

PROPOSAL FOR 20-YR FUTURE DESIRED CONDITION OF SPECIFIC KIRTLAND'S WARBLER WILDLIFE MANAGEMENT AREA PARCELS (MICHIGAN, 2015)



Per the 2013 *Habitat Management Plan*, the natural range of variation in the compositional and structural patterns of vegetation that result from wildfire in jack pine (*Pinus banksiana*) ecosystems should provide the “desired future condition” for Kirtland’s Warbler (*Setophaga kirtlandii*) habitat management at Kirtland’s Warbler Wildlife Management Area.

Introduction

Based on the 2013 *Habitat Management Plan* (HMP) for Kirtland's Warbler Wildlife Management Area (KWWMA), the following approach to land (habitat) management was approved:

1. Future management should be disturbance ecology-based and consider the range of conditions encountered across jack pine (*Pinus banksiana*) seral states or age classes: from mature, closed-canopy forests to openland-dominated pine barrens.
2. Habitat management should focus on promoting the "natural range of variability" within the context of the *Refuge Improvement Act* and the *Biological Integrity Policy*.
3. Approaches to management should be both "meso-filtered" and "fine-filtered". Although jack pine plantation management will still be an important consideration, the HMP deemphasizes (but does not abandon) the management of this anthropogenic habitat and provide the framework for a better balance between the approaches of restoration ecology and conservation biology.
4. Because fire, as the main ecological process, has been severely altered in northern Lower Michigan, research and management should focus on understanding and promoting wildfire patterns, while working with others to promote prescribed fire use.

This document outlines a **non-binding 20-year strategy for the management of specific KWWMA lands (2015-2035)**. Input from Michigan Department of Natural Resources staff (Keith Fisher and Keith Kintigh) was critical in this process. The following assumptions and considerations were made before making management suggestions for future conditions:

1. Representation across seral stages of jack pine ecosystems should be maintained. That is, openland-dominated pine barrens and mature forests should always be represented among the conditions found at KWWMA as should conditions used by breeding warblers (e.g., plantations or fire-generated habitat of ~5-23 year old jack pine of suitable density and structure).
2. Because timber production is not a requirement at Kirtland's Warbler WMA, this should facilitate the conservation of mature conditions (no need to cut due to tree mortality) and the

desire to provide the more ecoregionally-rare barrens condition (e.g., unstocked stands are acceptable).

3. Landscape context is important; parcels were evaluated based on their size and location and adjacency to other managed lands. For instance, small tracts that would be difficult to manage via typical commercial harvesting due to their small size and low volume would be left as residual structure relative to the surrounding lands that will likely to be managed intensively by MDNR. Large tracts that may provide habitat for area-sensitive species were considered in that light as well.
4. Relationships to providing more natural landscape patterns and reducing fuel loading for effective fire management were considered, especially within the context of providing more area of pine barrens (ongoing research by Wayne State University may further guide management in this vein).
5. Based on field observations, it is assumed that many plantations will not mature into similar structure as mature wildfire-generated stands. Thus, maintaining fire-generated mature stands may provide a more natural condition on the landscape.
6. Sites with soil conditions not favorable to jack pine will be managed for forest conditions more suited to those soils. Some aspen may be managed to produce early successional conditions.
7. Barrens will primarily be managed by cutting plantations that become too old for warblers; a market for low-quality forest products will be necessary.
8. Mature stands, in many instances, will provide reserve areas in which treatments to produce young plantations can occur if the need arises (e.g., population decline in warblers necessitates increased intensity of management and more plantations).

Habitat Goals, Objectives, and Strategies (Desired Future Condition, from HMP)

Goal—Manage habitat to support Kirtland's Warblers and associated wildlife species by providing the natural range of variation of conditions across all seral stages of the jack pine ecosystem. Employ sound management practices that emulate patterns of structure and composition resulting from wildfire and other natural disturbances (Figure 1).



Objective—Continue to manage jack pine tracts (stands) in conjunction with the Michigan DNR, but place greater emphasis on promoting ecological integrity within managed stands.

Figure 1. Resulting structural patterns from prescribed fire (left center) and plantation management (surrounding area). Patterns from fire should provide the “desired future condition” for managed tracts.

Rationale—Because many plantations at KWWMA are ecologically simplified and lack the structural and compositional diversity of stands produced by wildfire, future management should consider all seral stages of jack pine ecosystem development, from barrens to mature forest, and strive to emulate natural conditions in each stage that result under a natural fire regime.

Strategies:

1. Work with Federal, State and local fire officials to employ prescribed fire as a management tool.
2. Develop research demonstration sites that exemplify ecologically-based jack pine management and illustrate how emulating natural conditions can provide multiple species benefits.
3. Manage parcels that contain habitats other than jack pine to emulate patterns resulting from natural disturbances. Sites not well suited for jack pine should be managed for other (often, mixed) forest types/ecosystems. For instance, many of the unmanaged tracts in Clare County are better suited for a mixed-aspen community and should be managed as such to provide habitat for species like the Golden-winged Warbler (*Vermivora chrysoptera*).

4. Elsewhere, attempt to emulate the compositional and structural patterns of jack pine stands resulting from wildfire via mechanical treatments (timber sales) with consideration of the following

Management Units — Across KWWMA, tract size varies from <10 acres to >700 acres; average tract size is 56 acres, the median size is 39 acres. The original acquisition goal was to acquire 7,500 acres of land on which habitat would be managed for the benefit of Kirtland's Warbler. At present, the area contains approximately 6,869 acres (a slight deviation from the number reported in the CCP). Most of these tracts are located within or adjacent to state forest lands also managed for the Kirtland's Warbler. As of May 2014, 4,618 acres (67%) had been treated and were in the 5-23 year old jack pine age class whereas 2,171 acres (32%) were in mature or an untreated state and/or were non-jack pine sites. [These numbers are crude because not every single acre in a tract is treated, but the relative breakdown across the two jack pine age classes is accurate.]

Table 1. Kirtland's Warbler WMA management history, ranked by county with the most acres as of May 2014. Plans are in place to harvest at the Ruth Rd. Sale (1 parcel, Oscoda Co.) and Staley Lk. and Barker Lk. Rd. sales (multiple parcels, Crawford Co.). The vast majority of past management had the goal of producing breeding habitat for Kirtland's Warbler (1 prescribed fire, the rest plantations). See Appendix 1 for tract maps.

County	Number of GIS Records (Ownership Polygons)	Number (%) Ownership Polygons Already Managed	Ownership Acres (Not Treatment Acres)
Ogemaw	49	23 (47%)	2,911
Clare	26	19 (73%)	1,401
Oscoda	22	18 (82%)	1,410
Crawford	24	15 (63%)	788
Presque Isle	1	1 (100%)	199
Kalkaska	1	1 (100%)	80
Roscommon	1	0 (0%)	40
Montmorency	1	1 (100%)	40
Total	125	78 (62%)	6,869

Table 2. Habitat (age) class distribution of parcels at Kirtland's Warbler WMA over the next 20 years (future condition as of 2035) as proposed by Seney NWR staff. Barrens refer to primarily unforested conditions, KW habitat refers to stands in 5-23 year jack pine with appropriate structure, and mature jack pine refers to stands >23 years (see Corace et al. 2010b). Other habitat refers to sites not suitable to jack pine. The same codes apply to the associated shapefile under the field "SNWR2035." See Appendix 2 for tract maps.

County	Number of GIS Records (Ownership Polygons)	Number (%)Polygons In Jack Pine Barrens Habitat	Number (%)Polygons In KW Jack Pine Habitat	Number (%)Polygons In Mature Jack Pine Habitat	Number (%)Polygons In Other Habitat
Ogemaw	49	9 (18%)	19 (39%)	21 (43%)	0
Clare	26	14 (54%)	4 (15%)	5 (19%)	3 (12%)
Oscoda	22	13 (59%)	5 (23%)	4 (18%)	0
Crawford	24	3 (13%)	7 (29%)	14 (58%)	0
Presque Isle	1	0	0	1 (100%)	0
Kalkaska	1	0	0	1 (100%)	0
Roscommon	1	0	1 (100%)	0	0
Montmorency	1	0	0	1 (100%)	0
Total	125	39 (31%)	36 (29%)	47 (38%)	3 (2%)

Table 3. Habitat (age) class distribution of parcels at Kirtland's Warbler WMA over the next 20 years (future condition as of 2035) as proposed by MDNR staff. Barrens refer to primarily unforested conditions, KW habitat refers to stands in 5-23 year jack pine with appropriate structure, and mature jack pine refers to stands >23 years (see Corace et al. 2010b). Other habitat refers to sites not suitable to jack pine. The same codes apply to the associated shapefile under the field "MDNR2035." See Appendix 3 for tract maps.

County	Number of GIS Records (Ownership Polygons)	Number (%)Polygons In Jack Pine Barrens Habitat	Number (%)Polygons In KW Jack Pine Habitat	Number (%)Polygons In Mature Jack Pine Habitat	Number (%)Polygons In Other Habitat
Ogemaw	49	17 (35%)	6 (12%)	26 (53%)	0
Clare	26	0	18 (69%)	5 (19%)	3 (12%)
Oscoda	22	0	16 (73%)	6 (27%)	0
Crawford	24	4 (17%)	5 (21%)	15 (63%)	0
Presque Isle	1	0	0	1 (100%)	0
Kalkaska	1	0	0	1 (100%)	0
Roscommon	1	0	1 (100%)	0	0
Montmorency	1	0	0	1 (100%)	0
Total	125	21 (17%)	46 (37%)	55 (44%)	3 (2%)

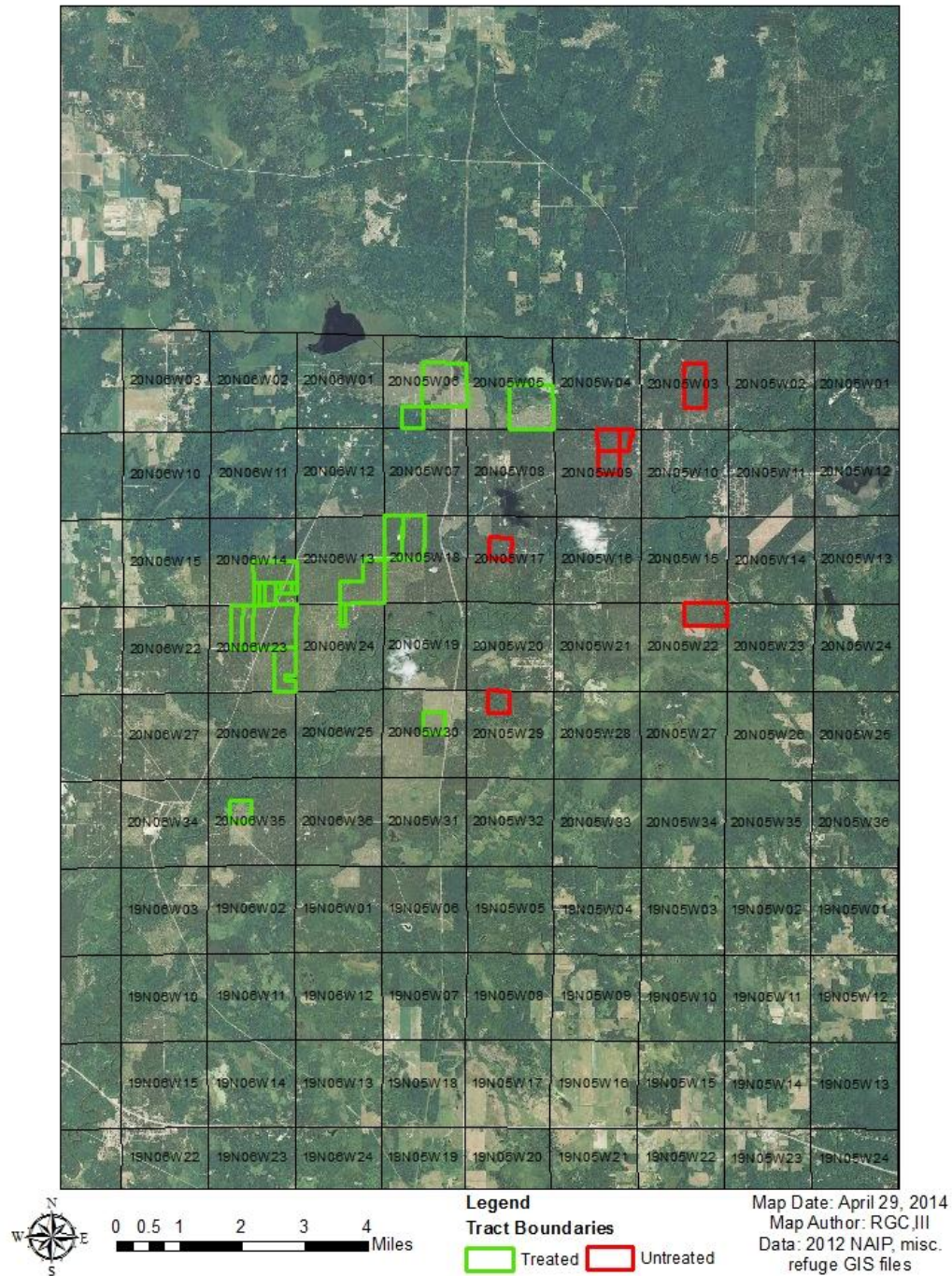
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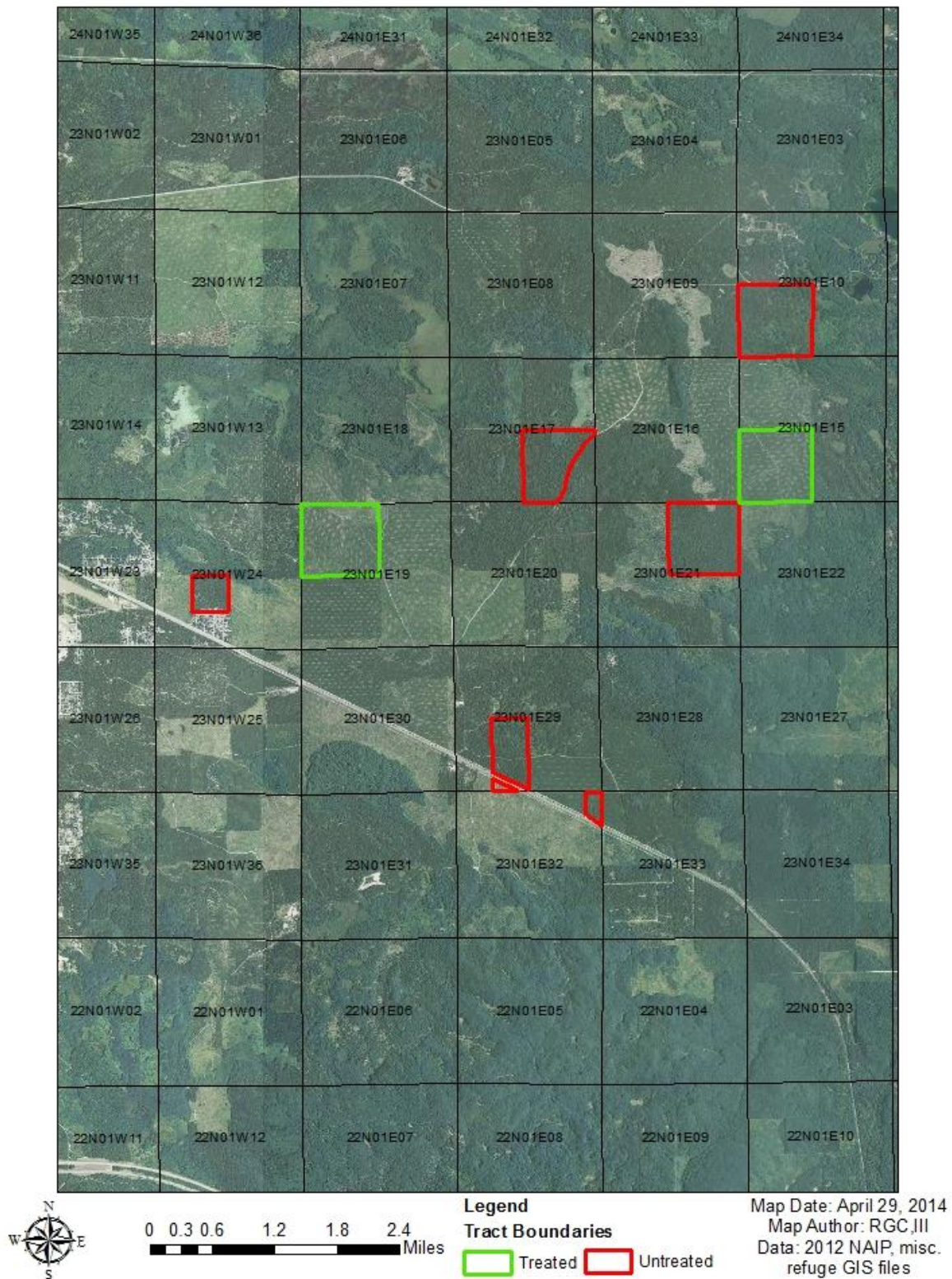
Appendix 1. Maps of lands/tracts illustrating those which have been treated (green) and those which have not been treated (red) as of May 2014. Plans are place to harvest at the Ruth Rd. Sale (1 parcel, Oscoda Co.) and Staley Lk. and Barker Lk. Rd. sales (multiple parcels, Crawford Co.).

Treated and Untreated Tracts: Kirtland's Warbler Wildlife Management Area (Clare Co., MI, 2014)

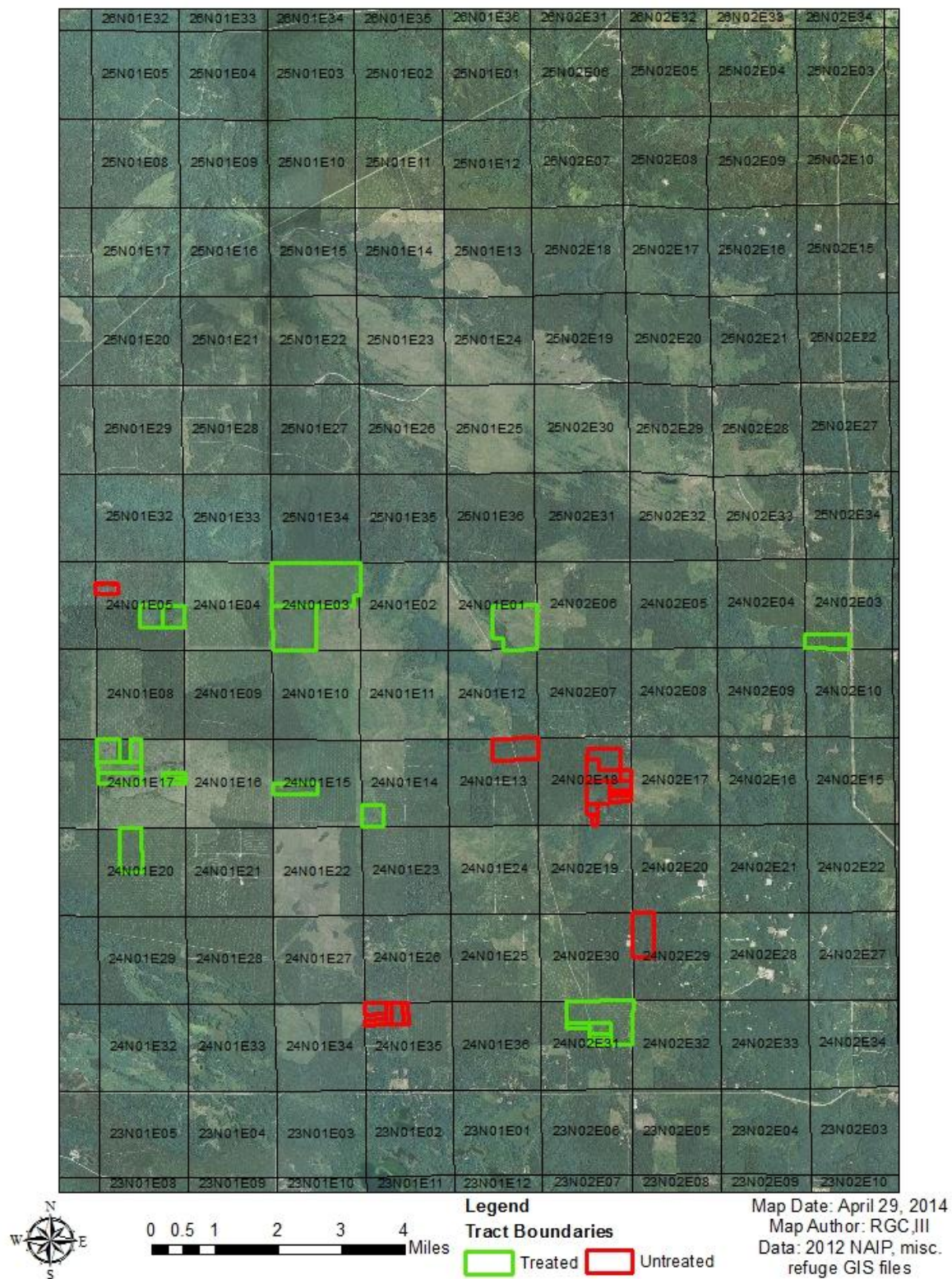
U.S. Fish and Wildlife Service



**Treated and Untreated Tracts: Kirtland's Warbler Wildlife Management Area
(Roscommon Co. and Ogemaw Co. (south), MI, 2014)**
U.S. Fish and Wildlife Service



**Treated and Untreated Tracts: Kirtland's Warbler Wildlife Management Area
(Ogemaw Co. (north), MI, 2014)**
U.S. Fish and Wildlife Service



**Treated and Untreated Tracts: Kirtland's Warbler Wildlife Management Area
(Kalkaska Co., MI, 2014)**

U.S. Fish and Wildlife Service

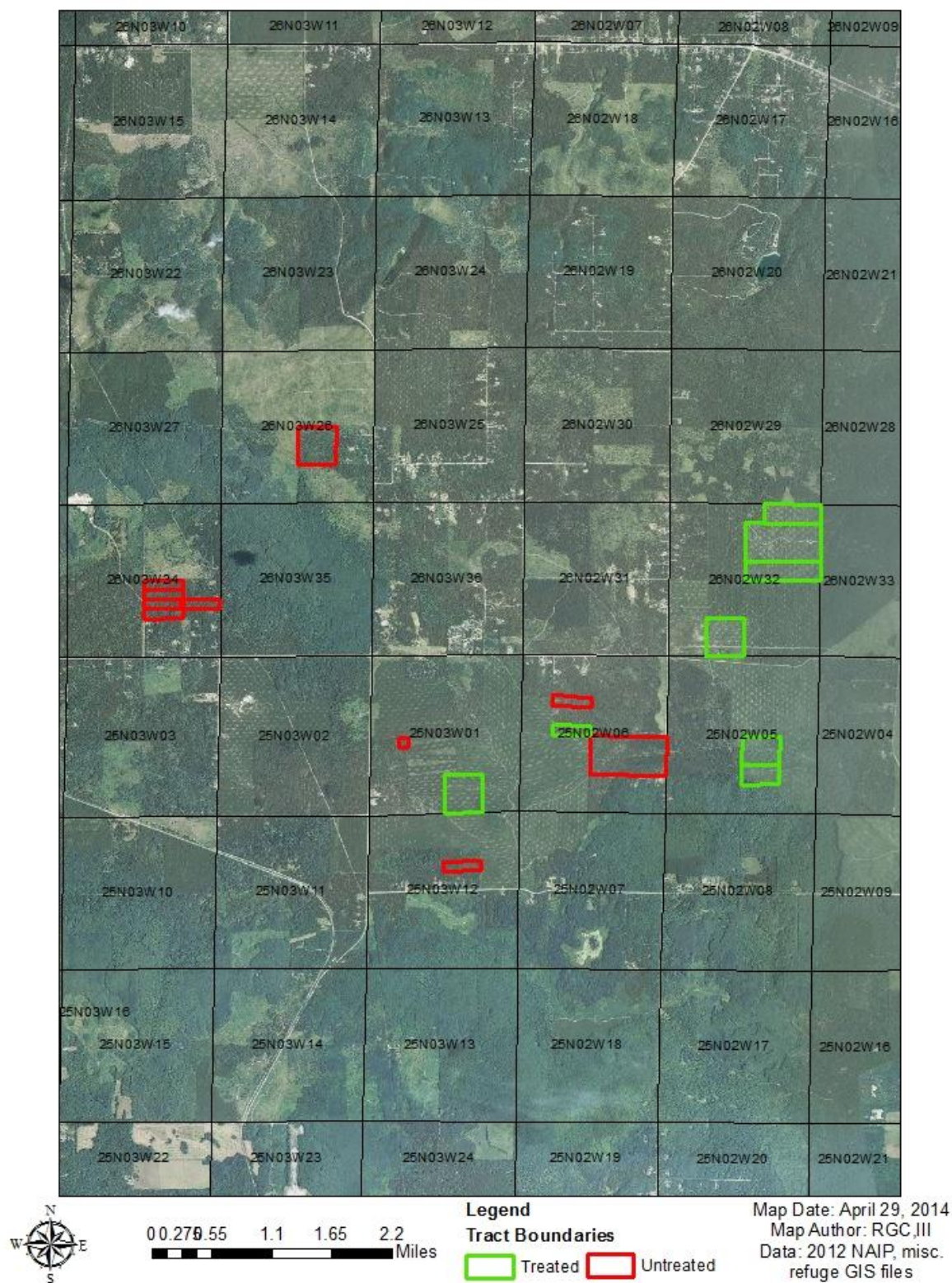


**Treated and Untreated Tracts: Kirtland's Warbler Wildlife Management Area
(Crawford Co. (west), MI, 2014)**
U.S. Fish and Wildlife Service



**Treated and Untreated Tracts: Kirtland's Warbler Wildlife Management Area
(Crawford Co., MI, 2014)**

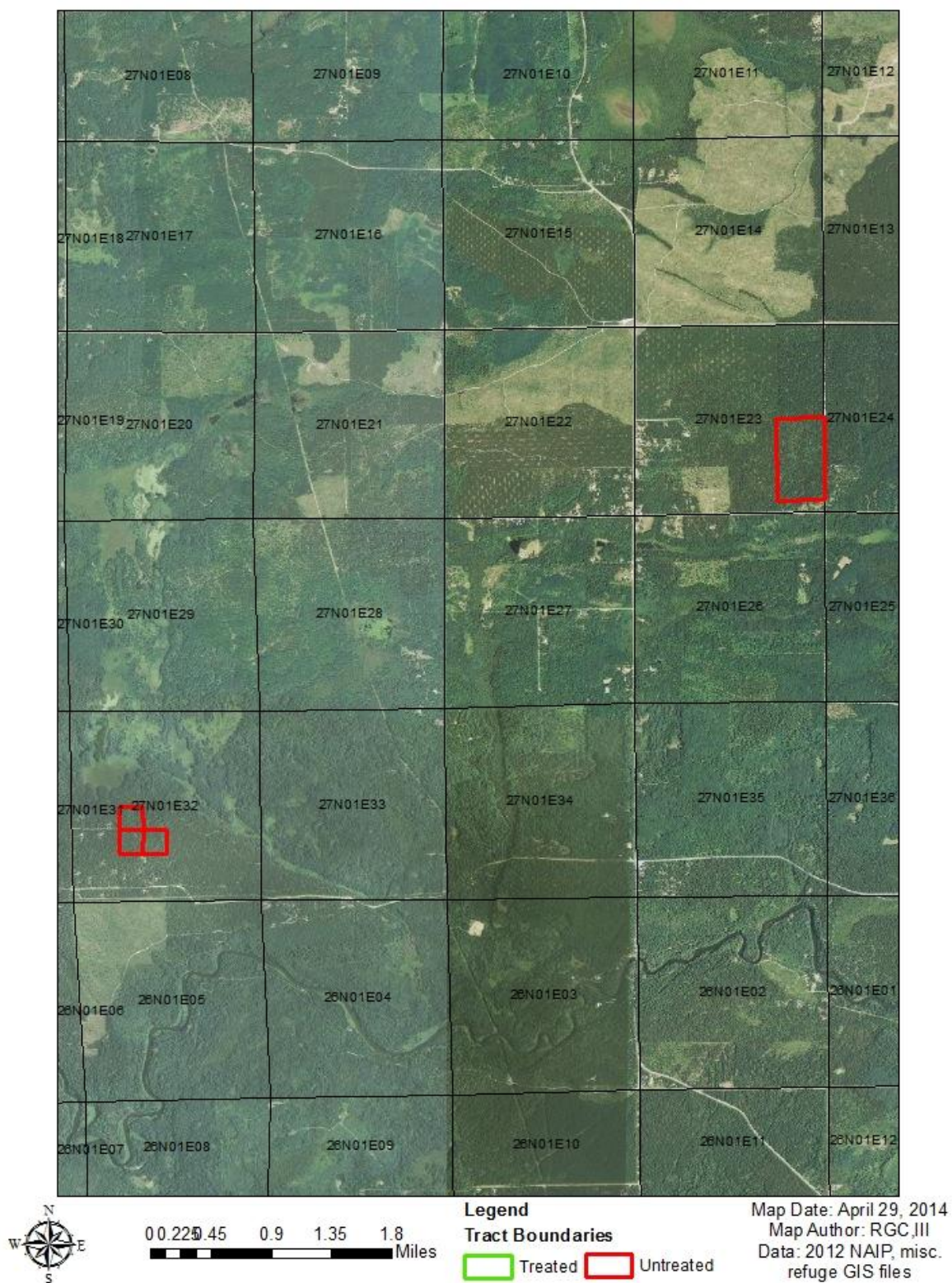
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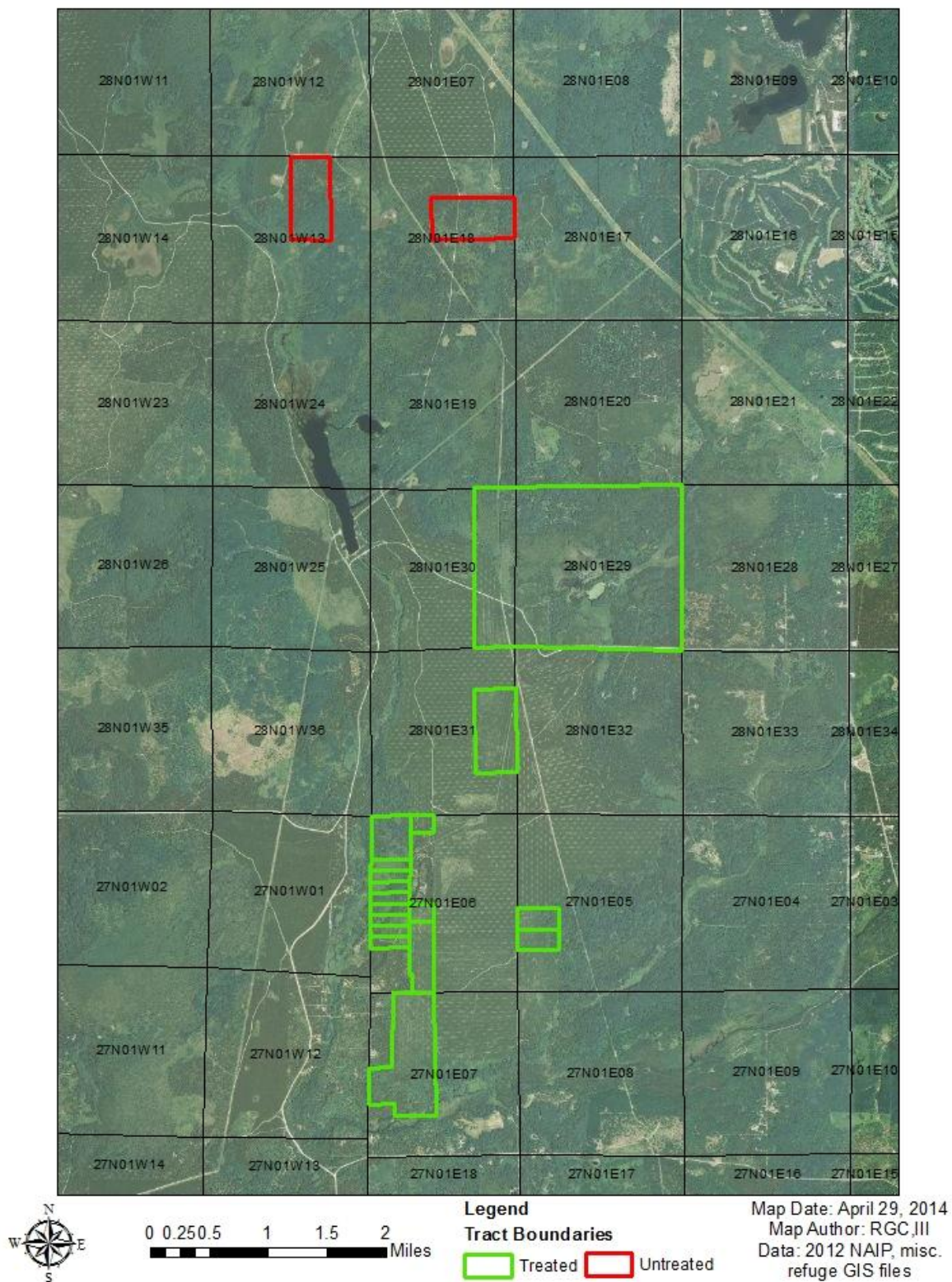
**Treated and Untreated Tracts: Kirtland's Warbler Wildlife Management Area
(Crawford Co. (north), MI, 2014)**
U.S. Fish and Wildlife Service



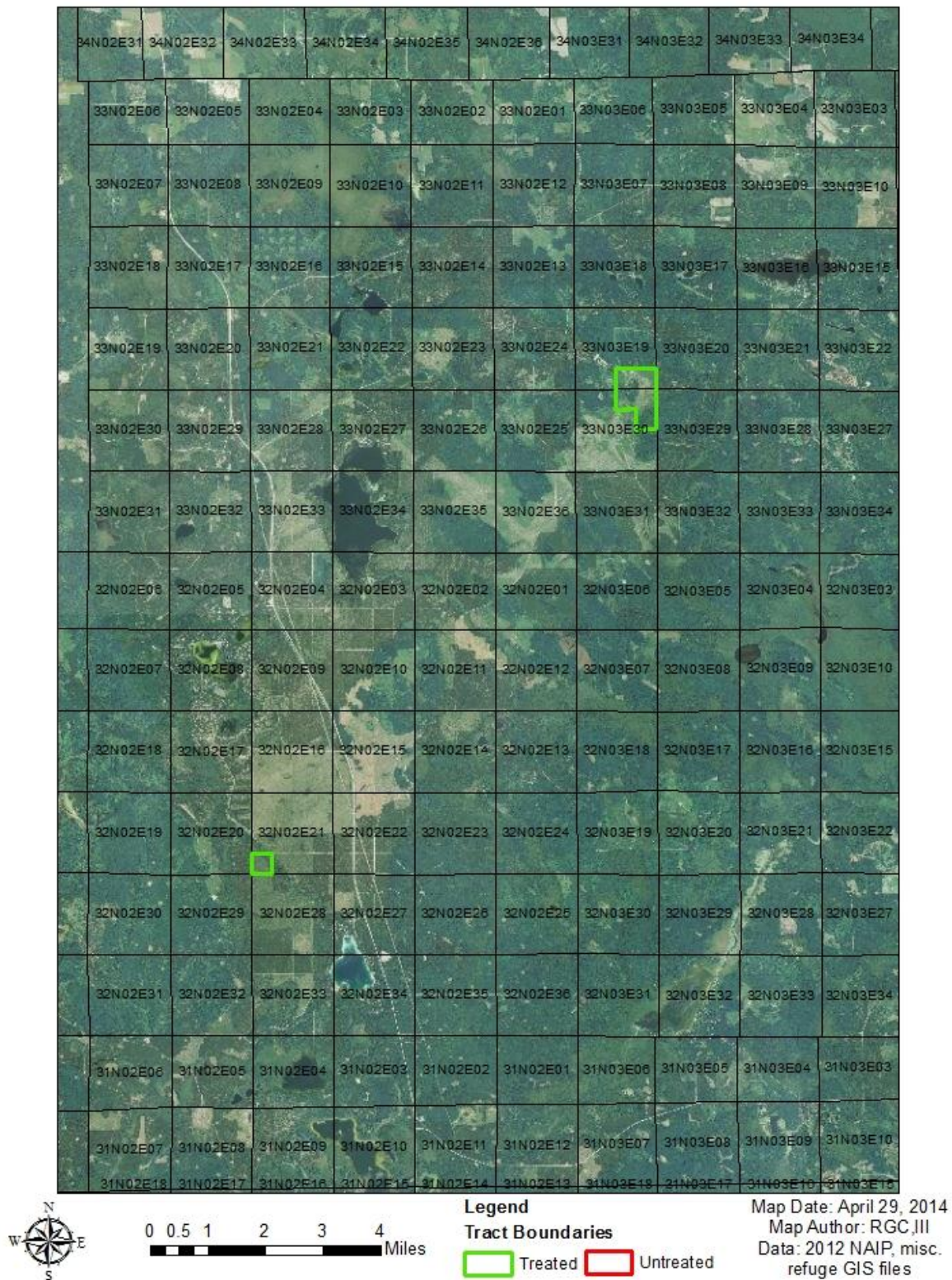
**Treated and Untreated Tracts: Kirtland's Warbler Wildlife Management Area
(Oscoda Co. (east), MI, 2014)**
U.S. Fish and Wildlife Service



Treated and Untreated Tracts: Kirtland's Warbler Wildlife Management Area
(Crawford Co. (north) and Oscoda Co. (north), MI, 2014)
 U.S. Fish and Wildlife Service



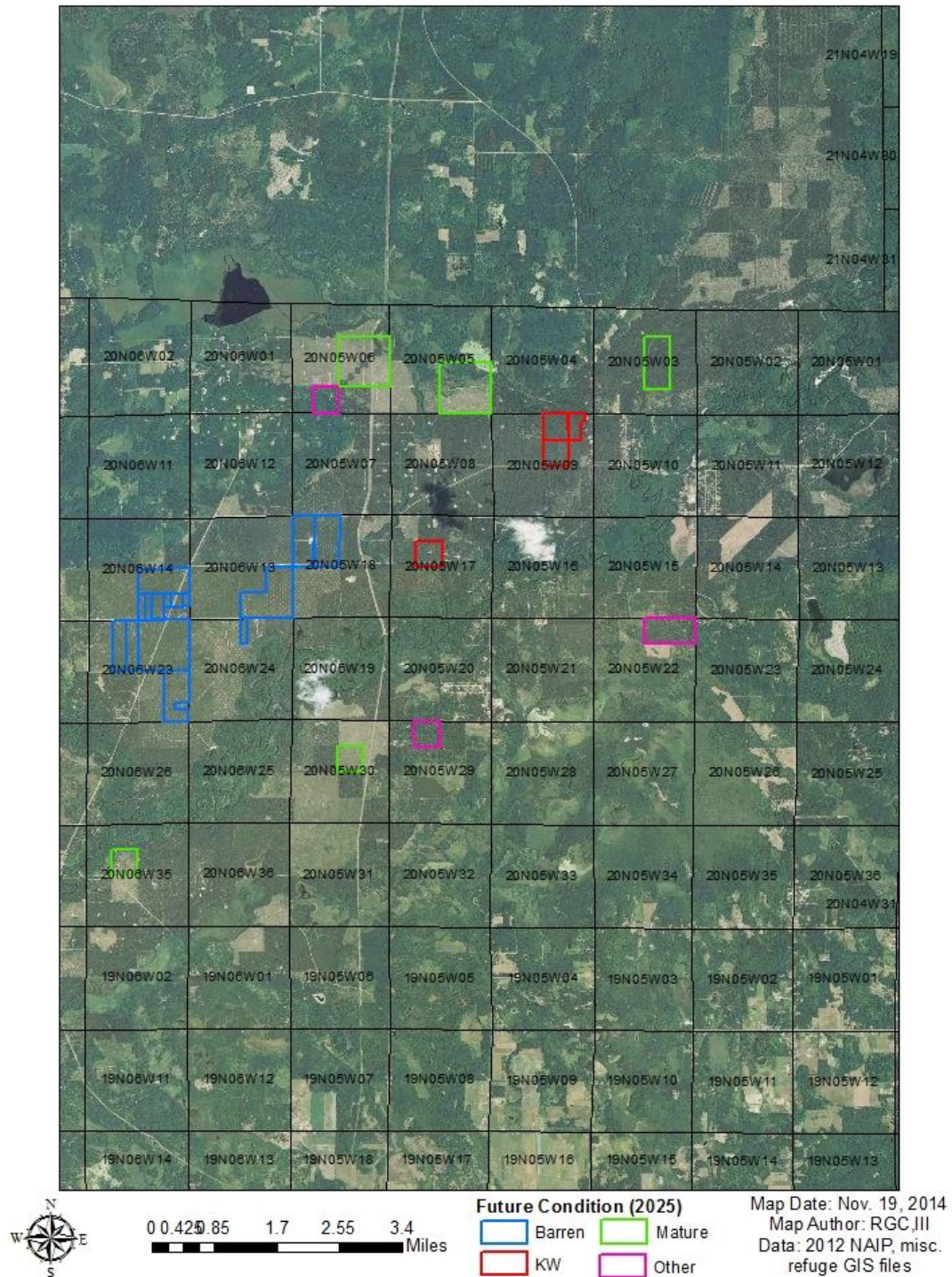
**Treated and Untreated Tracts: Kirtland's Warbler Wildlife Management Area
(Montmorency Co. and Presque Isle Co., MI, 2014)**
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Appendix 2. Maps of lands/tracts illustrating desired future conditions (2035) as proposed by Seney NWR staff. [Disregard map title with 2025.] Maps are listed in the same order as those shown above.

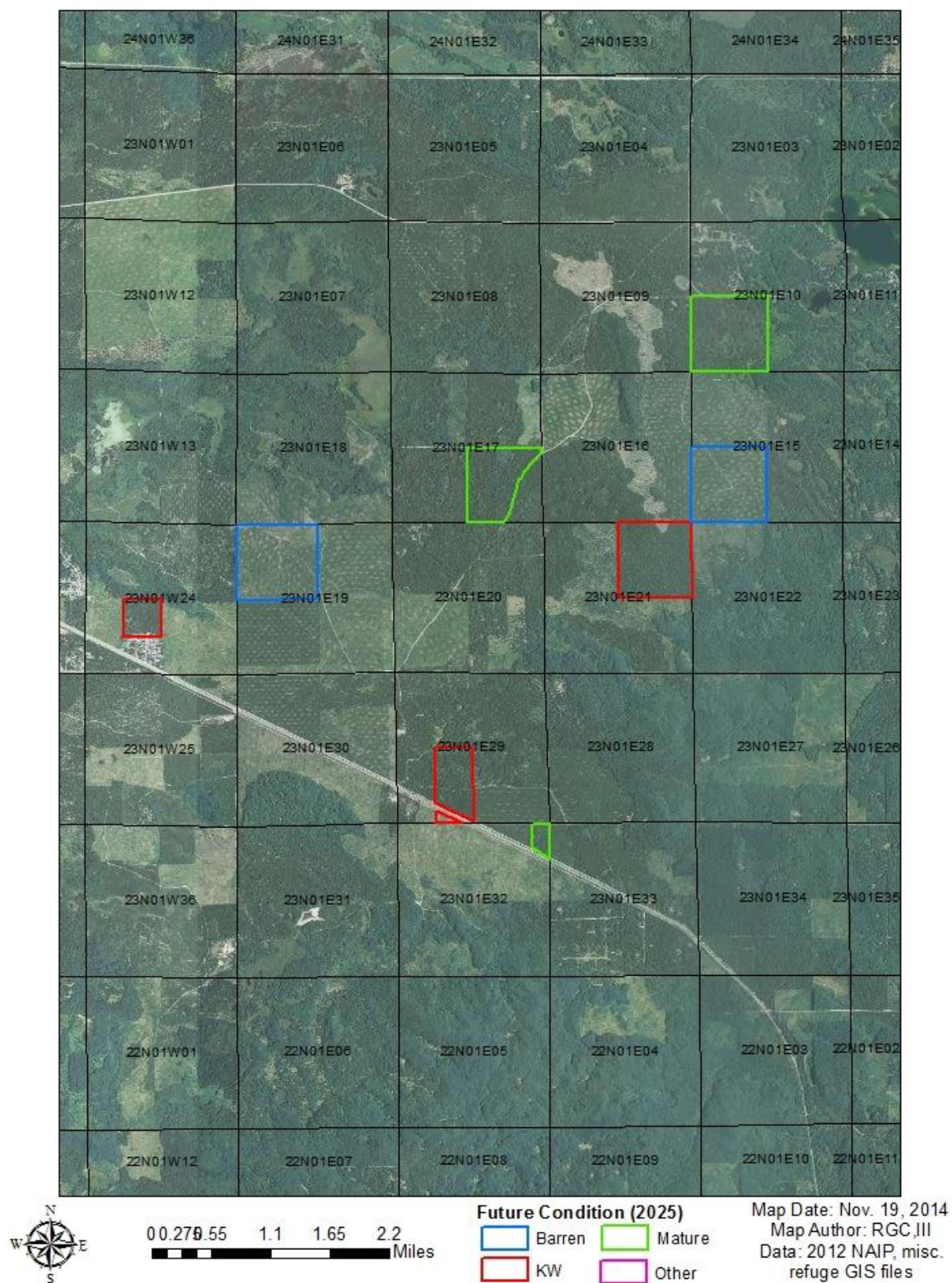
Projected Future Conditions: Kirtland's Warbler Wildlife Management Area (Clare Co., MI, 2025)

U.S. Fish and Wildlife Service

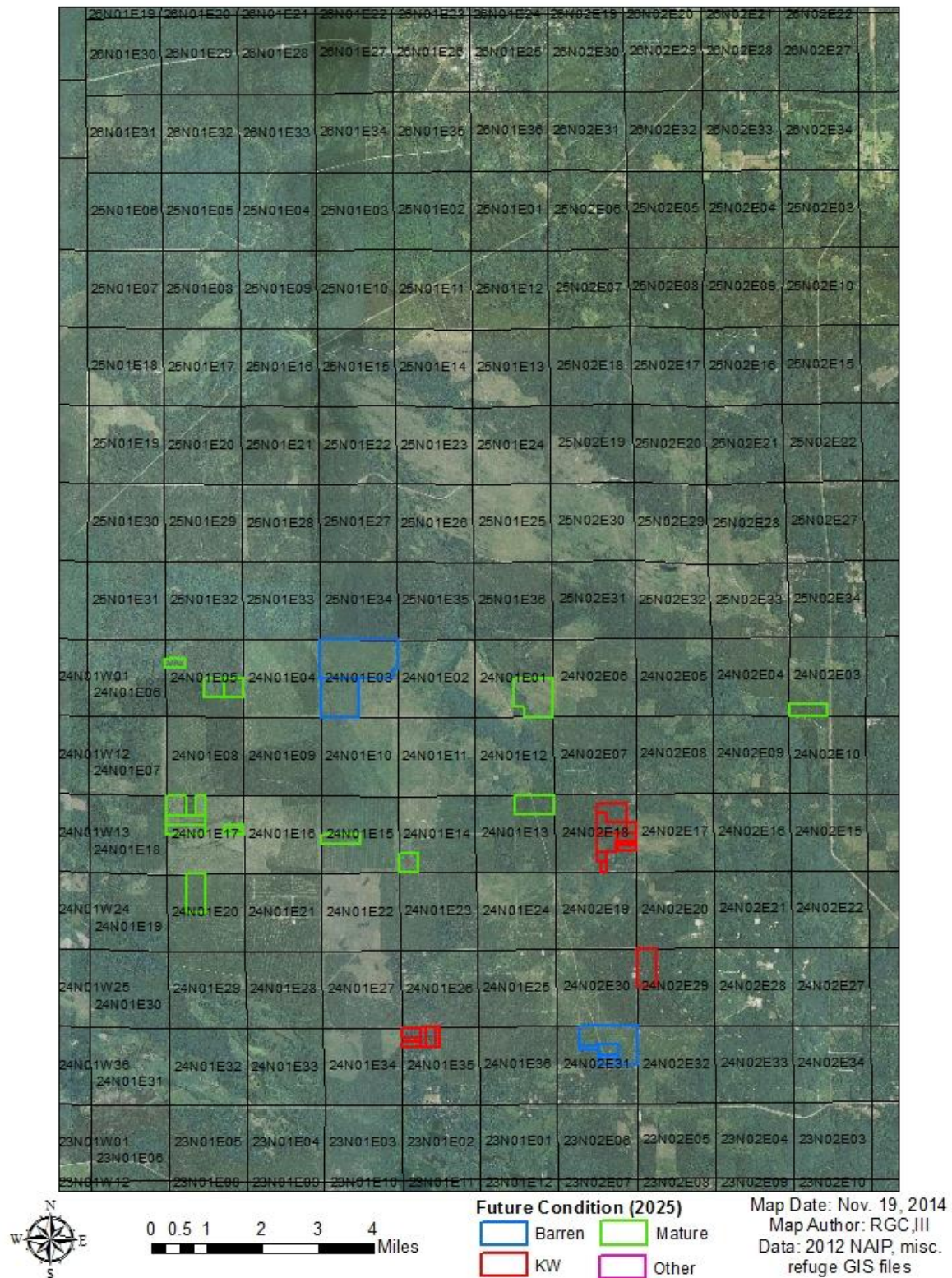


**Projected Future Conditions: Kirtland's Warbler Wildlife Management Area
(Roscommon Co. and Ogemaw Co. (south), MI, 2025)**

U.S. Fish and Wildlife Service



**Projected Future Conditions: Kirtland's Warbler Wildlife Management Area
(Ogemaw Co. (north), MI, 2025)**
U.S. Fish and Wildlife Service



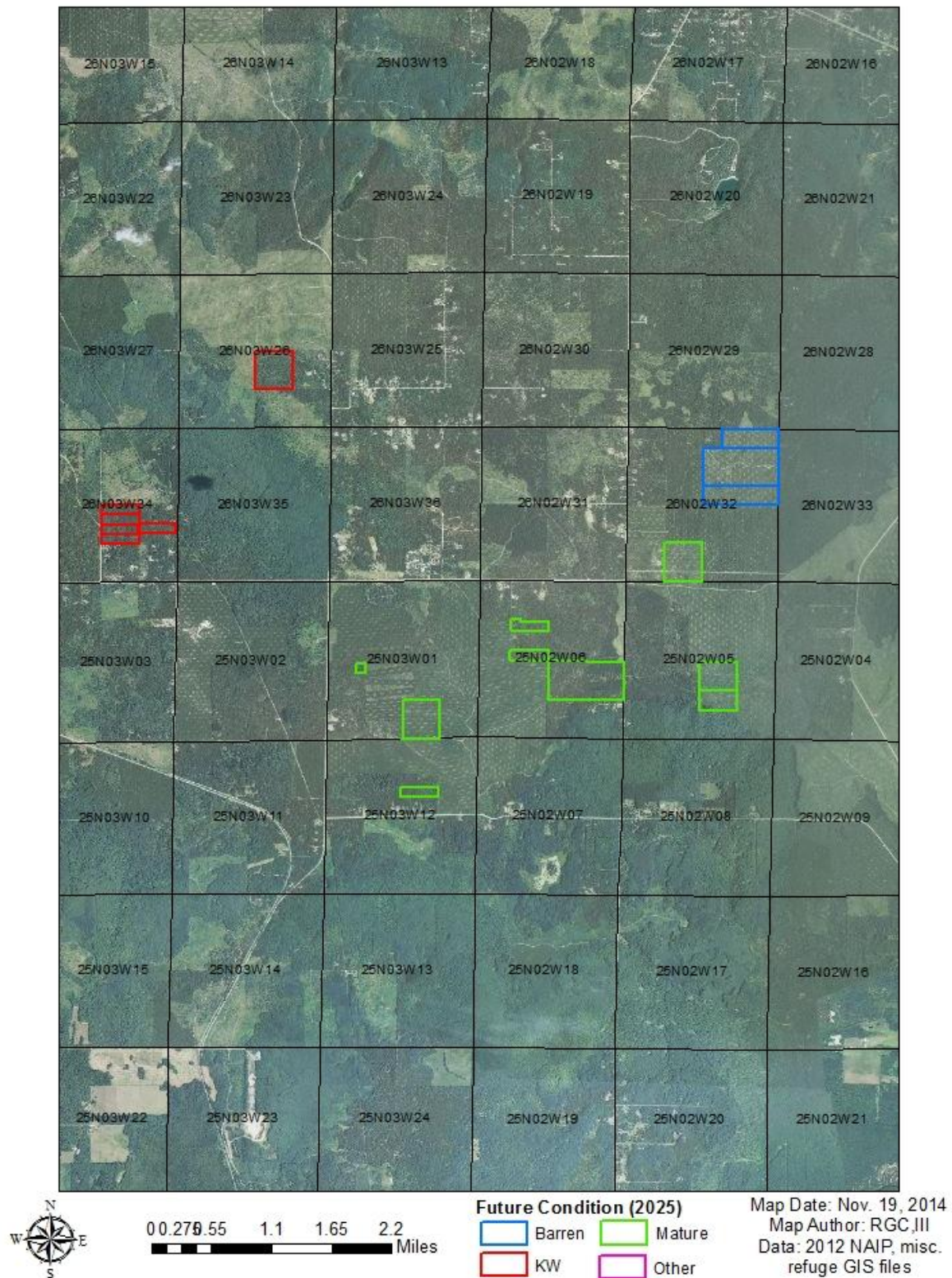
**Projected Future Conditions: Kirtland's Warbler Wildlife Management Area
(Kalkaska Co., MI, 2025)**
U.S. Fish and Wildlife Service



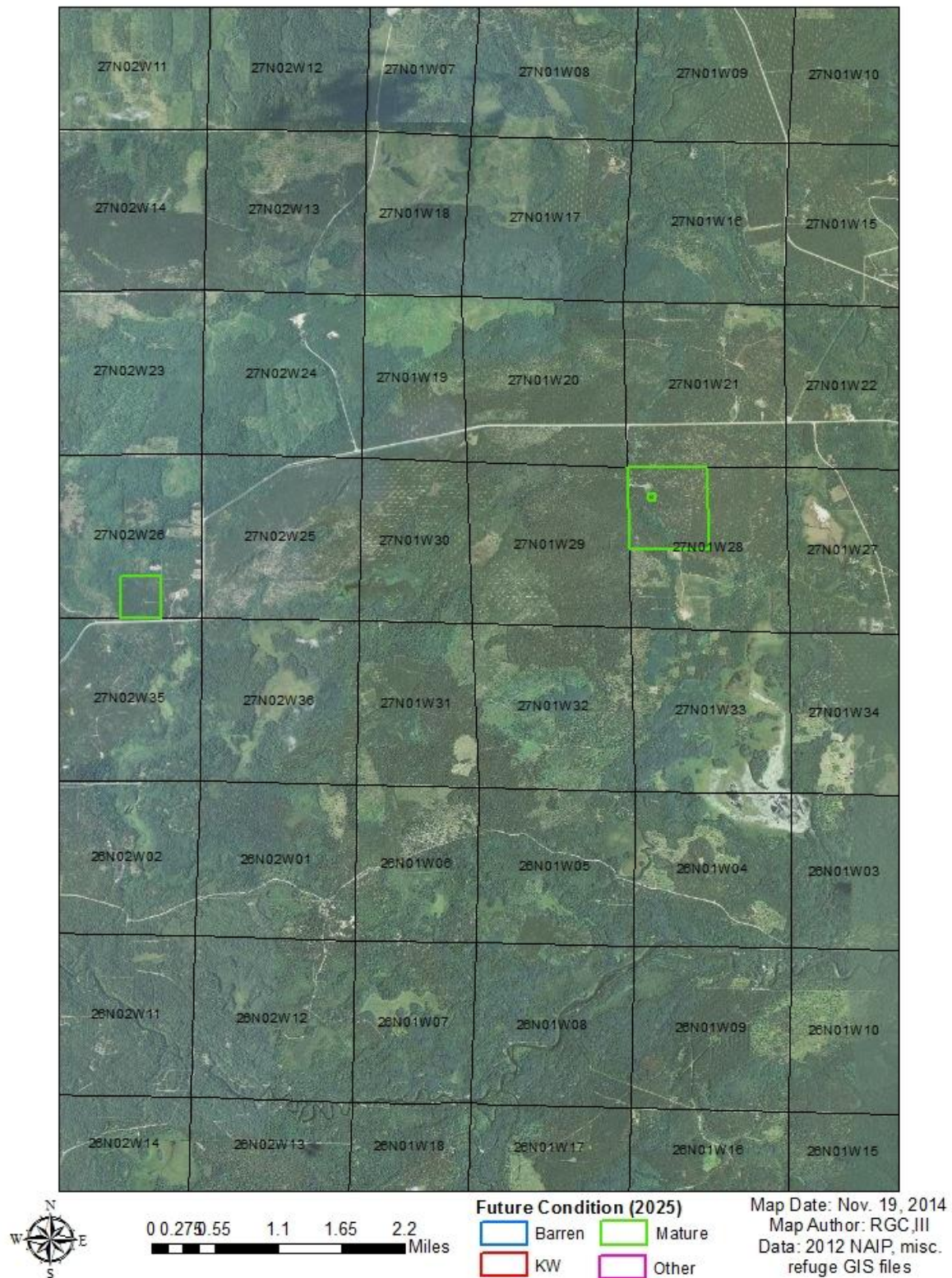
**Projected Future Conditions: Kirtland's Warbler Wildlife Management Area
(Crawford Co. (west), MI, 2025)**
U.S. Fish and Wildlife Service



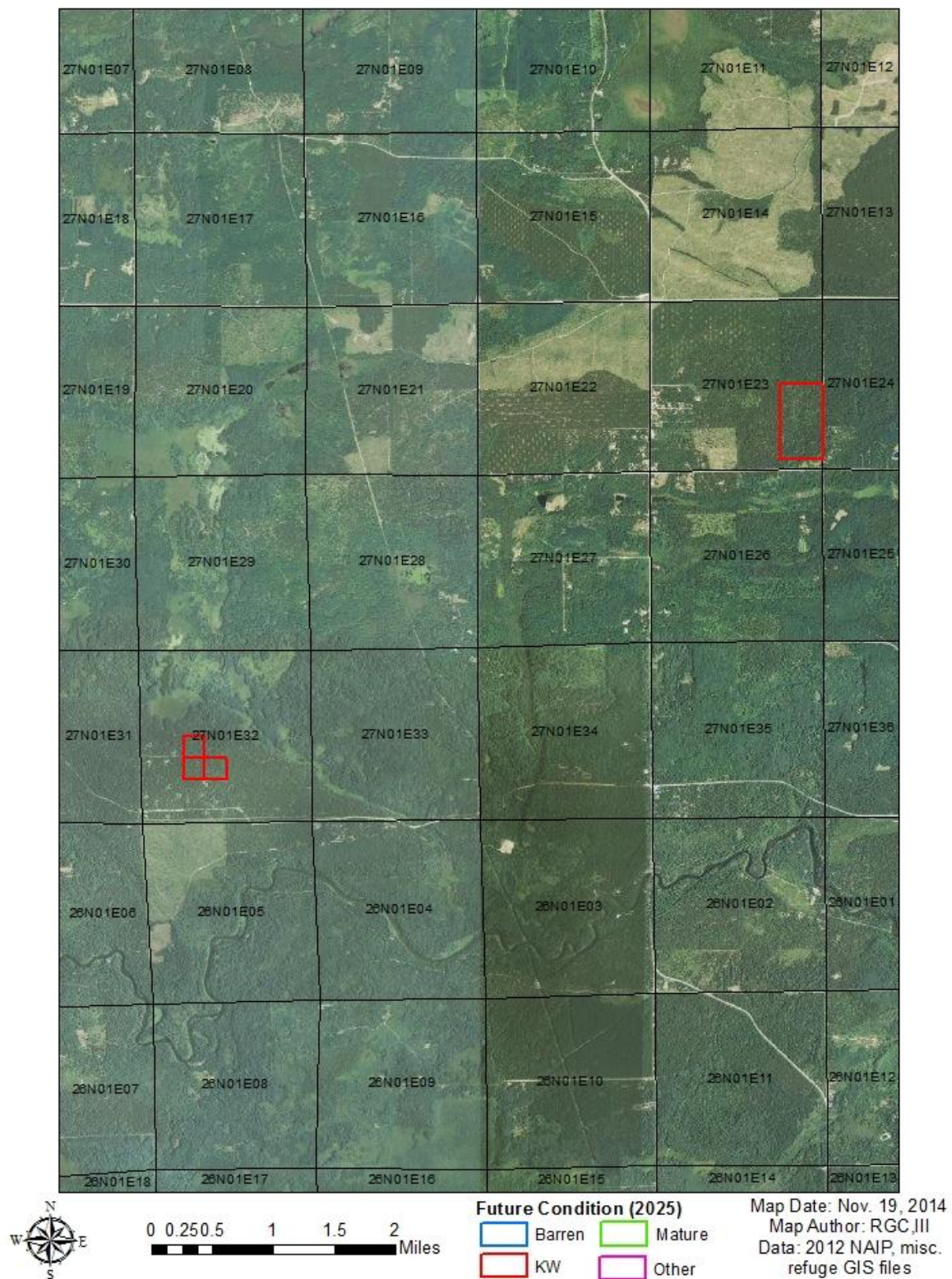
**Projected Future Conditions: Kirtland's Warbler Wildlife Management Area
(Crawford Co., MI, 2025)**
U.S. Fish and Wildlife Service



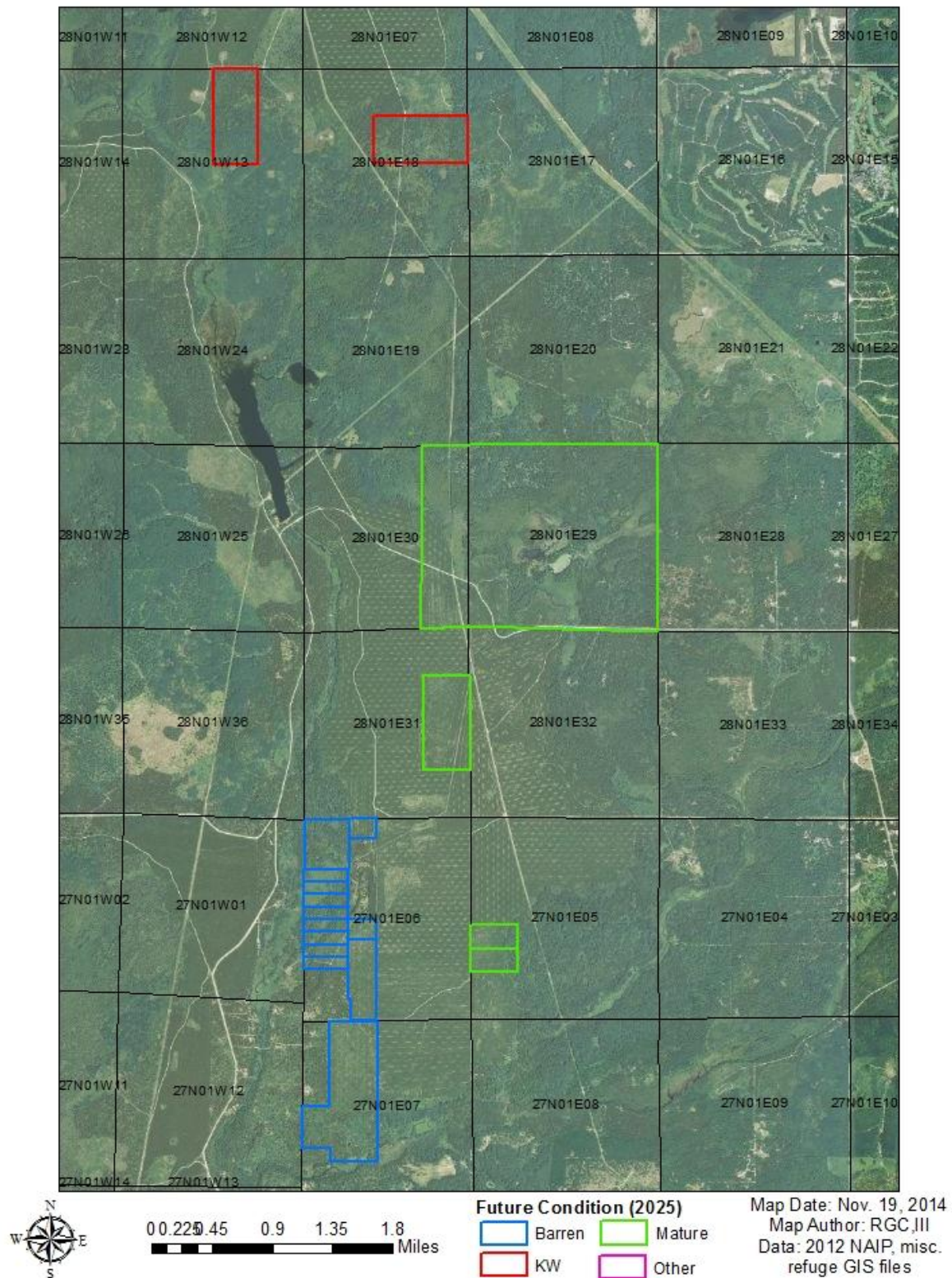
**Projected Future Conditions: Kirtland's Warbler Wildlife Management Area
(Crawford Co. (north), MI, 2025)**
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**Projected Future Conditions: Kirtland's Warbler Wildlife Management Area
(Oscoda Co. (east), MI, 2025)**
U.S. Fish and Wildlife Service

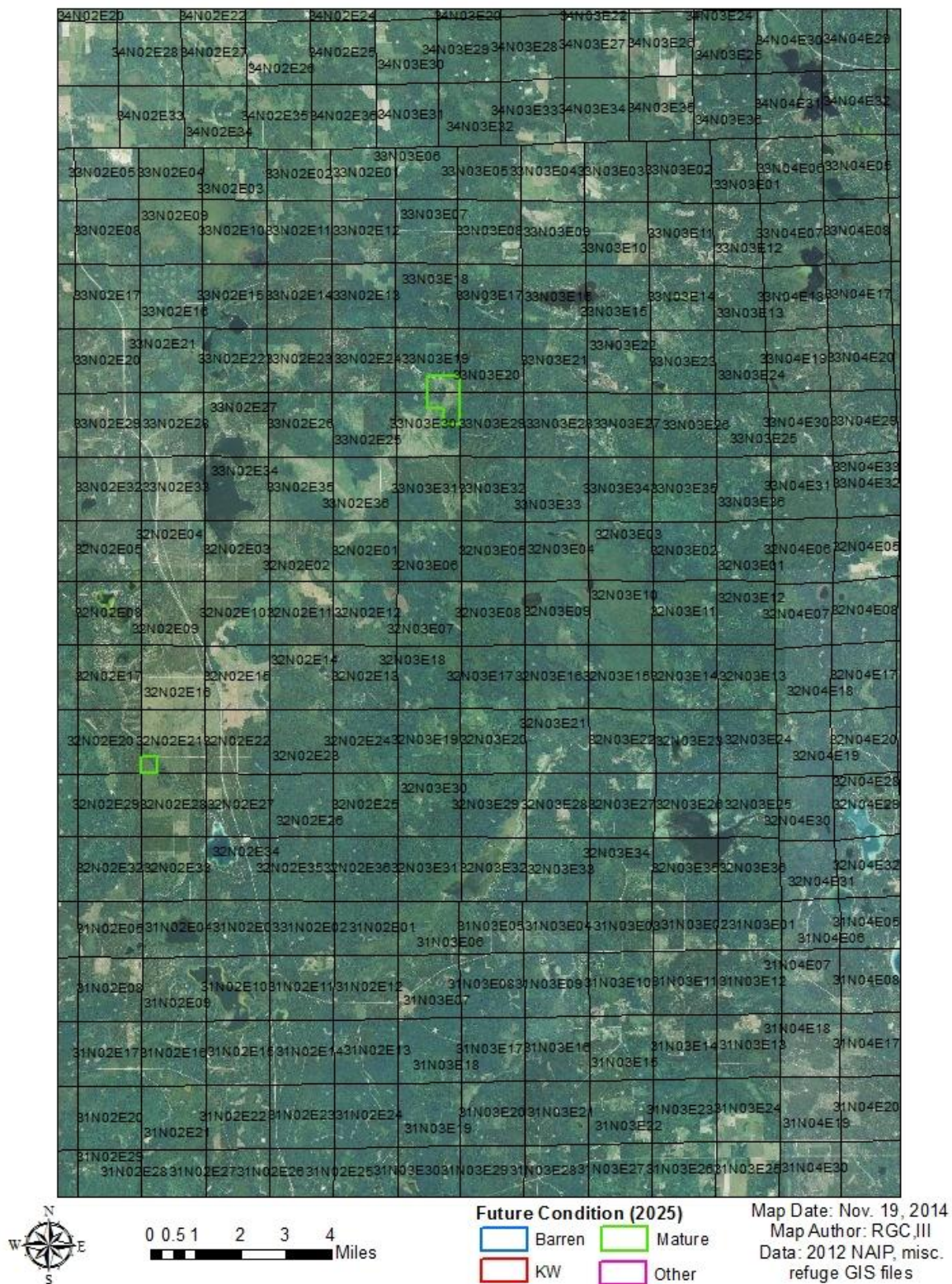


**Projected Future Conditions: Kirtland's Warbler Wildlife Management Area
(Crawford Co. (north) and Oscoda Co. (north), MI, 2025)**
U.S. Fish and Wildlife Service

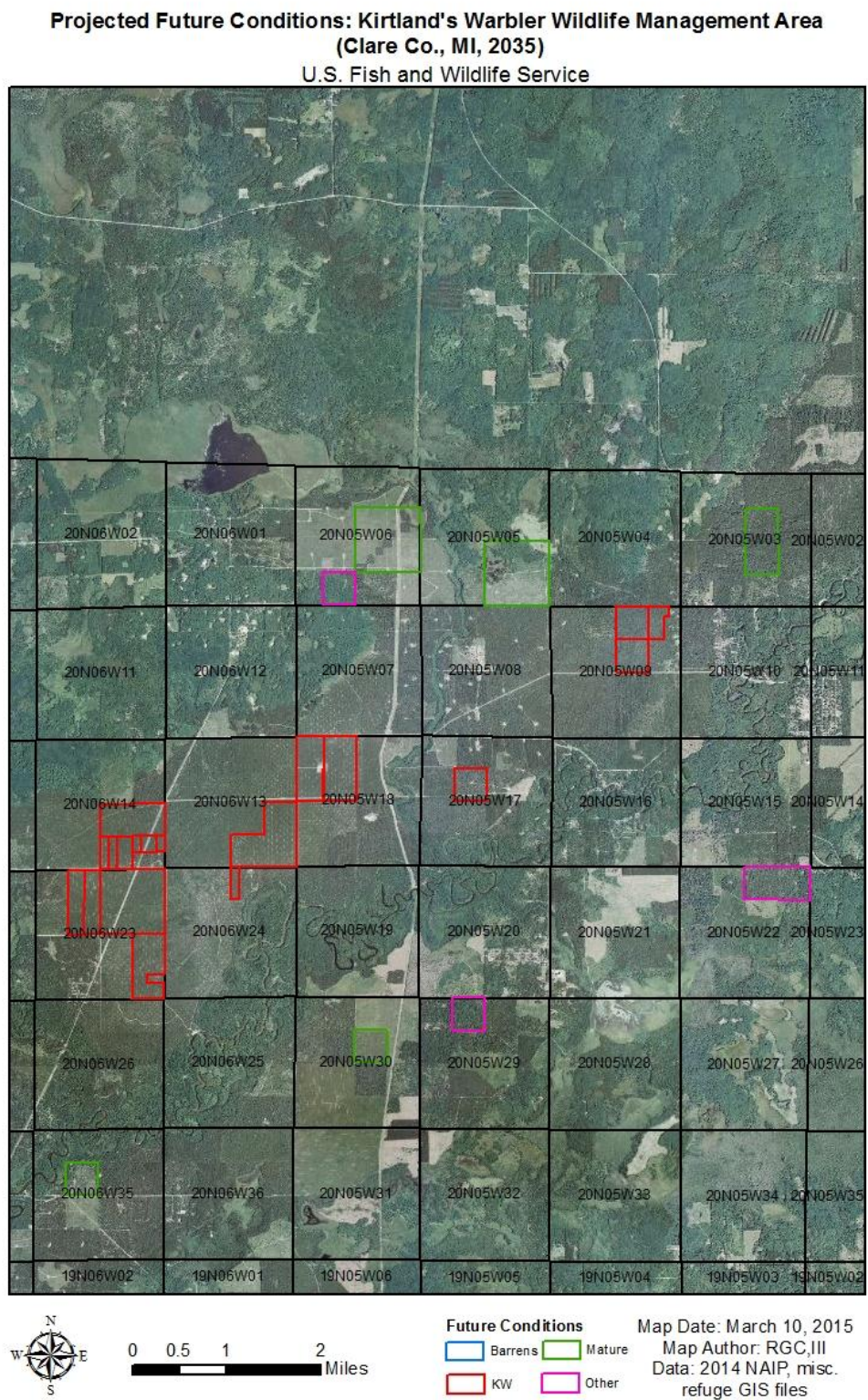


**Projected Future Conditions: Kirtland's Warbler Wildlife Management Area
(Montmorency Co. and Presque Isle Co., MI, 2025)**

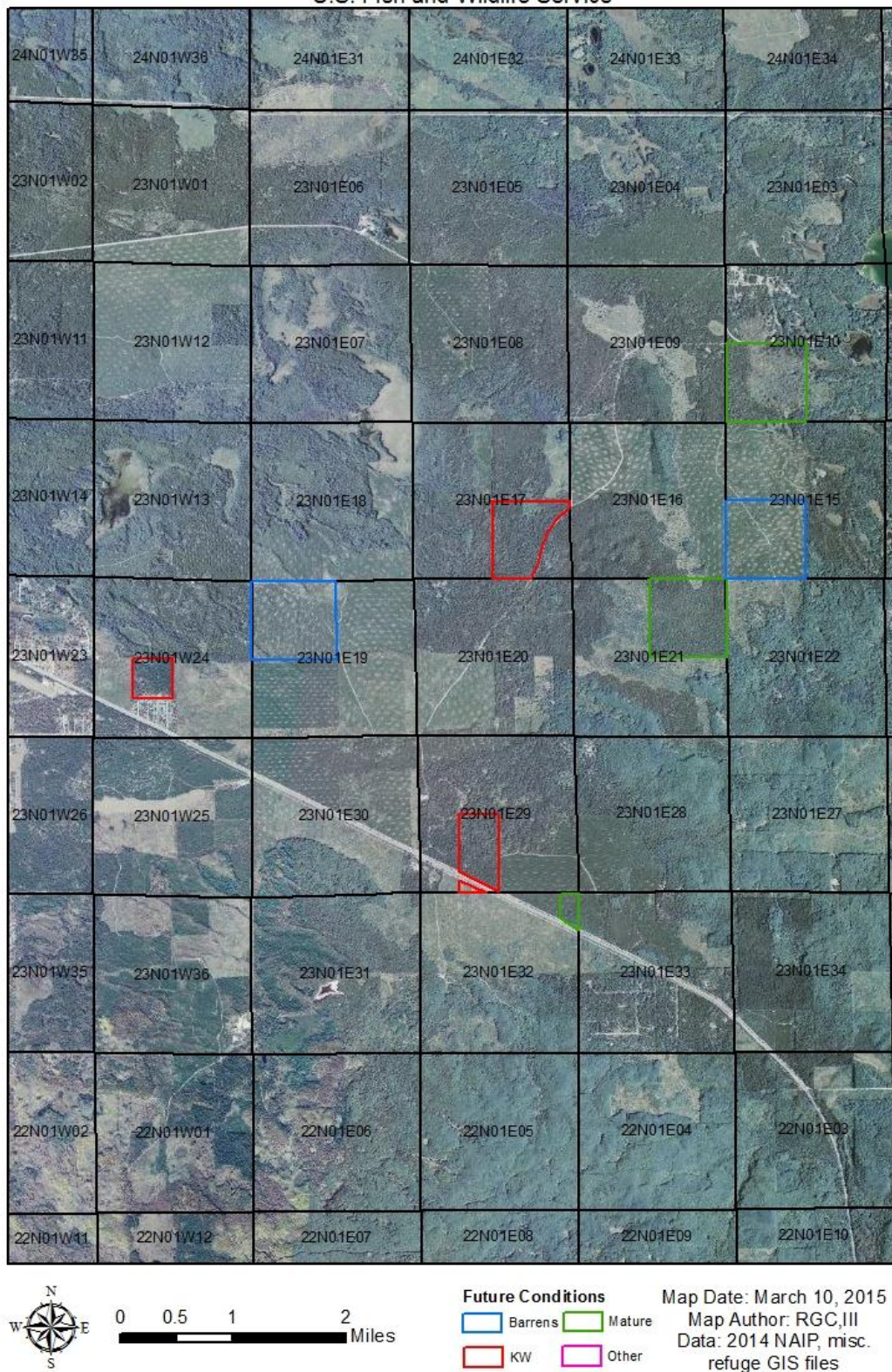
U.S. Fish and Wildlife Service



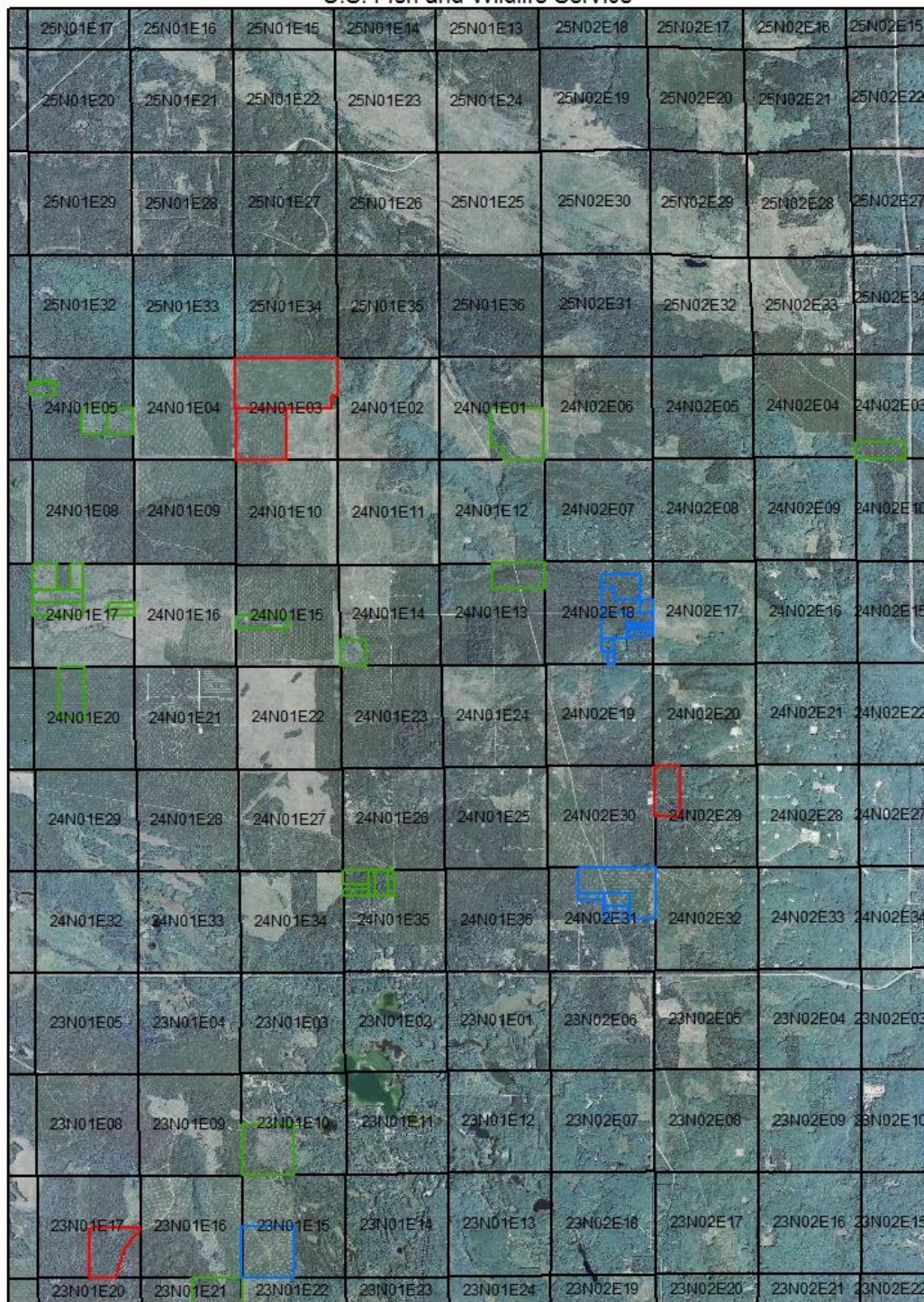
Appendix 3. Maps of lands/tracts illustrating desired future conditions (2035) as proposed by MDNR staff. Maps are listed in the same order as those shown above.



**Projected Future Conditions: Kirtland's Warbler Wildlife Management Area
(Roscommon and Ogemaw Co. (south), MI, 2035)**
U.S. Fish and Wildlife Service

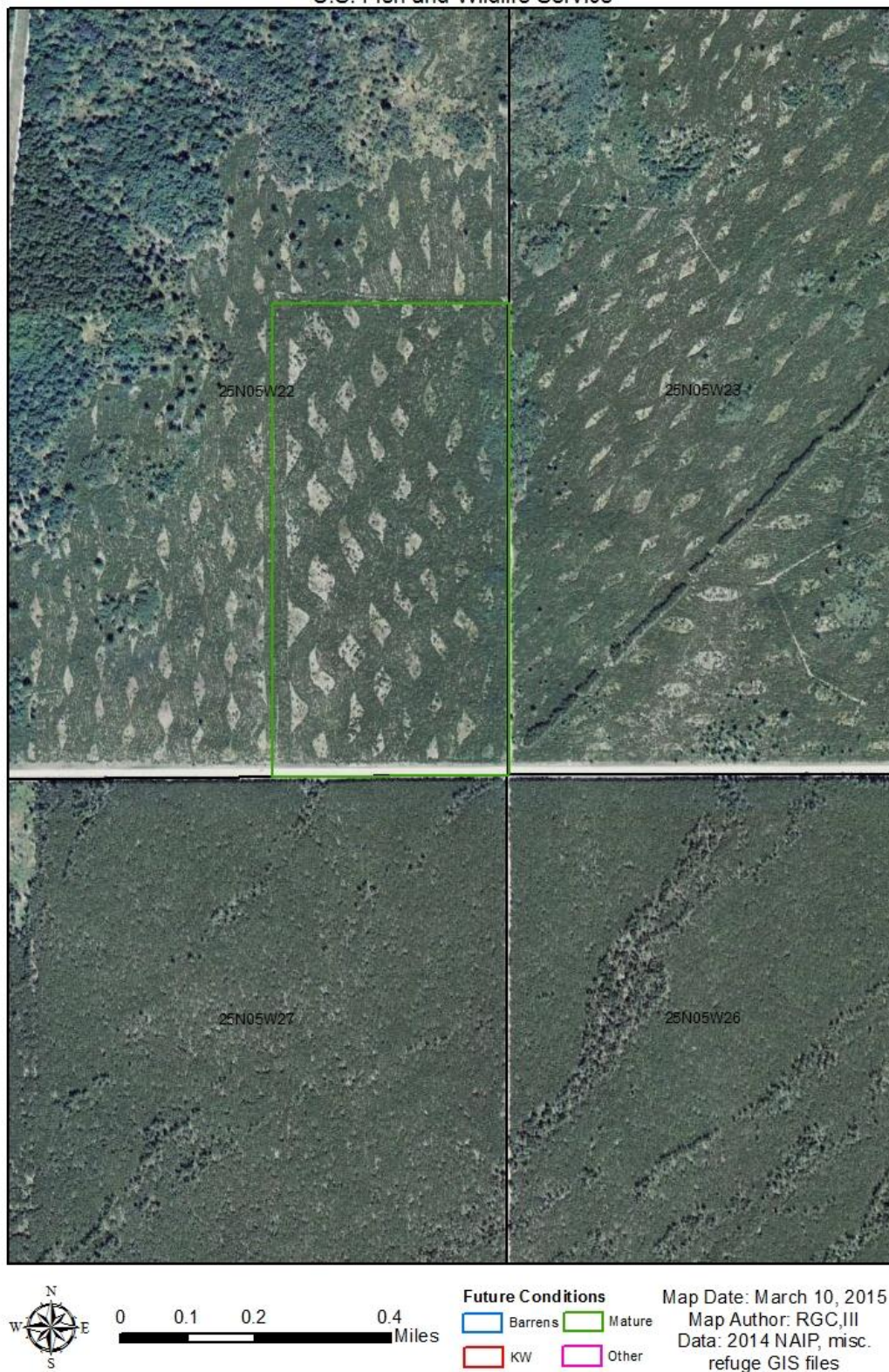


**Projected Future Conditions: Kirtland's Warbler Wildlife Management Area
(Ogemaw Co. (north), MI, 2035)**
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**Projected Future Conditions: Kirtland's Warbler Wildlife Management Area
(Kalkaska Co., MI, 2035)**

U.S. Fish and Wildlife Service

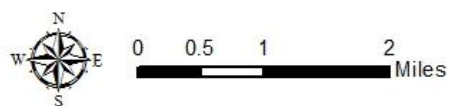


**Projected Future Conditions: Kirtland's Warbler Wildlife Management Area
(Crawford Co. (west), MI, 2035)**
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**Projected Future Conditions: Kirtland's Warbler Wildlife Management Area
(Crawford Co., MI, 2035)**

U.S. Fish and Wildlife Service



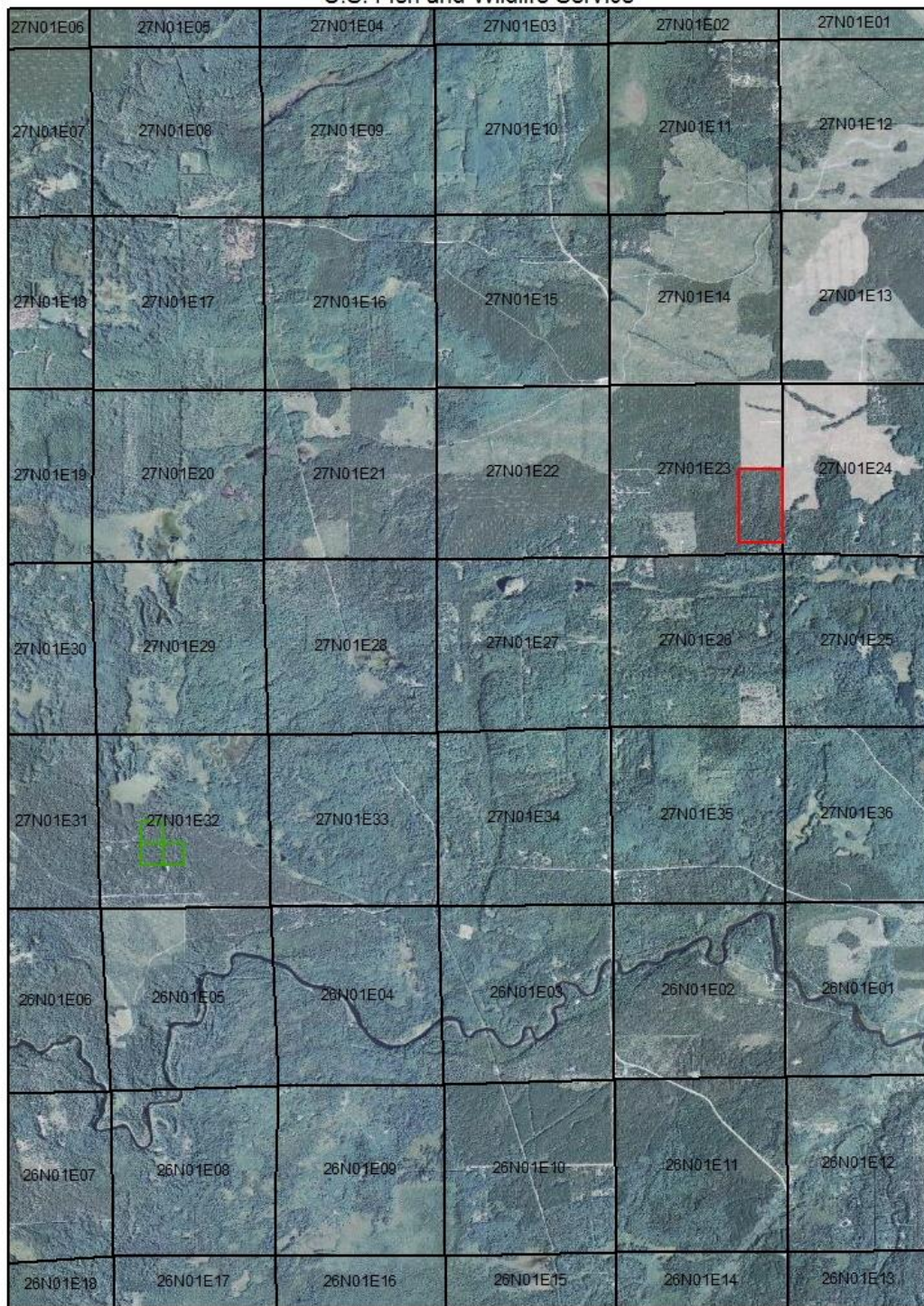
Future Conditions
 Barrens (light blue)
 Mature (green)
 KW (red outline)
 Other (pink)

Map Date: March 10, 2015
 Map Author: RGC, III
 Data: 2014 NAIP, misc.
 refuge GIS files

**Projected Future Conditions: Kirtland's Warbler Wildlife Management Area
(Crawford Co. (north), MI, 2035)**
U.S. Fish and Wildlife Service



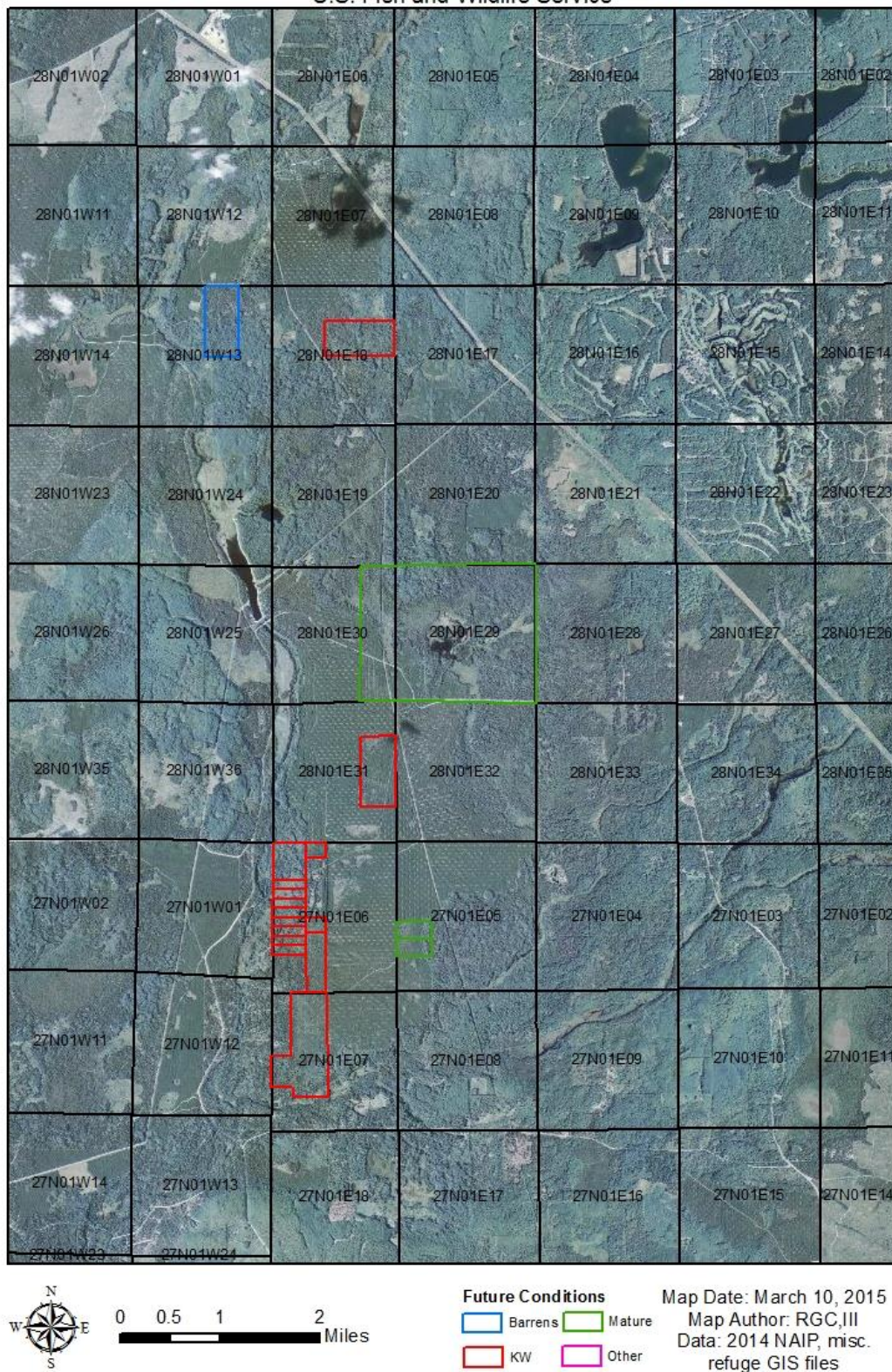
**Projected Future Conditions: Kirtland's Warbler Wildlife Management Area
(Oscoda Co. (east), MI, 2035)
U.S. Fish and Wildlife Service**



Future Conditions
 Barrens Mature
 KW Other

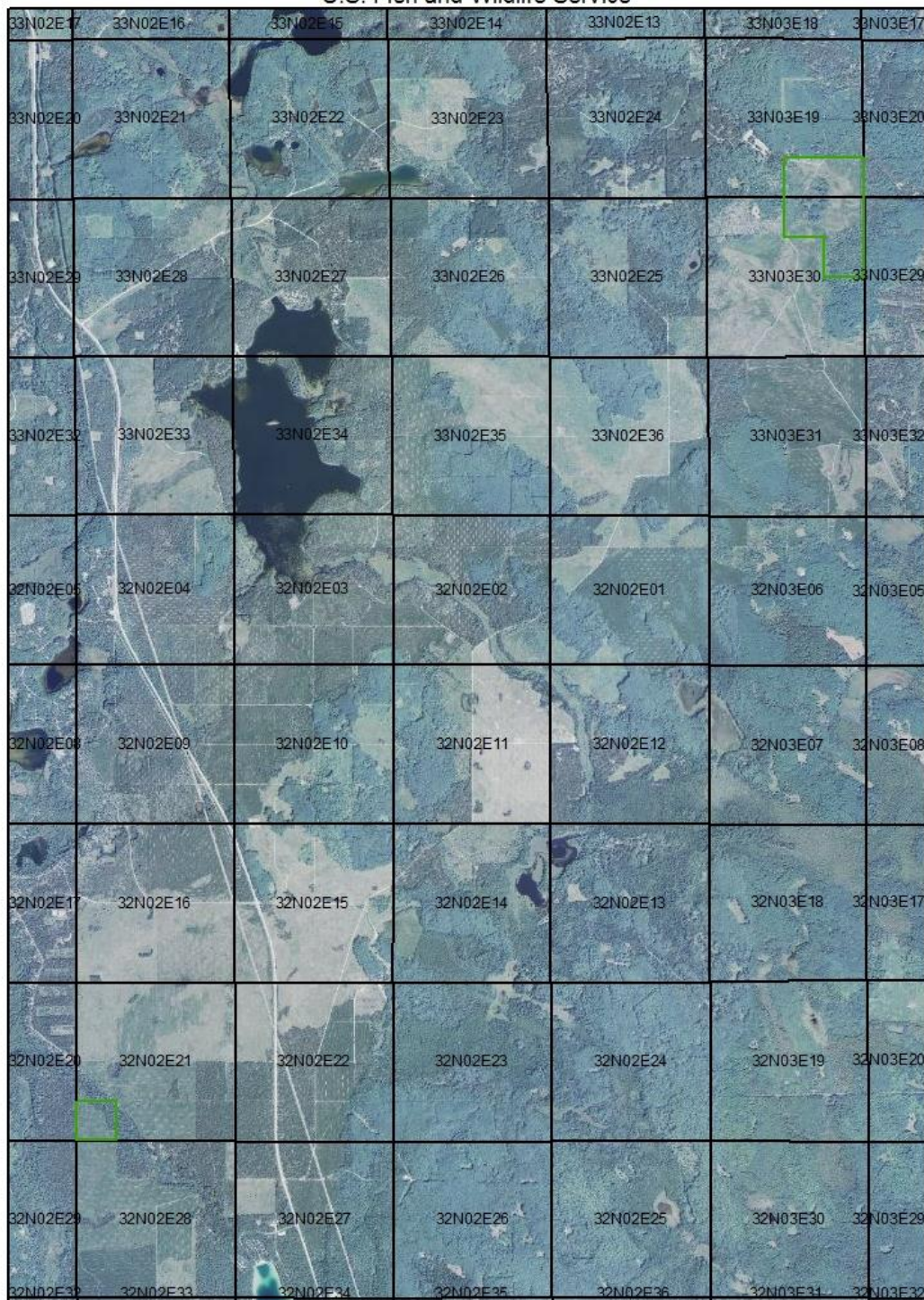
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 refuge GIS files

**Projected Future Conditions: Kirtland's Warbler Wildlife Management Area
(Crawford Co. (north) and Oscoda Co. (north), MI, 2035)
U.S. Fish and Wildlife Service**



**Projected Future Conditions: Kirtland's Warbler Wildlife Management Area
(Montmorency Co. and Presque Isle Co., MI, 2035)**

U.S. Fish and Wildlife Service



0 0.5 1 2 Miles

Future Conditions

- Barrens
- Mature
- KW
- Other

Map Date: March 10, 2015

Map Author: RGC, III

Data: 2014 NAIP, misc.
refuge GIS files