Response: There are no new point source discharges associated with the Proposed Action.**
- Water Quality Policy #3
 - *Summary Statement: Ensure that subsurface waste discharges conform to applicable standards, including the siting, construction, and maintenance requirements for on-site wastewater disposal systems, water quality standards, established Total Maximum Daily Load limits, and prohibitions on facilities in high-hazard areas.*
 - **Response: Not Applicable.**

If you should have any questions prior to the public hearing, please contact Stephen Lecco at (413) 726-2114 or via email at Stephen.Lecco@gza.com.

Very truly yours,

GZA GeoEnvironmental, Inc.

Seth Taylor, CEP, CESSWI, CIPM^{RI, MA}
Environmental Planner / Ecologist



Steven D. Riberdy MS, CWB®, PWS, CERP, CE
Senior Ecologist / Senior Technical Specialist

Stephen Lecco, A.I.C.P., C.E.P.
Associate Principal / Senior Planner

Attachments: Locus Map and FEMA Map (A), Proposed Action Project Plans (B), and Public Archaeology Laboratory's Technical Report: *Intensive Archaeological Survey And Supplemental Site Examination Marshfield Municipal Airport-George Harlow Field Right-Of-Way Easement Acquisition And Perimeter Fence Project* (C).

**No Reply from CZM was Received as of
3/12/2021**



RECEIVED
3-20-2020

March 17, 2020

The Commonwealth of Massachusetts
William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

Christopher J. Willenborg
Airport Solution Group
39 Winn Street
Burlington, MA 01803

RE: George D. Harlow Field Airport, Easement Acquisition and Perimeter Fence Project,
93 Old Colony Lane, Marshfield, MA. MHC #RC.8315.

Dear Mr. Willenborg:

Staff of the Massachusetts Historical Commission (MHC) have reviewed the archaeological report, *Intensive (Locational) Archaeological Survey and Supplemental Site Examination Marshfield Municipal Airport-George Harlow Field Right of Way Easement Acquisition and Perimeter Fence Project, Marshfield, Massachusetts*, prepared and submitted by the PAL, Inc., received March 2, 2020, for the project referenced above.

Archaeological testing within project impact areas did not identify intact, significant portions of the Marshfield Airport Site (19-PL-426) and Waterman historic archaeological site (MRS.HA.11). The Woodbine Road cul-de-sac reconstruction portion of the overall project impact area has been subjected to previous disturbance associated with previous grading and earth movement. No intact, significant archaeological resources associated with the Marshfield Airport Site ancient Native American occupations were identified within perimeter fencing portions of the overall project impact areas. The MHC recommends no further archaeological survey for the project as proposed. In the MHC's staff opinion, the right of way easement acquisition and perimeter fence project as proposed is unlikely to affect significant historic or archaeological resources.

If project plans change in future, then updated project information should be submitted to the MHC for review and comment. The MHC looks forward to receiving project information for future airport projects that may include ground impacts, and to consultation to assist to avoid, minimize or mitigate adverse effects to significant historic and archaeological resources.

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800) and/or M.G.L Chapter 9, sections 26-27C (950 CMR 70-71). If you have any questions, please contact Jonathan. K Patton at this office.

Sincerely,

Brana Simon
Executive Director
State Historic Preservation Officer
State Archaeologist
Massachusetts Historical Commission

xc: David Dineen, Marshfield Municipal Airport
Richard Doucette, FAA
Katie Servis, MADOT-Aeronautics
Deborah C. Cox, PAL, Attn: Duncan Ritchie



Appendix D

Wildlife Hazard Assessment

Marshfield Municipal Airport George Harlow Field



Submitted by:
Epsilon Associates, Inc.
3 Mill & Main Place, Suite 250
Maynard, MA 01754

March 2020

Epsilon
ASSOCIATES, INC.

ASG

AIRPORT SOLUTIONS GROUP
Innovative Airport Development Specialists

Wildlife Hazard Management Plan

Marshfield Municipal Airport

George Harlow Field

Marshfield, Massachusetts

Prepared by:

Epsilon Associates, Inc.

3 Mill & Main Place, Suite 250
Maynard, Massachusetts 01754

March 11, 2020



Cover Photo Credits:
MassDOT Aeronautics Division
Aircraft Owners and Pilots Association (AOPA)
Town of Marshfield

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Attachment C	Wildlife Control Suppliers
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Attachment E	Wildlife Strike Collection Kit Supplies
Attachment F	Airport Wildlife Biologist Qualifications

WILDLIFE HAZARD MANAGEMENT PLAN

Executive Summary

Marshfield Municipal Airport-George Harlow Field (GHG) developed this Wildlife Hazard Management Plan (WHMP) upon completion of a 12-month wildlife hazard assessment (WHA) that took place over the course of 2017 and 2018. The FAA approved the WHA in 2019. This WHMP is an elective document that provides a formal plan that will be utilized by GHG personnel. This plan will be reviewed by GHG periodically and updated if circumstances merit.

A wildlife hazard is defined as the potential for a damaging collision between wildlife and aircraft near an airport. This WHMP emphasizes identification and abatement of wildlife hazards within GHG. While two wildlife strikes involving minor aircraft damage have been reported at GHG, no wildlife strikes involved injury or loss of life. This WHMP emphasizes identification and abatement of wildlife hazards at GHG. Based on data collected during the WHA, records from the Federal Aviation Administration (FAA) Wildlife Strike Database, and records of control efforts by GHG personnel, avian groups most concerning to aircraft safety include waterfowl, raptors, starlings and blackbirds. White-tailed deer (*Odocoileus virginianus*) and eastern coyote (*Canis latrans*) are mammals most concerning to aircraft safety.

GHG has long maintained wildlife hazard management techniques. This plan formalizes the measures GHG takes to identify and mitigate hazards whenever they are detected or whenever Airport management has been advised that hazardous conditions exist. The plan outlines steps for monitoring, documenting and reporting potential wildlife hazards and strikes. Protocols for responding to hazardous wildlife situations are presented below, including the roles and responsibilities of GHG personnel. Wildlife control procedures are also discussed. To the extent practicable, habitat on and around the airfield will be managed in a manner that is not conducive to hazardous wildlife.

Most wildlife species are afforded some type of protection under local, state or federal regulations; therefore, special permits may be required for their control. This plan focuses on those laws and regulations governing legal harassment and “take” of various types of wildlife. GHG’s permit status for each type of wildlife is outlined within this WHMP. Copies of the current federal and state depredation permits are included as an attachment.

GHG maintains an adequate supply of resources for dispersing and controlling wildlife. GHG personnel are trained to properly identify wildlife and apply wildlife deterrent equipment in a safe and effective manner, as outlined in this WHMP.

1.0 Introduction

This WHMP has been prepared to formalize the Airport's practice of minimizing wildlife hazards to aviation safety and human health. The Marshfield Airport Commission and GHG elected to create and implement this WHMP to minimize the potential for wildlife hazards. While GHG is a general aviation (GA) airport, and not a Part 139 certified airport, the Airport, cooperatively with the FAA, has decided to address the wildlife hazard issues at GHG using the same Part 139 compliant model outlined within the FAA regulation and advisory circulars. This WHMP builds upon the findings and recommendations outlined in the WHA, formally accepted by the FAA on October 28, 2019 and includes Airport-specific wildlife hazard mitigation program. Federal Aviation Regulation (FAR) Part 139.337: Wildlife Hazard Management and the Advisory Circular 150/5200-38 *Protocol for the Conduct and Review of Wildlife Hazard Site Visits, Wildlife Hazard Assessments and Wildlife Hazard Management Plans* were generally utilized to create this WHMP. The WHMP defines habitat management objectives and wildlife control procedures to reduce the potential for damaging strikes. The seven components outlined in FAR 139.337(f): Wildlife Hazard Management are provided below:

1. A list of the individuals having authority and responsibility for implementing each aspect of the plan. **(Section 2)**
2. A list prioritizing the following actions identified in the WHA and target dates for their initiation and completion:
 - a. Wildlife population and management;
 - b. Habitat modification; and
 - c. Land use changes. **(Section 3)**
3. Requirements for and, where applicable, copies of local, State, and Federal wildlife control permits. **(Section 4)**
4. Identification of resources that the certificate holder will provide to implement the plan. **(Section 5)**
5. Procedures to be followed during aircraft operations¹ that at a minimum includes:
 - a. Designation of personnel responsible for implementing the procedures;

¹ GHG is a GA airport that does not conduct Part 139 air carrier operations. While GHG, cooperatively with the FAA, determined to follow current guidelines for establishing a WHMP utilizing the Part 139 compliant model, note that air carrier operations are not conducted at the Airport.

- b. Provisions to conduct physical inspections of the aircraft movement areas and other areas critical to successfully manage known wildlife hazards before aircraft operations¹ begin;
 - c. Wildlife hazard control measures; and
 - d. Ways to communicate effectively between personnel conducting wildlife control or observing wildlife hazards [....]. **(Section 6)**
- 6. Procedures to review and evaluate the WHMP every 12 consecutive months or following an event described in FAR Part 139.337(b) including:
 - a. The plan's effectiveness in dealing with known wildlife hazards on and in the airport's vicinity and
 - b. Aspects of the wildlife hazards described in the wildlife hazard assessment that should be reevaluated. **(Section 7)**
- 7. A training program conducted by a qualified wildlife damage management biologist to provide airport personnel with the knowledge and skills needed to successfully carry out the wildlife hazard management plan required by (d) of FAR Part 139.337. **(Section 7)**

GHG strives to maintain the highest level of aviation and public safety possible through responsible land-use management and effective wildlife damage control techniques. Therefore, GHG has adopted applicable portions of this standard outlined above. Procedures outlined in this document set guidelines for appropriate and most effective use of control methods. However, they do not preclude GHG the use of other or experimental procedures or techniques that could accomplish wildlife hazard abatement. GHG is allowed the flexibility and ingenuity to implement other methods to alleviate hazards. Because airport environments and wildlife populations are dynamic, the WHMP shall be reviewed periodically to ensure that wildlife hazards are appropriately assessed and managed.

2.0 Implementation

GHG is owned by the Town of Marshfield and operated by the Marshfield Airport Commission. Personnel described below are responsible for carrying out specific functions described in this WHMP.

The Airport Manager has the overall authority and responsibility for day-to-day operation of the Airport, including primary responsibility for the implementation of the WHMP. A current copy of this plan is maintained in the Airport Manager's office and provided to staff. Clear communication and direction among Airport personnel are essential elements of a successful WHMP. Personnel will communicate resource needs, recommendations and progress to the Airport Manager.

GHG personnel are responsible for hazing and habitat control. GHG utilizes volunteer hunters, specifically identified on their depredation permits to conduct various direct control services on an on-call basis.

The Airport Manager shall:

- ◆ Supervise, coordinate and monitor wildlife control activities as outlined in the WHMP; disseminate information and assignments to staff.
- ◆ Ensure that the WHMP is approved by the FAA and those revisions and amendments comply with federal, state, and local laws and regulations.
- ◆ Obtain/maintain a migratory bird depredation permit from the U.S. Fish and Wildlife Service (USFWS): see [link](#) to download form.
- ◆ Maintain cooperative relationships with appropriate wildlife management agencies. Submit control activity logs to federal and state regulatory agencies in compliance with depredation permit conditions. USFWS will mail out annual reporting form to be submitted. Renew state depredation permit annually.
- ◆ Provide public relations support for wildlife control activities, as necessary.
- ◆ Alleviate attractants deemed an imminent hazard and, if necessary, coordinate runway closure(s) to remedy wildlife hazards.
- ◆ Inform pilots of imminent wildlife hazards. Coordinate the issuance of Notices to Airmen (NOTAM) for prolonged wildlife hazards. Advise pilots on UNICOM.
- ◆ Monitor facilities and interview tenants for wildlife problems.
- ◆ Ensure that personnel responsible for wildlife control are trained in the safe hazing techniques including the safe use of pyrotechnics through annual training offered by the U.S. Department of Agriculture (USDA).
- ◆ Ensure that all wildlife control efforts are documented. Including encouraging personnel and pilots report all types of wildlife strikes to the FAA Strike Database.
- ◆ Coordinate with volunteer hunting staff to lethally remove hazardous wildlife if no other hazing or harassment techniques result in hazard abatement in a timely fashion.
- ◆ Assist with or identify resources to implement habitat modification measures identified in WHMP (e.g. vegetation maintenance, brush/tree removal and pruning).
- ◆ Make the strike report form ([FAA Form 5200-7](#)) readily available. Encourage use of [Smithsonian Feather Identification Lab](#).

- ◆ Review future projects with a Qualified Airport Wildlife Biologist or USDA/Wildlife Services (USDA WS) Biologist to ensure hazards are managed and reviewed for any future work.

Designated GHG Staff shall:

- ◆ Assist the Airport Manager with implementing the WHMP and report wildlife issues.
- ◆ Alleviate attractants deemed an imminent hazard and, if necessary, coordinate runway closures to remedy wildlife hazards.
- ◆ Conduct and record daily wildlife control activities and attractants on GHG. Document all wildlife control efforts in the “Wildlife Log” or database. Note that wildlife-related information recorded on the daily inspection report can be transferred to the wildlife log (provided in Attachment D) .
- ◆ Inspect critical areas for wildlife activity and strikes and maintain a record of the action, even if no wildlife was present.
- ◆ Inform the Airport Manager and pilots of imminent wildlife hazards and haze/harass to remove these imminent hazards.
- ◆ Maintain and inspect the fence to exclude large mammals.
- ◆ Remove wildlife carcasses immediately upon discovery.
- ◆ Ensure that garbage cans and dumpsters are covered on Airport grounds.
- ◆ Modify and maintain habitat identified in WHMP (e.g. vegetation maintenance, brush/tree removal and pruning).
- ◆ Respond to bird/aircraft strikes, gather information for Bird/Other Wildlife Strike Reports (FAA Form 5200-7) and, if applicable, collect samples for identification (see Attachment E for Bird Strike Collection Kits or obtain free kits [here](#)).
- ◆ Monitor facilities and interview tenants for wildlife problems.

Airport Tenants shall:

- ◆ Ensure employees are aware of the wildlife hazard program at GHG.
- ◆ Enforce Airport regulations regarding feeding of wildlife, maintaining trash receptacles and reporting wildlife hazards that are identified.
- ◆ Inform Airport Manager when wildlife strikes occur.

Identified Volunteer Hunters shall:

- ◆ Respond to Airport Manager’s requests for increased management or lethal removal of persistent hazardous wildlife on the airfield with appropriate operational management.
- ◆ Volunteer Hunters are listed on the depredation permits and should be updated annually.

3.0 Wildlife Hazard Assessment Recommendations and Actions

The FAA approved 2019 WHA identified wildlife hazard attractants, species and behavior patterns, and provided recommendations to address them. Since wildlife management techniques often target specific species it is important to accurately identify the problem wildlife. Species-specific control methods for select species are provided herein. For more information on all wildlife identified on the airfield, refer to Section 6 of the WHA.

3.1 *Habitat Modification*

It is GHG's policy to minimize, to the extent practical, the development of new wildlife habitat and to manage existing habitat to minimize attraction. The Airport is bound by the current Vegetation Management Plan (VMP) and the Natural Heritage and Endangered Species Conservation Management Plan (CMP) for the state-listed eastern box turtle (*Terrapene carolina carolina*) which dictate mowing, vegetation cutting and management schedules outside the critical safety areas and approach surfaces.

- ◆ The Airport will continue to maintain short grass around all signs, light structures and safety area in accordance with FAA requirements. Grassy areas should be maintained within accepted protocols to achieve grass heights that are not too short to promote wildlife foraging or too tall to provide protective cover to wildlife, to the extent feasible. Mowing protocol generally achieves the six- to 14-inch recommendation.

Task ongoing

- ◆ The Airport will monitor vegetation. Any areas where vegetation does not minimally cover the ground (at a rate of at least 80% coverage) supplemental seeding will occur utilizing wildlife deterrent seed mix or grass seed that contains entophytic fungi that reduce feeding of herbivorous vertebrates and invertebrates. In areas that require planting or reseeding grass due to construction or vegetation clearing, the Airport will require the contractor to utilize wildlife deterrent seed mix or grass seed that contains entophytic fungi that reduce feeding of herbivorous vertebrates and invertebrates. Agricultural or horticultural seed mixes will be avoided.

Task ongoing

- ◆ Areas of standing water on pavement or within the maintained area could attract wildlife. If these areas are observed they will be filled in or otherwise removed as long as they are not considered wetland resource areas or waters of the U.S. by the Massachusetts Department of Environmental Protection (MassDEP), the US Army Corps of Engineers or the Marshfield Conservation Commission.

Task ongoing

- ◆ Waste receptacles will be rendered inaccessible to wildlife. GHG personnel will continue to conduct trash and foreign object debris (FOD) sweeps on the airfield.

Task ongoing

- ◆ The public shall not be allowed to feed wildlife at the Airport. Should wildlife feeding be noted, GHG personnel will inform those individuals of the problems caused by feeding wildlife. Airport tenants are notified of the no feeding policy. If necessary, signs will be posted to educate the public.

Task ongoing

- ◆ The fence shall be monitored during routine aerial or pedestrian inspections. These inspections will review the fence for compromises which can include holes in the fence, large gaps by gates, and slides under the fence which could allow wildlife access to the airfield. Improve the fence, as feasible. Improvements include patching holes, filling slides (if possible, fabric shall be placed in the slide prior to filling), removal or herbicide use to control vegetation on and near the fence, reseating gates and adding barbed wire. Re-hang or adjust gates with vertical gaps larger than four inches.

Task ongoing

- ◆ Monitor hangars and buildings for increased bird activity. If nests, perching or other bird attractant is observed, harass and exclude birds.

Task ongoing

- ◆ Wildlife exhibiting mating and nesting behavior (e.g. paired species) will be dispersed. Nests will be removed as soon as observed.

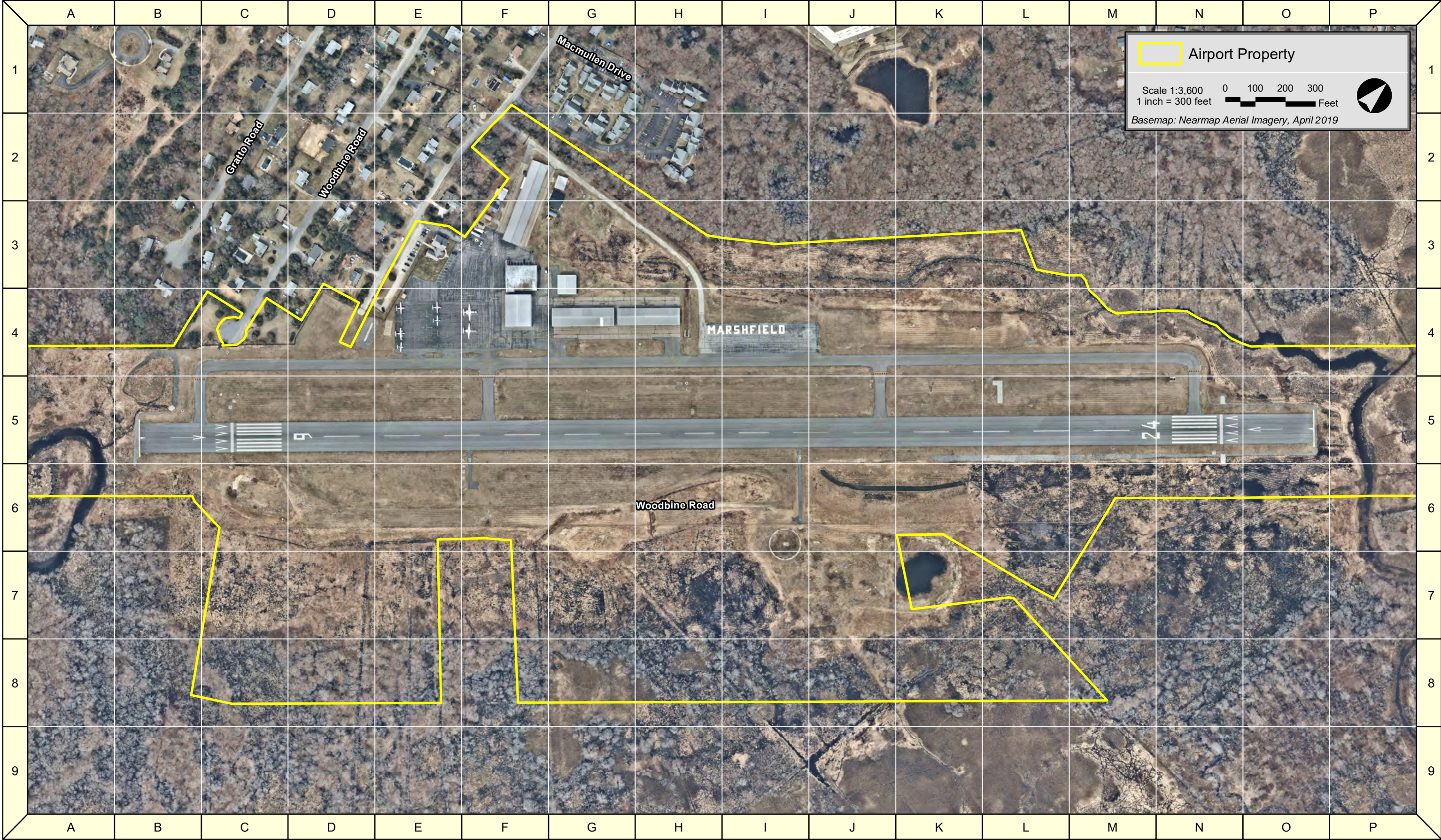
Task ongoing

- ◆ Monitor stormwater ditch and rivers along approaches for waterfowl and coyote activity. Increase hazing seasonally as necessary, especially at dawn and dusk.

Seasonal task ongoing

3.2 Wildlife Population Management

Recommendations include training Airport personnel to positively identify wildlife species of concern and implement measures to mitigate the identified concerns (e.g., hazing) and maintaining wildlife management documentation. USDA WS can provide wildlife hazard training upon request (413-253-2403) and may also provide identification resources. GHG personnel will use the attached Figure 1 to help identify areas where wildlife occurs at the Airport in order to



Marshfield Municipal Airport – George Harlow Field Marshfield, Massachusetts

pinpoint problem areas. Recommended avian identification books include *Peterson Field Guide to Birds of Eastern and Central North America* (Peterson, 2010), *The Sibley Field Guide to Birds of Eastern North America* (Sibley, 2000), and *National Geographic Field Guide to the Birds of North America* (Dunn and Alderfer, 2006).

- ◆ GHG will continue to maintain the Wildlife Activity and Control Log, an important component of managing hazardous wildlife. Daily wildlife control record keeping includes documentation of *all* efforts to detect and deter hazardous wildlife. All wildlife control, including carcass removal, should be recorded. The activity log should include the number of birds involved, cover type, and location on the airfield. Airfield patrols where no hazardous wildlife are detected should be noted by date and time. Detection of hazardous wildlife which does not result in immediate action should also be recorded. Wildlife control records should also document potential wildlife attractants.
- ◆ GHG personnel will identify hazards and aggressively harass and disperse hazardous birds and wildlife from the AOA whenever they are located on the airfield in a situation that could jeopardize aircraft safety. Wildlife near the runway or taxiway systems or potentially able to cross active areas will be dispersed using methods identified within Section 6 of this WHMP including but not limited to vehicle chasing, horns, pyrotechnics or lethal reinforcement using firearms. Personnel shall be trained in the safe handling and the most effective use of hazing devices to avoid increasing a potentially hazardous situation (e.g., chasing birds into the path of an approaching aircraft). NOTAMs are created to inform the flying public of severe wildlife conditions until they are abated.
- ◆ At least one wildlife patrol will be conducted per day by GHG management or staff. Date and time of all patrols will be documented on the daily log. The daily patrol route will allow for observations of all active movement areas during a single patrol, with special emphasis on any areas known to have higher levels of wildlife activity or limited visibility. If necessary, additional patrols will be scheduled during periods of high activity, most notably during spring and fall migrations, inclement weather or when increased wildlife activity is noted or observed. Additional patrols will be conducted when requested by external sources (pilots) or others.

3.3 *Specific Species Control*

Based on data collected during the WHA, records from the FAA Wildlife Strike Database, and control efforts by GHG personnel, the groups that are of most concern to aircraft safety include waterfowl, raptors, and starlings/blackbirds. Herons and egrets are also included as they are large-bodied birds. White-tailed deer and eastern coyote are the mammals of most concern to aircraft safety. It is strongly recommended that the Airport Manager's office maintains the recommended field guides (see page 6 of this document).

3.3.1 Blackbirds and Starlings

Blackbirds are seasonally present at GHG while European starlings inhabit the Airport year-round. These bird species are a concern due to their tendency to form large flocks in late summer through winter. Damage caused is generally related to flock size; several birds seldom cause damage while a large flock could cause significant damage.

Control Measures:

- ◆ Maintenance personnel will maintain long grass (six to 14 inches), where feasible. Long-grass management may deter blackbirds from feeding on the airfield. Preventing long grass that is tall enough to produce a seed head (thus a persistent food source and effective cover) is most important. Similarly, grass that is very short provides a safe insect foraging opportunity where birds can readily see potential threats. Blackbirds and starlings tend to flock in large groups in short cut grass. Managing grass height is especially important during the last mow of the season, in fall.
- ◆ There are currently areas of sparse grass cover; GHG should supplement the current grass cover by seeding where sparse grass coverage is observed. The current construction specification including low attractant grass seed shall be applied using hydroseeding application and fertilizer.
- ◆ Wetlands can be mowed or brush-hogged in compliance with the Airport's VMP to deter large numbers of breeding blackbirds.
- ◆ Concentrate hazing efforts in early morning and late afternoon hours when the birds are most active. Lethal control should be utilized when an immediate threat to aviation is present. Starlings can be removed at any time without state or federal permit. Blackbirds can be removed under federal depredation order.

3.3.2 Waterfowl (Ducks, Cormorants, Geese)

Waterfowl are one of the most significant wildlife concerns for any airport, due to their size, behavior and flocking tendencies. Waterfowl are attracted to wetlands and potentially to the stormwater ditch to feed, nest, loaf, and escape predators. Geese, mallards, and American black ducks were seen frequently in the Airport vicinity and flying over the airfield. Canada geese were seen loafing on the Airport around the runway and taxiways.

Control Measures:

- ◆ Long-grass management (six to 14 inches) may deter waterfowl from loafing or feeding on the airfield. Supplemental seeding as described above.

- ◆ Personnel should frequently patrol the stormwater ditch and the runway system and harass birds from these areas. Patrols could be increased during the months when waterfowl are present on the airfield in greatest numbers, generally winter to early spring. If necessary, control should be increased in early morning and evening hours to keep waterfowl from overnighing in the ditch network.
- ◆ Hazing with pyrotechnics works well for most waterfowl, however persistence is necessary. Waterfowl are also affected by the use of visual repellents (e.g. scarecrows, flags, coyote decoys) in conjunction with pyrotechnics. If waterfowl habituate to hazing efforts, it may become necessary to lethally remove select individuals to reinforce non-lethal methods. Lethal control of Canada geese and mallards are conducted under the terms and conditions listed in the USFWS and state depredation permits as a last resort after non-lethal means have proven ineffective. The [USFWS depredation permit](#) should be obtained and renewed annually in order to allow for lethal harassment measures.

3.3.3 Raptors

Raptors are present at GHG throughout the year. The most common species observed on the Airport is the red-tailed hawk, while the most common raptor species at areas surrounding the Airport is the osprey. Several other raptor species inhabit the Airport and its surrounding areas, including northern harriers. Northern harriers are a state species of special concern; harassment or other control action would require permission from Natural Heritage Endangered Species Program (NHESP).

Control Measures:

- ◆ Manage raptors through prey-base control (trapping and removal of small mammals and grass length management (to control small mammals, insects and birds).
- ◆ Airport staff should remove any animal carcasses, with gloved hands, on or near the Airport and keep all food waste in covered containers to prevent scavenging. Any carcasses must be buried or incinerated.
- ◆ Diversion techniques or equipment can be attached to primary perching structures where raptors are frequently observed, including the Automated Weather Observation Station (AWOS) or windsock, if it appears that raptors persist despite harassment.
- ◆ Raptors should be hazed with vehicles and pyrotechnics. Should none of the previously outlined control measures work, USDA WS can be contacted to help assist in removal and/or relocation. Appropriate permits shall be obtained prior to control.

3.3.4 Large-bodied birds (great egret and great blue heron)

Great egrets and great blue herons are large, slow-flying birds that frequent open, grassy areas and water edges. While most herons and egrets were observed at off-Airport locations during the WHA, some were seen on the Airport. Most great blue heron sightings were in the trees bordering the Green Harbor River.

Control Methods:

- ◆ Vehicles and pyrotechnics can be used to haze herons off the airfield. They currently cannot be lethally removed. Should none of the previously outlined control measures work, the USDA WS (413-253-2403) may be notified to assist in removal and/or relocation. Appropriate permits shall be obtained prior to control.

3.3.5 Mammals (White-tailed deer and Eastern coyotes)

Deer are the most hazardous wildlife to aircraft according to [AC 150/5200-33B](#). On average, they do more damage when struck by a plane than any other animal. During the WHA, deer were observed on the airfield nearly every month of the year – including on the runway. Airport personnel should continue to haze deer from the Airport, and lethally remove individuals, as necessary, either during the legal hunting season or under the DFW depredation permit.

The eastern coyote is a medium-sized predator that resembles domestic dogs with their large eyes, erect ears, and pointed snouts. Coyotes will commonly cross runways and taxiways to new feeding grounds or use gravel and paved areas as travel corridors because of ease of travel. Coyotes are abundant at GHG as many were observed during daytime and spotlight surveys during the WHA; and signs such as scat and tracks were seen regularly. If coyotes cannot safely be herded off the Airport, measures shall be taken to lethally remove the animals. GHG is permitted to take coyotes under the DFW depredation permit.

4.0 Wildlife Control Permits

Federal, state and local laws and regulations protect wildlife and their habitats. Before any wildlife control measures are employed, the legal status of target species must be determined. Regulating agencies may require special permits to haze, capture or lethally remove wildlife. GHG has a state permit allowing the taking of white-tailed deer, black bears, wild turkeys, coyotes, red foxes, grey foxes, raccoons, woodchucks, striped skunk, and opossum. European starling, blackbirds, crows, house sparrows and rock pigeons can be taken at any time without a permit. GHG is responsible for complying with the current regulations regarding wildlife control and for obtaining and maintaining the necessary permits to take and/or harass target wildlife.

4.1 Federal Regulations

Several federal regulations, including the Migratory Bird Treaty Act (MBTA), the Endangered Species Act (ESA), the Bald and Golden Eagle Protection Act, the National Environmental Policy Act (NEPA), the Lacey Act, and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) regulate various aspects of wildlife management at GHG. Additional regulations may affect wildlife control activities including the Clean Water Act. Several federal agencies are responsible for implementing regulations that may affect wildlife control operations. Most federal wildlife laws are administered by the USFWS and primarily involve migratory birds protected under the MBTA and endangered and threatened species protected under the ESA. Long-eared bat (*Myotis septentrionalis*) is currently the only federally listed species; the long-eared bat is currently listed within the entire east coast, including Massachusetts. However, based on current regulation (4D Rule) and documentation from NHESP no known hibernacula, maternal roosts or individuals are known to occur in the vicinity of the Airport. Depredation permits from the USFWS should be obtained and updated annually unless otherwise stated. For an overview of these acts and regulations and how they affect wildlife and habitat management see GHG's WHA.

Pyrotechnics used for harassment of birds and other wildlife are regulated by the Bureau of Alcohol, Tobacco, and Firearms (ATF). As a municipally owned airport, GHG personnel do not require ATF Explosives Permits. However, ATF storage requirements including reporting to local Fire Official is required. Complete information can be found on the ATF Explosives Pest Control Device Requirements website².

4.2 State and Local Regulations

The DFW is responsible for administering wildlife enforcement. Their applicable statutes can be found on their website (<http://www.mass.gov/eea/agencies/dfg/dfw>). The DFW recognizes federal depredation permits for non-game bird species at airports. DFW requires a special permit for the taking of mammals and game birds outside of hunting seasons.

The NHESP is a division of DFW that promulgates the Massachusetts Endangered Species Act (MESA). NHESP is responsible for the conservation and protection of species that are officially listed as Endangered, Threatened, or of Special Concern in Massachusetts. MESA prohibits the harassment, trapping, and killing of any plant or animal species listed as endangered, threatened or special concern. The DFW periodically updates its List of Endangered, Threatened and Special Concern Species³, since species statuses change over time. A copy of the current state list pertaining to the Town of Marshfield is included in Attachment A. Known state-listed species include the northern harrier, a state-threatened raptor and eastern box turtle, a state-listed species of special concern. The taking of state-protected species may be allowed under certain

² <https://www.atf.gov/explosives/explosives-pest-control-device-requirements>

³ http://www.mass.gov/dfwele/dfw/nhesp/species_info/mesa_list/mesa_list.htm

circumstances. However, a special permit for such actions must be issued by the NHESP prior to any actions involving listed species. GHG's habitat management and mowing within wetland resource areas is restricted by the NHESP approved CMP. This document must be reviewed prior to vegetation management in CMP management areas at GHG.

[State](#) and local [firearms regulations](#) may also affect wildlife control operations at GHG. Personnel should check with local officials or review regulations prior to conducting control measures using firearms to determine if updates to regulations occur.

4.3 Depredation Permits

GHG currently holds a depredation permit from the DFW (Permit Number 005.20APL; provided in Attachment B) for the control of certain mammals. Also, the Airport holds a federal depredation permit (issued by the U. S. Fish and Wildlife Service and co-signed by DFW) to control migratory birds that pose a threat to aircraft safety. GHG will continue to request annual permit renewals from DFW by phone (508-389-6300) prior to the expiration date (December 31 of each year).

The DFW permit authorizes GHG to use non-lethal or lethal control methods on white-tailed deer, wild turkeys, coyotes, red foxes, gray foxes, raccoons, woodchuck, striped skunk, and opossum if they are creating a hazard to aircraft. Other species not expressly listed on the permit may be taken under the permit if they are creating a hazard to aircraft, except endangered or threatened species or species of special concern. Those species taken and not expressly listed on the permit must be reported to DFW within one business day via the phone number above. Additionally, any state-listed species found dead or injured must be reported to the DFW by the first business day following the discovery, and frozen until it can be turned over to DFW or until other Instructions are given by the Division.

No bag limit is incorporated into the permit; however, GHG must report activity under this permit via written report annually to DFW by January 31 of each year. This includes all actions conducted under this permit, a tally of birds and mammals by species taken, and a list of birds and mammals either struck by planes or found dead on the airfield.

Table 4-1 Wildlife Permit Requirements for Marshfield Municipal Airport

Category	Species	State Permit Required	State Permit Obtained	Federal Permit Required	Federal Permit Obtained
Resident Game Birds	Turkey, ruffed grouse, quail, pheasants	Yes	Yes: Turkey. Other species removed must be reported within 1 business day	No	N/A
Resident Non-game Birds ⁴	European starlings, house sparrow, pigeons	No	N/A	No	N/A
Migratory Game Birds	Ducks, geese, coots, snipe, mourning doves	Yes	N/A	Yes	Yes
Migratory Non-game Birds ⁵	All species except game birds, resident non-game, domestic, exotic birds	Yes	N/A	Yes	Yes
Depredation Order Birds ⁶	Crows, blackbirds, grackles, cowbirds	No	Yes: for common crows. Other species removed must be reported in 1 business day	No	N/A
Game Mammals/ Furbearers	Deer, fox (red and gray), rabbits, squirrels, coyotes, raccoons, skunks, opossums, muskrats, weasels	Yes	Yes. Squirrels, muskrat, and weasels are not expressly included in the permit and must be reported in 1 business day.	No	N/A
Game Mammals/ Furbearers	Beaver	No: contact licensed trapper or PAC agent to trap/remove			
Domestic Animals	Domestic poultry, livestock, cats, dogs	No: Call Marshfield Animal Control (781-834-6655 x 174)			
Threatened/ Endangered Species	All species listed in Attachment A	Yes	No	Yes	No

⁴ Starlings, pigeons, and house sparrows are resident non-game birds that are classified as non-migratory, nuisance, and invasive species, and no permit is required to take them.

⁵ Migratory bird permits are not valid for eagles, and threatened and endangered species, which require separate permits for lethal take and harassment.

⁶ 50 CFR 21.43, Depredation order for blackbirds, cowbirds, grackles, crows, and magpies. May be taken without permits “when concentrated in such numbers and manner as to constitute a health hazard or other nuisance”. Under this depredation order no federal permit is required to remove crows.

5.0 Resources

The Airport Manager and designated personnel are responsible for implementing GHG's WHMP and responding to requests to disperse wildlife from runways. The following is an inventory of equipment used for implementing the WHMP. GHG should have a mobile wildlife management kit available to personnel that includes a bird guide, binoculars, wildlife log sheets, pyrotechnics pistols, bird banger and screamers, and a bird strike response kit (see Attachment D). The bird strike response kit should include latex gloves, gallon-sized re-sealable bags, a pen, a permanent marker, and hand sanitizer. These kits are required to be in the vehicle during sweeps and airfield inspections. Trained personnel should keep an adequate supply of equipment on hand. See Table 5-1 for a summary of wildlife hazard materials that should always be available at the Airport.

Table 5-1 Wildlife Hazard Management Supplies

Item	Description
Documentation	Wildlife Hazard Management Plan, including current Federal and State Depredation Permits
	Bird and mammal identification guides.
	Copy of Airport Cooperative Research Program, Report 32: Guidebook for Addressing Aircraft/Wildlife Hazards at General Aviation Airports, 2010.
	Access to Prevention and Control of Wildlife Damage, ed. S.E. Hygnstrom, R.M. Timm, G.E. Larson, 1994 ed., University of Nebraska-Lincoln. Reference manual http://icwdm.org/handbook/index.asp
	Wildlife Hazard Management at Airports: A Manual for Airport Personnel, prepared by E. Cleary and R. Dolbeer, July 2005.
	Wildlife Harassment Log.
Pyrotechnic Supplies	Bird bangers and screamers are available in the mobile wildlife management kit, and one week's supply should be available in storage.
	Launchers. The Airport maintains a supply of 15mm pyrotechnic shotgun launchers and caps. One shotgun launcher should be available in the mobile wildlife management kit. One week's supply of caps should be available in storage.
Monitoring equipment	Binoculars. One pair of binoculars should be kept in the mobile wildlife management kit.
Miscellaneous	Each vehicle used for Airport inspections shall be equipped with horns, spotlight and radio communications.
	Rat/mouse snap traps
	Bird strike response kit including protective gloves, FAA bird strike form (Form 5200-7), re-sealable bags, pen and marker, alcohol wipes, gauze pads, hand sanitizer wipes, garbage bags, gallon-size food storage bags, and buckets. Replacement supplies.

Additional supplies such as distress calls, air horns, Mylar tape, bioacoustics, mammal traps and firearms may be necessary as specific situations arise. The Airport Manager shall ensure that items can be procured in a timely manner. See Attachment C for a list of wildlife control suppliers.

6.0 Procedures during Aircraft Operations

6.1 Overview

GHG shall take measures to alleviate imminent threat wildlife hazards whenever there are detected or reported. GHG personnel should frequently conduct physical inspections and document actions as part of the daily protocol.

Wildlife hazards at airports are variable and complex; therefore, it is essential to adopt a flexible and adaptive approach to managing hazards. If it is determined that a wildlife hazard exists due to one or more of the risk factors (species, location, behavior, number and/or airfield condition) then GHG should act to resolve the situation. Methods used to reduce hazard(s) will become increasingly more aggressive and used in combination with one another until wildlife responds favorably or the hazard is abated. Generally, this involves vehicular harassment, including lights and horns, then air horns or pyrotechnics. In those cases where wildlife are non-respondent or the situation is becoming increasing more hazardous, lethal removal shall be necessary. Prior to lethal removal GHG shall make positive identification and ensure that the proper permit is retained as listed in Section 4. Wildlife identification guides are available for use. Additionally, reference documents outlined above are available in the Airport Manager's office.

GHG shall identify severe strike potential where wildlife is present in the immediate vicinity of the runway or there is high activity. In these cases, GHG will alert the flying public via UNICOM and immediately work to reduce or abate strike potential; should the activity prove to be ongoing or not immediately mitigated, the Airport Manager will issue a NOTAM describing the situation and risks. Pilots may consider delaying flights until the bird watch NOTAM is removed.

6.2 Wildlife Inspections and Control

Routine inspections of the airfield will help GHG identify levels of wildlife activity and increase the effectiveness of the wildlife control methods described in Section 3. Wildlife inspections shall be conducted under the following circumstances:

- ◆ *Sunrise or upon Airport staff arrival for the day.* This sweep will be completed in conjunction with the daily runway and lighting inspections and recorded in the daily log. Many bird and mammal species are particularly active during the early morning hours.
- ◆ *After a wildlife strike.* A thorough inspection of the runway should be conducted immediately following a wildlife strike and prior to subsequent aircraft operations in order to identify and mitigate the related attractant and clear any debris.

- ◆ *Upon request.* At the request of a pilot, or any other source, an inspection should be conducted.

Wildlife inspections shall be considered under the following circumstances:

- ◆ *Opening or reopening a runway.* If a runway has been closed for 30 minutes or more, a wildlife inspection may be conducted before resuming aircraft operations.
- ◆ *Seasonal increases.* Additional wildlife inspections may be conducted should evidence of seasonal threats occur, including sunset sweeps to detect waterfowl or coyotes in the stormwater ditch during winter and early spring until hazards are abated.

GHG shall monitor and respond to wildlife hazards on the airfield. Staff shall record and report daily and subsequent sweeps. Should carcasses be found on or near the runway, a strike should be assumed and recorded on the FAA bird strike form ([FAA Form 5200-7](#)). All carcasses within 250 feet of the centerline of the runway will be considered the result of a strike unless death was obviously due to some other cause. Remains will be processed (time and date found, location on runway, person who found remains, etc.), documented on the strike form and wildlife log, and disposed of by burial or incineration.

Responding to Imminent Hazards

If a hazard is observed that may compromise immediate safety of air traffic, GHG personnel should delay arriving or departing air traffic until the hazard is abated.

Wildlife management activities (hazing or lethal control) can create a temporarily increased hazard (e.g. flocks departing after management efforts) until the hazard is moved/removed from the airfield. Therefore, wildlife management activities must consider arriving and departing aircraft and control efforts shall be coordinated over the GHG's UNICOM.

The key to successful wildlife control is persistence, innovation and a clear understanding of the risks associated with certain species. The initial response for most species will be to haze wildlife using frightening devices, including vehicles and pyrotechnics, followed by lethal management methods when hazing is unsuccessful. Most management techniques retain their effectiveness when used judiciously and persistently until the threat has been removed and in conjunction with other methods.

Effective wildlife control requires careful habitat management practices along with an active harassment and depredation program. GHG currently uses vehicles harassment and pyrotechnics to haze wildlife.

- ◆ Vehicle chasing combined with horns and/or lights are simple, effective methods to disperse wildlife from the runway system. This can be reinforced with air horns.

- ◆ Pyrotechnic pistols shall be the most commonly used control device, following vehicular harassment. A combination of screamers and bangers are most effective. Pyrotechnics shall be readily available to ensure the fastest possible reaction time. Pyrotechnics are regulated by the ATF. While the Airport is exempt from the licenses required to purchase pyrotechnics, GHG must meet the appropriate storage requirements. Personnel shall be properly trained in the safe usage and storage of pyrotechnics. Care must be taken to not over use the device or become complacent about safety.

GHG is authorized to haze and remove hazardous species at the Airport.

- ◆ Depredation is used only to remove persistent wildlife and to reinforce methods in a program of escalating harassment. When an individual or population of wildlife fails to respond to pyrotechnics, bioacoustics, and other visual and auditory methods of harassment, shooting may be required. A copy of the state DFW permit is provided in Attachment B. If necessary, GHG may utilize USDA WS when more aggressive wildlife controls are deemed necessary.

6.3 GHG Grounds Management

GHG shall maintain the grass height at six to 14 inches, where possible. Grass located immediately adjacent to the runway and taxiway lighting system may be shorter. GHG mows drainage ditches and other hard-to-maintain areas, as feasible and in accordance with the VMP and CMP. GHG shall keep clean grounds without trash and debris. Trash receptacles shall be kept closed, tidy and segregated on Airport grounds.

7.0 Review and Training

7.1 WHMP Review and Evaluation

To ensure that the wildlife program is effective and action is being taken to alleviate wildlife-aircraft interactions to the maximum extent practicable, this WHMP will be reviewed periodically and revised as necessary. Periodic changes to the WHMP will be submitted to a New England FAA Environmental Protection Specialist. The WHMP shall accurately reflect current practices and procedures for mitigating wildlife hazards and support GHG and FAA safety requirements.

7.2 Training

Personnel actively involved in the implementation of this WHMP shall receive initial and recurrent hazardous wildlife management training that will address the material referenced in the FAA AC 150/5200-36B: [Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports](#). For non-Part 139 airports, it is suggested that this training course is attended annually. This training

will optimize the effectiveness of methods and ensure continued compliance with federal and state regulations. Additionally, personnel will receive periodic safety, radio communications, driving on the airfield and safe use of pyrotechnics training. All earned training certificates shall be kept in the Airport Manager's office.

**ATTACHMENTS TO WILDLIFE HAZARD MANAGEMENT PLAN
INTENTIONALLY REMOVED**



Appendix E

[Fish and Wildlife Service]

Information for Planning and Consultation (IPaC)



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
<http://www.fws.gov/newengland>

In Reply Refer To:

December 01, 2020

Consultation Code: 05E1NE00-2021-SLI-0568

Event Code: 05E1NE00-2021-E-01740

Project Name: Extension of Existing Airport Wildlife Management / Perimeter Fence

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office

70 Commercial Street, Suite 300

Concord, NH 03301-5094

(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2021-SLI-0568

Event Code: 05E1NE00-2021-E-01740

Project Name: Extension of Existing Airport Wildlife Management / Perimeter Fence

Project Type: ** OTHER **

Project Description: Much of the Airport has existing wildlife management fencing; however, there are certain areas that are not enclosed by a wildlife management fence and the FAA has recommended that the Airport seek approvals to extend the wildlife management fencing through the remaining few open areas and to repair areas with failing fencing.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/42.09796750400261N70.67365679810366W>



Counties: Plymouth, MA

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.



Appendix F

The Public Archaeology Laboratory, Inc.

**INTENSIVE ARCHAEOLOGICAL SURVEY
AND SUPPLEMENTAL SITE EXAMINATION**

MARSHFIELD MUNICIPAL AIRPORT-GEORGE HARLOW FIELD

RIGHT-OF-WAY EASEMENT ACQUISITION

AND PERIMETER FENCE PROJECT

TECHNICAL REPORT

**INTENSIVE ARCHAEOLOGICAL SURVEY
AND SUPPLEMENTAL SITE EXAMINATION
MARSHFIELD MUNICIPAL AIRPORT-GEORGE HARLOW FIELD
RIGHT-OF-WAY EASEMENT ACQUISITION
AND PERIMETER FENCE PROJECT**

Marshfield, Massachusetts

Duncan Ritchie

Submitted to:

Submitted to:
Airport Solutions Group, LLC
39 Winn Street
Burlington, MA 01803

Submitted by:

The Public Archaeology Laboratory, Inc.
26 Main Street
Pawtucket, Rhode Island 02860



PAL Report No. 3622

January 2020
(Revised March 2020)

In 2019, an intensive archaeological survey (identification) and archaeological site examination (evaluation) were completed for the Marshfield Municipal Airport-George Harlow Field Right-Of-Way (ROW) Easement Acquisition and Perimeter Fence Project in Marshfield, Massachusetts. All tasks associated with the survey were carried out in accordance with the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (63 FR 20496) and the Massachusetts Historical Commission's *Public Planning and Environmental Review: Archaeology and Historic Preservation* (1979). Previous archaeological investigations conducted for infrastructure improvements at Marshfield Municipal Airport-George Harlow Field indicated that the Area of Potential Effect (APE) for the perimeter fence project includes sections of the Marshfield Airport Site (19-PL-426). This site contains 10 loci of pre-contact Native American settlement and evidence of occupation spanning 9,000 years from the late Paleo-Indian Period to the Late Woodland Period. Locus 9 of this site also contains the post-contact Waterman House Site (MRS.HA.11), the location of a small house occupied circa 1638 to mid-1640s with an associated palisade wall and possible garden area or animal pen and a Plantation/Colonial Period (1620–1675) occupation (MARS.HA.12).

The Marshfield Airport and Waterman House sites were determined eligible for listing in the National Register of Historic Places by the Federal Aviation Administration (FAA) during previous consultations. However, the portions of Loci 1 and 9 within the APE for the current Project have low information content and do not retain enough integrity to be considered potentially significant archaeological resources. **Further study of Loci 1 and 9 of the Marshfield Airport Site and of the Waterman House Site for the Marshfield Municipal Airport-George Harlow Field ROW Easement Acquisition and Perimeter Fence Project, as currently planned, is unlikely to yield new information, and no additional archaeological investigation is recommended.**



Appendix G

[Massachusetts Natural Heritage Endangered Species Program]

Conservation Management Permit CMP Amendment



DIVISION OF FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6300 | f: (508) 389-7890
MASS.GOV/MASSWILDLIFE

MA ENDANGERED SPECIES ACT (G.L. c.131A) **AMENDMENT TO** **CONSERVATION AND MANAGEMENT PERMIT**

DATE:	March 3, 2021
CONSERVATION PERMIT NO.:	013-199.DFW
NHESP FILE NO.:	04-16183
PERMIT HOLDER:	Airport Commission Town of Marshfield 93 Old Colony Lane Marshfield MA 02051
PROJECT:	2013 CMP: George D. Harlow Field Runway Safety Improvements 2021 CMP Amendment: Perimeter Fence Extension and Replacement

Pursuant to the authority granted in the Massachusetts Endangered Species Act (MESA) (G.L. c. 131A) and its implementing regulations (321 CMR 10.23), the Director of the Massachusetts Division of Fisheries & Wildlife (the "Division") hereby amends Conservation and Management Permit 013-199.DFW (the "Permit"). The Permit was originally issued to the Airport Commission, Town of Marshfield (the "Permit Holder") on June 20, 2013 to authorize the Taking of Eastern Box Turtle (*Terrapene carolina*) resulting from the impacts associated with 9 different improvement and safety projects, including, perimeter fence replacement (the "Project") on a 135-acre site located at George D. Harlow Field, 93 Old Colony Lane, Massachusetts (Book 3372, Page 174, Plymouth County Registry of Deeds; the "Property").

As part of the Permit, the Permit Holder is required to a) execute an EEA-DCS approved Conservation Restriction on ±101 acres of land, b) provide off-site land protection funding to the Eastern Box Turtle Mitigation Bank, c) create and maintain ±5 acres of Nesting Habitat and d) implement the Vegetation Management Plan. The Director has determined that the Permit Holder has implemented the conservation plan detailed in the Permit. The long-term Net Benefit requirements detailed above and in the Permit have components for which the Permit Holder has ongoing responsibilities unchanged by the amendment to the Permit (the "2021 Permit Amendment").

MASSWILDLIFE

This 2021 Permit Amendment is issued to the Permit Holder to authorize the installation, maintenance and replacement of the perimeter fence with “turtle gates” including a 1,350 linear feet (LF) perimeter fence extension and a 4,000 SF conversion of forest into early-successional habitat (the “Work”). The forested habitat provides Eastern Box Turtle overwintering habitat and will be converted to early-successional migratory and foraging habitat as a result of the Work.

Detailed within the request for an amendment to the Permit and as a result of the 4,000 SF (0.09 ac) loss of overwintering habitat, the Permit Holder has proposed to amend the Net-Benefit conservation plan to provide additional off-site land protection funds, in the amount of \$2,117.00, to the Eastern Box Turtle Mitigation Bank. The Permit Holder will implement measures to minimize impacts and protect Eastern Box Turtles associated with the Work in accordance with Special Conditions 17, 20 & 21 of the Permit which require a turtle protection plan, turtle gates in the perimeter fence, and construction staff education.

By way of this 2021 Permit Amendment, the Permit expiration date has been modified. All other provisions, terms and conditions of the Permit shall remain in effect and unchanged.

In accordance with the documents submitted to the Division entitled:

- “WILDLIFE MANAGEMENT/SECURITY FENCE PLAN” (Sheet 1 of 5, dated October 2020, revision noted 2/19/21; prepared by ASG the “Site Plan”; [Attachment 1](#));
- *Marshfield Airport Conservation Permit #103-199.DFW; NHESP File No. 04-16183 Request for Amendment for Extension of Existing Airport Wildlife Management/Perimeter Fence* (dated September 1, 2020; prepared by GZA)

and any other plans and documents referenced herein, this 2021 Permit Amendment is issued with the following conditions:

2021 Permit Amendment Conditions:

1. Permit Extension: This 2021 Permit Amendment extends the expiration date of the Permit from 20 June 2018 (General Condition 1) until March 3, 2026.

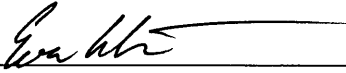
Supplement to Special Condition #16 of the Permit

2. Eastern Box Turtle Off-site Mitigation: In order to provide a Net Benefit to the conservation of the State-listed species impacted by the Work identified in this 2020 Amendment, the Permit Holder shall provide \$2,117.00 (the “Funds”) for land protection, conservation research, habitat management, and or conservation planning to benefit the Eastern Box Turtle in Massachusetts. The Permit Holder has chosen to fulfill this obligation by providing restricted funding to the Eastern Box Turtle Mitigation Bank operated by The Nature Conservancy (“TNC”) (pursuant to the Off-site Mitigation Memorandum of Agreement between the Division and TNC, dated July 16, 2008 and amended October 29, 2009), or another party designated in writing by the Division. Said funds shall be restricted and used exclusively to provide Net Benefit mitigation for the Eastern Box Turtle in Massachusetts. Prior to the start of Work, the Permit Holder shall send a letter to the Division confirming the date of said transfer and include written confirmation of transfer receipt by TNC.

Supplement to Special Condition #20 of the Permit

3. Perimeter Fence Construction and Monitoring: The Permit condition is hereby modified to include the perimeter replacement and extension (1,350 LF) and this Work shall be constructed in compliance with all requirements of this Permit condition: *The perimeter fence shall be constructed to include turtle gates as shown in the plans entitled "Turtle Gate Plans" (dated January 2011; prepared by GZA GeoEnvironmental) in the Nesting Habitat Creation Plan. Within five (5) days of completion of fence installation, the fence shall be inspected by a qualified turtle biologist who shall verify that the turtle gates have been installed properly, in accordance with the Plans. The inspector shall provide an inspection report to the Division within five (5) days of completing the inspection. As described in the Nesting Habitat Creation Plan, the fence shall be inspected at least once annually, and maintained as necessary to ensure that turtle gates remain passable and free of accumulated debris. Within five (5) days of completing the annual inspection, the Permit Holder shall provide a letter to the Division stating the inspection date, findings, and required maintenance that was conducted, if any.*
4. Recordation: Within thirty (30) days of issuance, the text of this 2021 Permit Amendment shall be recorded in the Registry of Deeds or the Land Court for the district in which the Property is located, so as to become a record part of the chain of title of the Property. In the case of recorded land, the Permit shall be noted in the Registry's Grantor Index under the name of the owner of the Property upon which the proposed work is to be done. In the case of registered land, the Permit shall be noted on the Land Court Certificate of Title of the owner of the Property upon which the proposed work is done. The Permit Holder shall submit to the Division a date-stamped and signed copy of said recorded Permit Amendment, showing the date and book and page of recording of said Permit Amendment, within five (5) days after recording and/or filing, as applicable. No Work shall begin on the Property until the Permit Amendment is recorded and said recorded copy is submitted to the Division, except as otherwise approved by the Division in writing.

All other provisions, terms and conditions of the Permit shall remain in effect and unchanged.



Everose Schlüter, Ph.D.

Massachusetts Division of Fisheries & Wildlife

On this 3rd day of March, 2021, before me, the undersigned notary public, personally appeared Everose Schlüter, Ph.D., Assistant Director, proved to me through satisfactory evidence of identification, which was personal knowledge, to be the person whose name is signed on the preceding or attached document, and who swore or affirmed to me that the contents of the document are truthful and accurate to the best of his/her knowledge and belief.

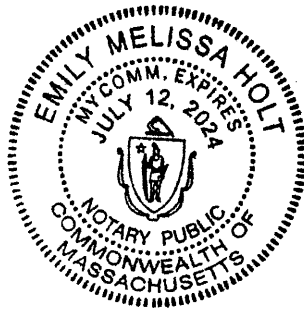


Emily Melissa Holt, Notary Public

My Commission expires: July 12, 2024

Conservation Permit 013-199.DFW

Amended this 3rd day of March 2021



MASSWILDLIFE

**ACKNOWLEDGEMENT AND ACCEPTANCE OF ALL TERMS OF THIS PERMIT
AMENDMENT**

The undersigned below agrees that commencement of any work authorized by and described in this Permit Amendment constitutes acknowledgement and acceptance of all terms of this Permit Amendment.

Signatory 1 Organization	

COMMONWEALTH OF MASSACHUSETTS

On this _____ day of _____, 2016, before me, the undersigned notary public, personally appeared _____, proved to me through satisfactory evidence of identification which was _____ to be the person whose name is signed on the preceding or attached document, and who swore or affirmed to me that the contents of the document are truthful and accurate to the best of his/her knowledge and belief.

Notary Public

SEAL

My commission expires: _____

**SIGNATURE WILL BE INCLUDED IN
FINAL EA AFTER PUBLIC COMMENT
PERIOD**

MASSWILDLIFE

Distribution List

Steve Riberdy, GZA GeoEnvironmental, Inc.
Seth Taylor, GZA GeoEnvironmental, Inc.
Marshfield Board of Selectmen
Marshfield Planning Board
Marshfield Conservation Commission
DEP Southeast Regional Office, Wetlands Program
Jason Zimmer, DFW Wildlife District Office

Attachment 1

“WILDLIFE MANAGEMENT/SECURITY FENCE PLAN” (Sheet 1 of 5, dated October 2020, revision noted 2/19/21; prepared by ASG)

