Michigan Technical Note

USDA-Natural Resources Conservation Service

BIOLOGY #12
Subject: Wildlife Habitat Evaluation
Date: April 2007

WILDLIFE HABITAT EVALUATION PROCEDURE

BACKGROUND

Wildlife habitat models are a valuable tool for assessing the landscape for wildlife. Generally two types of models have been developed, either models for a particular species or models for the land use being considered such as cropland, forestland, or pastureland.

Consideration of the effects of resource management decisions on the quality of wildlife habitat has been a part of the planning process of the Natural Resources Conservation Service (NRCS) since its beginning.

National quality criteria for the animal (wildlife) resource have been set at 50 percent of potential to meet the resource management system requirement, regardless of land use. National quality criteria for the animal (wildlife) resource have been set at 75 percent of potential to meet the resource management system requirement, when wildlife is the primary objective of the landowner. The potential of the resource system requirement for wildlife is identified by the attached Habitat Evaluation Procedure. In order to measure the degree to which the resource management system meets the quality criteria, a method of evaluation is required. A subjective evaluation based on the planner's knowledge is the easy form; however, this method is dependent on the interest, ability, and knowledge of the planner. Conservation planning certification by NRCS field personnel will require a basic understanding and the ability to employ a basic wildlife habitat evaluation procedure.

The attached Habitat Evaluation Procedure is designed for use when planning a resource management system where wildlife is not the primary objective and intensive management for a particular wildlife species is not desired. This evaluation procedure is based primarily on diversity to give a general rating applicable to many different wildlife species based on inferred benefits as a result of the application of agricultural conservation practices. The Habitat Suitability Index Models (HSI) have been developed for when managing for a particular species is the landowner's objective. These models are available at: http://www.nwrc.usgs.gov/wdb/pub/hsi/hsiindex.htm.

This procedure may continue to be used when wildlife land is the primary land use (wildlife planning is a primary landowner objective), but intensive wildlife planning will often require a more detailed habitat assessment addressing a particular species and specific habitat needs.

This Habitat Evaluation Procedure is NOT to replace program-specific evaluations used in ranking, where such program specific evaluations have been developed (e.g., Wildlife Habitat Incentives Program).

INTRODUCTION

The following evaluation is designed for use by employees who provide assistance in farm planning and have limited training and knowledge in wildlife management principles. It is based on a numerical scale from 0 to 1. It is intended to assist decision-makers in understanding the effects of various agricultural practices on wildlife and to provide documentation of the effects of Resource Management System implementation on wildlife resources. This evaluation is primarily "conservation practice oriented," and may not properly indicate the true quality of the habitat for a targeted wildlife species without considering additional criteria such as specific habitat needs for that species, life cycles, population dynamics, etc.

This habitat evaluation is simplified to limit data input and the time required to complete it. It is not designed to make detailed management recommendations required for intensive wildlife management. If the primary objective for a conservation treatment unit is wildlife, or it is to be intensively managed for wildlife, a species-based wildlife habitat appraisal procedure should be used.

PROCEDURE

(1) Determine the planned Conservation Treatment Unit (CTU). For this evaluation, the planned CTU may be an individual field, group of fields, tract, or whole farm. The CTU is determined jointly by the decision-maker and the planner.

(2) Identify habitat types within the planned CTU according to the following categories: (a) cropland; (b) woodland; (c) pastureland/hayland; (d) grassland; (e) wetland; and (f) shrubland. Recognize and consider the land cover types making up the borders of the CTU. Wildlife habitat benefits extend beyond property lines. If a particular type of land use does not seem to fit any of those listed, contact the NRCS State Biologist.

(3) If the CTU has only one field in a habitat type, or all fields within a habitat type are similar, only one field needs to be evaluated. If the conservation treatment unit has fields that vary in habitat quality within a habitat type, fields may be grouped with multiple inventories and a weighted average score computed. If there are significant differences in the same field, it may be divided and more than one evaluation done. For example, if the CTU is forested with a clearly defined area as strictly a hardwood forest and another clearly defined area as a pine plantation, the two areas should be evaluated separately. If more than one of these variations occurs within the CTU, use the weighted average score for the land use.

(4) Complete the Worksheet Inventory form(s), as appropriate, for the CTU (see attachments) and compute the score for each habitat type. This evaluation will provide information on the quality of the habitat for the EXISTING CONDITION. Noting those features that receive a low score will help the planner select alternative practices or treatments that could improve the habitat. For example, the index for a large cropland field could be improved by adding hedgerows or field windbreaks to reduce the field size. The index rating for a woodlot may be improved by planting understory shrubs or creating snag and den trees.

(5) Repeat the evaluation for each of the Resource Management System PLANNED ALTERNATIVES being considered to determine anticipated effects on the wildlife (animal) resource.

(6) Complete the summary sheet to determine: (a) the composite or weighted score for all land uses within the conservation treatment unit; and (b) if the selected alternative meets the quality criteria for a Resource Management System and is acceptable to the decision-maker.

QUALITY CRITERIA

In order to meet the Field Office Technical Guide (FOTG) Quality Criteria for the wildlife (animal) resource, the composite Habitat Type Index for the conservation treatment unit must have an index greater than 0.5, where wildlife land is not the primary land use. The index is calculated by dividing the site-specific score by the potential maximum resource score. Where wildlife land is the primary land use, the habitat index must be greater than 0.75 to meet the Quality Criteria. In general, a habitat index below 0.3 indicates poor habitat, between 0.3 and 0.49 indicates fair habitat, between 0.5 and 0.75 is good habitat, and above 0.75 would be considered excellent habitat.

MICHIGAN HABITAT INDEX WORKSHEET

CROPLAND[1]

Participant _____ Tract No. _____ Date _____ Field No. _____

Observer _____ Acres _____

CROPLAND HABITAT INDEX	POINTS	EXISTING	PLANNED
1. Average Field Size[2] - Separated by hedgerows or field borders (minimum 25 feet wide)			
< 10 acres	10	_____	_____
10-40 acres	7	_____	_____
40.1-60 acres	3	_____	_____
60.1-80 acres	1	_____	_____
> 80.1 acres	0	_____	_____
2. Crop Rotation			
Row crop-small grain-grass/legume	10	_____	_____
Row crop-small grain	6	_____	_____
Continuous row crop	0	_____	_____
3. Crop Residue Management			
No fall tillage, residue undisturbed	10	_____	_____
> 50% residue after fall tillage	7	_____	_____
10-50% residue after fall tillage	3	_____	_____
Fall moldboard plowing	0	_____	_____
4. Crop Management			
> 5% unharvested or equivalent food plots present	10	_____	_____
3-5% unharvested or equivalent food plots present	7	_____	_____
1-2% unharvested or equivalent food plots present	4	_____	_____
Total crop harvest, weeds present	3	_____	_____
Total crop harvest, clean field in winter	0	_____	_____

CROPLAND HABITAT INDEX	POINTS	EXISTING	PLANNED
5. Distance to Undisturbed Cover or Woodland[3]			
> 75% of cropland within 330 feet of cover	10	_____	_____
25-75% of cropland within 330 feet of cover	5	_____	_____
10-25 % of cropland within 330 feet of cover	2	_____	_____
< 10% of cropland within 330 feet of cover	0	_____	_____
6. Average Width of the Field - Separated by hedgerows or field borders (minimum 25 feet wide)			
< 670 feet	10	_____	_____
< 1,340 feet	5	_____	_____
> 1,340 feet	0	_____	_____
(A) TOTAL CROPLAND HABITAT POINTS (60 MAX.)		_____	_____
(B) CROPLAND HABITAT INDEX (A/60)		_____	_____

1. Includes row crop, small grain, orchards, vegetables, or grass as part of rotation.
2. Field size impacts distance to cover. Similar fields separated only by field roads or clean fencerows should be combined for evaluation.
3. Concealment cover must be at least 25 feet wide and greater than 10,000 square feet in size.

MICHIGAN HABITAT INDEX WORKSHEET

WOODLAND[1]

Participant _____ Tract No. _____ Date _____ Field No. _____

Observer _____ Acres _____

WOODLAND HABITAT INDEX	POINTS	EXISTING	PLANNED
1. Grazing			
Ungrazed	8	_____	_____
Grazed within last 3 years	5	_____	_____
Currently grazed	0	_____	_____
2. Plant Community Diversity[2]			
5 tree species common[3] and >2 age classes[4]	10	_____	_____
3-4 tree species common and >2 age classes	7	_____	_____
3-4 tree species common 1-2 age classes	5	_____	_____
2 tree species common	3	_____	_____
1 tree species common, only 1 age class	0	_____	_____
3. Mast Producing Tree Species Present		_____	_____
Estimate % canopy of hard mast (oak, hickory) and soft mast (maple, elm, ash) trees present. Assign 1 point for each % hard mast and 0.5 for each % soft mast cover with a maximum of 40 points.			
4. Forest Size and Configuration			
Contiguous >50 acres with corridor	10	_____	_____
Contiguous>50 acres	8	_____	_____
Contiguous 25-50 acres with corridor	6	_____	_____
Contiguous 25-50 acres	4	_____	_____
Woodland < 25 acres; corridor connected	2	_____	_____
Woodland < 25 acres; isolated	0	_____	_____

WOODLAND HABITAT INDEX	POINTS	EXISTING	PLANNED
5. Snags and Cavity Trees[5]			
At least 3 snags and cavity trees per acre	8	_____	_____
2 snag and cavity trees per acre	6	_____	_____
1 snag and cavity tree per acre	2	_____	_____
0 snag or cavity trees per acre	0	_____	_____
6. Shrub and Herbaceous Cover > 2 feet tall			
> 50% canopy cover	5	_____	_____
25-50% canopy cover	10	_____	_____
10-24% canopy cover	5	_____	_____
5-9% canopy cover	2	_____	_____
< 5% cover	0	_____	_____
7. Presence of Invasive Species - Percent of the woodland with invasive plants			
0-5%	10	_____	_____
6-10%	7	_____	_____
11-15%	4	_____	_____
> 15%	0	_____	_____
8. Percent of Conifers (Applies only to northern LP and UP)			
> 75%	4	_____	_____
60-75%	6	_____	_____
35-59%	10	_____	_____
15-34%	6	_____	_____
< 15%	0	_____	_____
(A) TOTAL WOODLAND HABITAT POINTS (96 - 106)		_____	_____
(B) WOODLAND HABITAT INDEX (A/96 or 106)		_____	_____

1. Different woodland types may need to be evaluated separately (e.g., pine forest, upland hardwood forest, lowland hardwood). Woodlots are greater than 1 acre in size and have a tree canopy cover of greater than 30%.
2. Diversity of tree species supports more wildlife species.
3. Common is defined as comprising at least 10% of the stand.
4. Age classes are recognized as being seedling, sapling, pole and mature or saw timber >10% of stand.
5. Snags are standing dead trees or limbs > 4 inches in diameter. Cavity trees are greater than 10 inches in diameter with existing cavities.

MICHIGAN HABITAT INDEX WORKSHEET

PASTURELAND/HAYLAND[1]

Participant _____ Tract No. _____ Date _____ Field No. _____

Observer _____ Acres _____

PASTURELAND/HAYLAND HABITAT INDEX	POINTS	EXISTING	PLANNED
1. Species Composition (Diversity) 2 points for each common[2] grass species up to 6 points and 2 points for each common legume species up to 6 points with a maximum total of 12 points.		_____	_____
2a. Hayland Management Add points for each management practice up to a maximum of 10 points.		_____	_____
> 10% uncut refuge area from 4/1 to 9/1	10		
> 10% uncut refuge area from 6/1 to 8/1	4		
Mowing during daytime from inside out or adjacent passes	2		
2 or less harvests per year	2		
Mower uses a flushing bar	2		
2b. Pasture Management			
Follow wildlife friendly grazing plan[4]	10	_____	_____
Rotational grazed	4	_____	_____
Other	0	_____	_____
3. Distance to Concealment Cover[3]			
> 75% of area within 330 feet of cover	10	_____	_____
25-75 % of area within 330 feet of cover	5	_____	_____
< 25% of area within 330 feet of cover	1	_____	_____

PASTURELAND/HAYLAND HABITAT INDEX	POINTS	EXISTING	PLANNED
4. Undesirable Vegetation			
Less than 10% of the area covered by undesirable plant species for wildlife (tall fescue, smooth brome, common reed, reed canary grass, or noxious weeds).	10	_____	_____
Less than or equal to 20% of the area covered by undesirable plant species for wildlife (tall fescue, smooth brome, common reed, reedcanary grass, or noxious weeds).	5	_____	_____
Greater than 20% of the area covered by undesirable plant species for wildlife (tall fescue, smooth brome, common reed, reed canary grass, or noxious weeds).	0	_____	_____
(A) TOTAL HABITAT POINTS (42 MAX.)		_____	_____
(B) PASTURELAND/HAYLAND HABITAT INDEX (A/42)		_____	_____

1. This worksheet should be used for herbaceous areas that are mowed, grazed, or managed for nonwoody vegetation primarily for livestock production, hay production, or non-wildlife purposes.
2. Common is defined as comprising at least 10% of the stand.
3. Concealment cover must be at least 25 feet wide and greater than 10,000 square feet in size.
4. Wildlife friendly grazing plan includes: rotational grazing system with average 8 inch minimum height; 10% annually rotated refuge area located away from edges ; haying less than 50% of paddocks according to wildlife friendly haying plan; a diversity of forage species including both warm (minimum 5 % of stand) and cool season grasses; and a winter sacrifice area which will be reseeded.

MICHIGAN HABITAT INDEX WORKSHEET

GRASSLAND[1]

Participant _____ Tract No. _____ Date _____ Field No. _____

Observer _____ Acres _____

GRASSLAND HABITAT INDEX	POINTS	EXISTING	PLANNED
1. Species Composition (Diversity)		_____	_____
2 points for each common[2] grass species and 2 points for each common forb or broadleaf species with a maximum total of 14 points.			
2. Presence of Bare Ground			
> 40% bare ground/light litter	0	_____	_____
30-39% bare ground/light litter	5	_____	_____
10-29% bare ground/light litter	10	_____	_____
1-9% bare ground/light litter	5	_____	_____
< 1% bare ground/light litter	0	_____	_____
3. Average Field Size			
> 40 acres	10	_____	_____
20-40 acres	8	_____	_____
5-19 acres	4	_____	_____
< 5 acres	0	_____	_____
4. Abundance of Grasslands Within 1 Mile Radius			
Comprises >25% of area	10	_____	_____
Comprises 11-25% of area	7	_____	_____
Comprises 1-10% of area	3	_____	_____
Comprises <1% of area	0	_____	_____

GRASSLAND HABITAT INDEX	POINTS	EXISTING	PLANNED
5. Undesirable Vegetation			
Less than 10% of the area covered by undesirable plant species for wildlife (tall fescue, smooth brome, common reed, reed canary grass, or noxious weeds).	10	_____	_____
Less than or equal to 20% of the area covered by undesirable plant species for wildlife (tall fescue, smooth brome, common reed, reedcanary grass, or noxious weeds).	5	_____	_____
Greater than 20% of the area covered by undesirable plant species for wildlife (tall fescue, smooth brome, common reed, reed canary grass, or noxious weeds).	0	_____	_____
(A) TOTAL GRASSLAND HABITAT POINTS (54 MAX.)		_____	_____
(B) GRASSLAND HABITAT INDEX (A/54)		_____	_____

1. Includes abandoned cropland, unmanaged idle grasslands, or other such as CRP or WRP. Areas where woody vegetation exceeds 2% of the area should use the shrub or woodland worksheet.
2. Common is defined as comprising at least 10% of the stand.

HABITAT INDEX WORKSHEET

WETLAND[1]

Participant _____ Tract No. _____ Date _____ Field No. _____

Observer _____ Acres _____

WETLAND HABITAT INDEX	POINTS	EXISTING	PLANNED
1. Plant Community (Diversity)		_____	_____
2 points for each herbaceous plant species which comprises at least 5% of stand in a herbaceous wetland and 2 points for each woody species which comprises at least 5% of the stand in a shrub or forested wetland with a maximum total of 14 points.			
2. Percent Open Water Throughout Majority of the Year			
> 71%	3	_____	_____
51-70%	10	_____	_____
30-50%	7	_____	_____
10-30%	5	_____	_____
5-10%	2	_____	_____
< 5%	0	_____	_____
3. Upland Buffers (Average Width)		_____	_____
Calculate by the following: % of wetland edge (expressed as a decimal) with a buffer times the average width of the buffer in feet (maximum 60 feet) divided by 6 with a maximum total of 10 points.			
4. Presence of Invasive Species - Including phragmities, reed canarygrass, glossy buckthorn, and purple loosestrife			
Percent of the wetland with invasive plants:			
0-5%	10	_____	_____
6-10%	7	_____	_____
11-15%	4	_____	_____
> 15%	0	_____	_____

WETLAND HABITAT INDEX	POINTS	EXISTING	PLANNED
5. Landscape Significance			
> 40 acres of wetland w/i ½ mile	10	_____	_____
> 40 acres of wetland w/i 1 mile	6	_____	_____
> 40 acres of wetland w/i 1½ mile	4	_____	_____
6. Livestock Use			
Uncontrolled livestock access	0	_____	_____
Limited access or light use	4	_____	_____
Livestock excluded	10	_____	_____
7. Adjacent Grass to Wetland Buffer Ratio			
5:1 or greater	10	_____	_____
4:1	8	_____	_____
3:1	6	_____	_____
2:1	4	_____	_____
1:1	2	_____	_____
< 1:1	0		
(A) TOTAL WETLAND HABITAT POINTS (74 MAX.)		_____	_____
(B) WETLAND HABITAT (A/74)		_____	_____

1. Evaluate all hydric soil areas except PC areas which are considered cropland. However, unique wetlands such as bogs, fens, or sedge meadows do not need to be evaluated.

HABITAT INDEX WORKSHEET

SHRUBLAND

Participant _____ Tract No. _____ Date _____ Field No. _____

Observer _____ Acres _____

SHRUBLAND HABITAT INDEX	POINTS	EXISTING	PLANNED
1. Species Composition (Diversity)		_____	_____
2 points for each common[2] woody species and 1 point for each common grass or broadleaf species with a maximum total of 14 points.			
2. Openings - Percent of field in grass/forb openings:			
50-75%	3	_____	_____
25-50%	6	_____	_____
15-25%	10	_____	_____
5-15%	5	_____	_____
< 5% OR > 75%	0	_____	_____
3. Average Field Size			
> 40 acres	10	_____	_____
20-40 acres	8	_____	_____
5-20 acres	4	_____	_____
< 5 acres	0	_____	_____
4. Abundance of Shrubland Within 1 Mile Radius			
Comprises >25% of area	5	_____	_____
Comprises 11-25% of area	10	_____	_____
Comprises 1-10% of area	3	_____	_____
Comprises <1% of area	0	_____	_____

SHRUBLAND HABITAT INDEX	POINTS	EXISTING	PLANNED
5. Presence of Invasive Species - Percent of shrubland with invasive plants			
0-5%	10	_____	_____
6-10%	7	_____	_____
11-15%	4	_____	_____
> 15%	0	_____	_____
(A) TOTAL SHRUBLAND HABITAT POINTS (54 MAX.)		_____	_____
(B) SHRUBLAND HABITAT INDEX (A/54)		_____	_____

1. Includes abandoned cropland, unmanaged idle shrub, or other odd areas. Areas where woody vegetation exceeds 50% of the area should use the woodland worksheet.
2. Common is defined as comprising at least 10% of the stand.

MICHIGAN WILDLIFE HABITAT EVALUATION SUMMARY

Participant _____ Tract No. _____ Date _____ Field No. _____

Observer _____ Acres _____

EXISTING CONDITION

Habitat Type	Habitat Index		Acres		Weighted Index	CTU
Cropland	_____	x	_____	=	_____	
Woodland	_____	x	_____	=	_____	
Pastureland/Hayland	_____	x	_____	=	_____	
Grassland	_____	x	_____	=	_____	
Shrubland	_____	x	_____	=	_____	
Wetland	_____	x	_____	=	_____	
	SUM TOTALS		_____		_____	

TOTAL WEIGHTED INDEX/TOTAL ACRES _____

PLANNED CONDITION

Habitat Type	Habitat Index		Acres		Weighted Index	CTU
Cropland	_____	x	_____	=	_____	
Woodland	_____	x	_____	=	_____	
Pastureland/Hayland	_____	x	_____	=	_____	
Grassland	_____	x	_____	=	_____	
Shrubland	_____	x	_____	=	_____	
Wetland	_____	x	_____	=	_____	
	SUM TOTALS		_____		_____	

TOTAL WEIGHTED INDEX/TOTAL ACRES _____

Note: In general, a habitat index below 0.3 indicates poor habitat, between 0.3 and 0.49 indicates fair habitat, between 0.5 and 0.75 is good habitat, and above 0.75 would be considered excellent habitat.