Multiple Species Inventory and Monitoring Program

Final Report – 2011

Grant number T-6-R-3

The Iowa Multiple Species Inventory & Monitoring (MSIM) program began in 2007 on public lands with one crew responsible for 16 properties in central Iowa. In 2008, the program expanded to 2 crews, covering 29 new properties divided between southeastern Iowa and south-central Iowa. The program continues to grow toward our goal of having 5 crews cover approximately 75 properties each year. In 2011, we achieved our coverage goal with 5 crews that covered 76 properties including 10 old properties that are surveyed annually and 63 new properties. Crews surveyed 14 new properties north-central Iowa (hereafter Clear Lake Area), 16 in south-central Iowa (hereafter Honey Creek Area), 9 in eastern Iowa along the Mississippi River (hereafter Mississippi River Area), 13 in east-central Iowa (hereafter Otter Creek Area), and 14 in northeast Iowa (hereafter Sweet Marsh Area; see Figure 1).
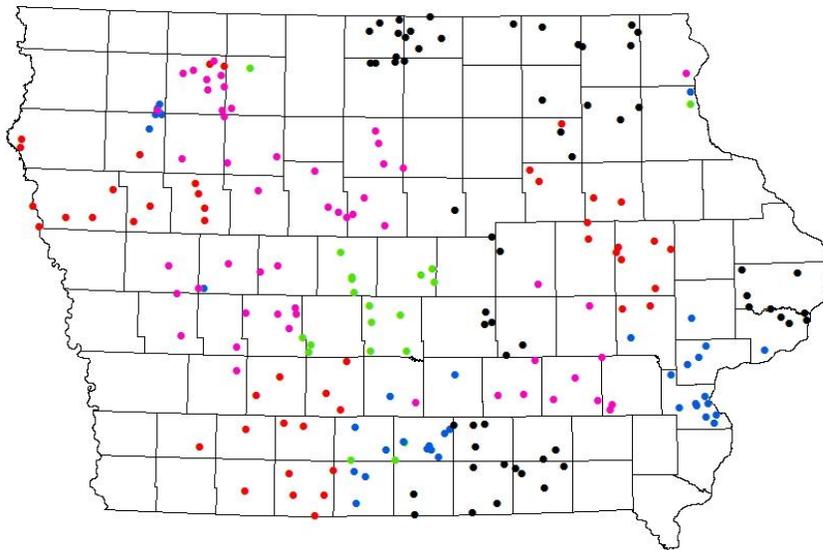

Figure 1: Properties surveyed under the Iowa Multiple Species Inventory and Monitoring Program, 2007-2011. Green = 2007 properties, blue = 2008 properties, red = 2009 properties, pink = 2010 properties, and black = 2011 properties.

The specific goals for T-6-R-3 include:

1. Conduct MSIM surveys on 74 properties in 2011. Five crews will be assigned to the counties below (areas to be surveyed are denoted by black dots in Figure 1):
    a. Crew 1: Hancock, Winnebago, Cerro Gordo, and Worth
    b. Crew 2: Mitchell, Howard, Chickasaw, Bremer, Winneshiek, and Fayette
    c. Crew 3: Hardin, Grundy, Tama, Poweshiek, Jasper, and Keokuk

d. Crew 4: Clinton and Scott
e. Crew 5: Appanoose, Monroe, Wayne, Davis, and Wapello

Note: Properties surveyed annually will be assigned to crews covering the above counties even though annually-surveyed properties are in counties not listed above.

2. Enter data collected into the MSIM online database.
3. Submit county occurrence records to the appropriate Iowa Wildlife Action Plan (IWAP) taxonomic subcommittee.
4. Provide additional information to IWAP taxonomic subcommittees as requested and change database records as advised.
5. For a subset of species, conduct appropriate preliminary analyses including those to determine:
    a. What proportion of sampled habitat is occupied by a given species? What are the detection probabilities for each species? For this we will use the Proportion of Area Occupied Methodology of MacKenzie et al. (2002) to determine the probability of site occupancy, probability of colonization, probability of extinction, and the probability of an observer detecting the species.
    b. What is the spatial distribution of occupancy based upon these sites? Are there any unexpected gaps in species of occurrence from a strictly spatial perspective? For this we will compare data to that found in Iowa Gap and historical species accounts to determine whether species have been lost from specific areas or added as county records.
    c. What are the physical and biological attributes of sampled sites? Data collected on physical and biological attributes of sites will allow us to refine estimates of the proportion of areas occupied through the use of covariates. In addition, we should be able to build logistic regression models for some species which would provide hypotheses for future management actions we could examine with adaptive management.

Progress on each objective is described below.

Objectives 1: Conduct MSIM surveys on 74 properties in 2011.

All properties for the MSIM Program were randomly chosen with a random number generator after being classified by property managers into one of 19 potential habitat classes as defined in the Iowa Wildlife Action Plan (IWAP). This selection process occurred in 2005. In 2011, we surveyed 66 new properties in the 23 counties listed above. Table 1 lists each property surveyed by name, the county in which it is located, the entity that owns the property, and the designated habitat type of the property. The 10 permanent sampling locations are listed at the end of the table and include: McCoy Wildlife Management Area (WMA) and Harrier Marsh, both of which have been surveyed annually since 2007, Cedar Bottoms WMA and DeKalb WMA which have been surveyed since 2008, Hawkeye WMA, Black

Hawk Marsh, and Mt. Ayr WMA which have been surveyed annually since 2009, and Lakin Slough WMA, Big Wall Lake, and Ocheyedan WMA which have been surveyed annually since 2010.

Table 1. Properties surveyed as part of MSIM Program in Iowa in 2011.

Property	County	Owner	Habitat Description
Crystal Hills WMA	Hancock	State	Warm Season Herbaceous Grasses
Eagle Lake Jason Pits Area	Hancock	Federal	Pond
Elk Creek Marsh	Worth	State	On-stream Impoundement
Gabrielson WMA	Hancock	State	Shrubland
Good Neighbors Marsh	Winnebago	State	Warm Season Herbaceous Grasses
Hanlontown Slough	Worth	Federal	Stream
Harmon Lake	Winnebago	State	Ag Land: Crop
Hogsback Marsh WMA	Winnebago	State	Herbaceous Wetland
Land of Two Waters	Worth	County	Stream
Panicum Prairie	Worth	County	Warm Season Herbaceous Grasses
Pilot Knob Recreation Area	Winnebago	State	Ag Land: Cool Season Grass
Rice Lake WMA	Worth	State	Shallow Lake
Sandpiper Hills	Cerro Gordo	State	Ag Land: Crop
Wood Duck Marsh	Winnebago	State	Ag Land: Cool Season Grass
Bobwhite State Park	Wayne	State	Ag Land: Cool Season Grass
Eldon WMA	Davis	State	Ag Land: Crop
Fox Hills WMA	Wapello	State	Warm Season Herbaceous Grasses
Honey Creek State Park	Appanoose	State	Shrubland
La Hart WMA	Monroe	State	Shrubland
Lake Wapello State Park	Davis	State	Stream
McGowan WRA	Davis	County	Pond
Medicine Creek Wildlife Area	Wayne	County	Woodland
Miami Lake	Monroe	State	On-stream Impoundement
Pioneer Ridge	Wapello	County	Pond
Ross WA	Appanoose	County	Pond
Sedan Bottoms WMA	Appanoose	State	Stream
Soap Creek WMA	Davis	State	Wet Forest/Woodland
Thousand Acres_SSF	Monroe	State	Forest
Tubaugh WMA	Appanoose	State	Stream
Tyrone WMA	Monroe	State	Ag Land: Crop
Hayesville Bend WMA	Keokuk	State	Wet Forest/Woodland
Otter Creek WMA	Tama	State	On-stream Impoundement
South Skunk Access	Keokuk	State	Oxbow
Barber Creek Area	Clinton	State	Wet Shrubland
Ben Martinson Area	Clinton	County	Wet Forest/Woodland
Goose Lake_Clinton County	Clinton	State	Wet Shrubland
Lost Grove Lake	Scott	State	On-stream Impoundement
Lost Nation Public Hunting Area	Clinton	County	On-stream Impoundement
Princeton WMA	Scott	State	Ag Land: Cool Season Grass
Scott County Park	Scott	County	Warm Season Herbaceous Grasses

Table 1 continued. Properties surveyed as part of MSIM Program in Iowa in 2011.

Property	County	Owner	Habitat Description
Sherman Park	Clinton	County	Savanna
Syracuse WMA	Clinton	State	Wet Shrubland
Fox Forest Area	Poweshiek	County	Creek
Jacob Krumm Nature Preserve	Jasper	County	Lake
Millgrove Access	Poweshiek	County	River
Pine Lake State Park	Hardin	State	Ag Land: Cool Season Grass
Reichlelt Unit of Rock Creek State Park	Jasper	State	Creek
Rock Creek WMA	Jasper	State	Stream
Union Grove State Park	Tama	State	Lake
Wolf Creek Recreation Area	Grundy	County	Stream
Aldo Leopold WMA	Bremer	State	Warm Season Herbaceous Grasses
Cardinal Marsh	Winneshiek	State	Savanna
Gilbertson Conservation Area	Fayette	County	Pond
Hayden Prairie State Preserve	Howard	State	Warm Season Herbaceous Grasses
North & South Bear Complex	Winneshiek	State	Forest
Pine Creek	Winneshiek	State	Oxbow
Pinicon Alders	Mitchell	County	River
Sweet Marsh WMA	Bremer	State	River
Thelman WA	Fayette	County	Creek
Turkey River WMA	Howard	State	River
Twin Ponds	Chickasaw	County	Pond
Upper Iowa Accesses	Winneshiek	State	On-stream Impoundement
Volga River State Park	Fayette	State	Shrubland
Rinehart Tract Iowa River Corridor	Tama	Federal	Other
Colfax WMA - 5 eyes tract	Jasper	State	Backwater
Plum Creek WA	Bremer	County	Herbaceous Wetland
*Cedar Bottoms WMA	Muscatine	State	Herbaceous Wetland
*Harrier Marsh	Boone	State	Warm Season Herbaceous Grasses
*McCoy WA	Boone	State	Pond
*Ocheyedan WMA	Clay	State	Backwater
*Black Hawk Marsh	Sac	State	Shrubland
*Big Wall Lake	Wright	State	Lake
*Dekalb WMA	Decatur	State	Creek
*Lakin Slough WMA	Guthrie	State	Wet Shrubland
*Mt. Ayr WMA	Ringgold	State	Shallow Lake
*Hawkeye Wildlife Area	Johnson	State	Oxbow

*Indicates a permanent sampling property, surveyed annually.

In 2011, these properties were surveyed for birds, mammals, amphibians, reptiles, odonates, and butterflies. The tables in the appendix at the end of this report list the species seen at each property during 2011. The number of bird species seen in 2011 ranged from 42 at Eagle Lake – Jason Pits Area to 126 at Union Grove State Park, with an average of 80 species observed per property. One property, Ben Martinson Area, received severe flooding in 2011 and was not surveyed for birds.

Therefore, this property was removed from the table. Fox Forest Area had the highest number of bird SGCN with 30 species, while Hawkeye Wildlife Area had the fewest SGCN with 2 species. Appendices 1 – 6 contain the tables of bird species found on properties surveyed in 2011.

The number of mammal species ranged from 3 at McCoy Wildlife Area to 16 at Harmon Lake WMA. All together 5 SGCN mammal species were documented: Least Shrew at 2 properties, Prairie Vole at 2 properties, Woodland Vole at 1 property, River Otter at 10 properties, and Bobcat at 14 properties. Five properties contained 2 SGCN species including Medicine Creek Wildlife Area, Millgrove Access, Otter Creek WMA, Rhinehart Tract of the Iowa River Corridor, and Sedan Bottoms WMA. Appendices 7 – 12 contain the tables of mammal species found on properties surveyed in 2011.

Eldon WMA had the most documented amphibian and reptile species with 18. Both Crystal Hills WMA and Hogsback Marsh WMA had the fewest documented amphibian and reptile species with 6. An average of 11 herpetofauna species were observed per property in 2011. Seven properties had 3 SGCN species including Cedar Bottoms WMA, Jacob Krumm Nature Preserve, Medicine Creek Wildlife Area, Panicum Prairie, Pioneer Ridge, Sherman Park, and Thousand Acres Unit of Stephens State Forest. Appendices 13 – 18 contain the tables of herpetofauna species found on properties surveyed in 2011.

Both Eldon WMA and Sedan Bottoms WMA had the most odonate species with 44. Lost Nation Public Hunting Area had the fewest documented odonate species with 10. An average of 24 species of odonates were observed per property in 2011. Pioneer Ridge had the most documented SGCN species with 5, and several properties had only 1 or no SGCN species documented. Appendices 19 – 24 contain tables of odonate species documented on properties surveyed in 2011.

Tyrone WMA had the most documented butterfly species with 50, while both Ben Martinson Area and Elk Creek Marsh had the fewest documented species at 7. 4 SGCN species were documented at both Lake Wapello State Park and Thousand Acres Unit of Stephens State Forest. Appendices 25 – 30 have tables of butterfly species found on properties surveyed in 2011.

2011 was the first year that we implemented our survey protocol for fish in wadeable streams and rivers and non-wadeable rivers. We implemented backpack electrofishing protocols at properties that contained a wadeable stream or river. We also implemented trawling protocols on properties that contained a non-wadeable river. At this time, we are still working on organizing this data and plan to soon have a list of species found during 2011.

Objective 2: Enter data collected into the MSIM online database.

Currently, we have all data collected in the field through the 2011 season entered into the online database. The database currently contains just over one million records made up of species data as well as terrestrial and aquatic habitat data.

Objective 3: Submit county occurrence records to the appropriate Iowa Wildlife Action Plan (IWAP) taxonomic subcommittee.

Once all faunal data has been entered into the database for a given year, county lists are produced for each taxonomic group. These lists are then sent to the Iowa Wildlife Action Plan Taxonomic Subcommittee Chairs (birds – Dr. Stephen Dinsmore, herpetofauna – Mr. Jeff LeClere, mammals – Mr. Daryl Howell and Dr. Rick Lampe, fish – Dr. Clay Pierce, mussels –Ms. Kelly Poole and Dr. Kevin Roe , odonates – Mr. Steve Hummel, butterflies – Ms. Stephanie Shepherd, snails –Dr. Kevin Roe). We currently have not sent any information to the fish, mussel, or snail committee chairs through the 2011 season. Each chair has the option of forwarding our list to the committee or reviewing it themselves. In either case, they flag the species that are unusual or represent new county records. We then go back to the original data sheets and determine whether there was a data entry error or whether the record was entered legitimately.

Objective 4: Provide additional information to IWAP taxonomic subcommittees as requested and change database records as advised.

After submitting species lists to the appropriate subcommittees and receiving flagged records back from the respective committee, we determine if the record is legitimate by checking it against the data sheets and verifying the record was not the result of an entry error. If the record is determined legitimate, additional information is requested by the respective taxonomic subcommittee. We provide the requested information to the committee and the information provided is specific to each committee (e.g. the reptiles and amphibians subcommittee requests photo vouchers for each record whereas the bird subcommittee requests additional information such as date, location, and observer). Any records deemed unacceptable by the committees are then changed to 'unknown species' in the database with a note as to what the original identification had been. Records have been provided to the bird subcommittee for the 2011 season and the additional information has been requested and provided. We are awaiting a response from the subcommittee regarding acceptable and unacceptable records. As we are still working on providing the extra information to other committees, we again stress that the information presented in this report should be considered preliminary for 2011.

Objective 5: For a subset of species, conduct appropriate preliminary analyses including those to determine:

a. What proportion of sampled habitat is occupied by a given species? What are the detection probabilities for each species? For this we will use the Proportion of Area Occupied Methodology of MacKenzie et al. (2002) to determine the probability of site occupancy, probability of colonization, probability of extinction, and the probability of an observer detecting the species.

We are just getting started on these analyses and plan on full, in-depth analyses in 2014 after all counties in Iowa have a representative property included. The tables below offer a sample of information yet to come. We evaluated the parameters mentioned above (probability of site occupancy, probability of site colonization, probability of site extinction, and probability of detection) for four species of grassland birds, all of which are SGCN. Those species are Sedge Wren, Grasshopper Sparrow,

Dickcissel, and Eastern Meadowlark. Data collected from 2007-2011 were utilized in the models in order to obtain the best estimates of each parameter. The information presented below should still be considered a first cut of the data as no covariates have been utilized in the analyses as of yet. Ψ represents the probability a site is occupied, γ represents the probability a site will be colonized, ε represents the probability a species will go extinct at a site, and p represents the probability of detection. All parameters were allowed to vary by year (one estimate for each year) and were held constant (no variability between years, denoted by a "." below). Ψ was held constant in all models. Eight models were evaluated for each species that included different combinations of variability in the parameters.

Table 2. Top model for each species.

Species	Model	Number of parameters
Sedge wren	p(year),ψ(.),ε(.),γ(year)	10
Grasshopper sparrow	p(year),ψ(.),ε(.),γ(.)	7
Dickcissel	p(year),ψ(.),ε(.),γ(.)	7
Eastern meadowlark	p(year),ψ(.),ε(.),γ(.)	7

Table 3. Occupancy estimates (ψ) for each species. Estimates were held constant in the models, so one estimate is shown for each species calculated from the top model.

Species	ψ
Sedge wren	62.8 (51.9 – 72.5)
Grasshopper sparrow	42.3 (30.7 – 54.8)
Dickcissel	59.9 (49.4 – 69.5)
Eastern meadowlark	55.0 (44.1 – 65.4)

Table 4. Colonization probabilities (γ) for each species. Estimates were obtained from the top model for each species, so they are presented as either constant across years or one estimate for each year. *Estimates are not reported for 2007 because sites are either colonized or not colonized at the start of sampling.

Species	γ2007	γ2008	γ2009	γ2010	γ2011
Sedge wren		11.8 (1.74 – 50.4)	30.7 (15.6 – 51.4)	29.4 (5.25 – 75.8)	0 (0.0 – 0.0)
Grasshopper sparrow		24.2 (12.5 – 41.7)			
Dickcissel		14.6 (7.31 – 27.1)			
Eastern meadowlark		25.4 (14.5 – 40.5)			

Table 5. Extinction probabilities for each species. Estimates were obtained from the top model for each species, so they are presented as either constant across years or one estimate for each year. *Estimates are not reported for 2011 because extinction from years 2011-2012 cannot be estimated without data from 2012.

Species	ε2007	ε2008	ε2009	ε2010	ε2011
Sedge Wren	15.8 (7.38 – 30.8)				
Grasshopper sparrow	18.5 (8.65 – 35.5)				
Dickcissel	14.0 (5.90 – 29.9)				
Eastern meadowlark	25.3 (13.3 – 42.7)				

Table 6. Detection probabilities for each species. Estimates were obtained from the top model for each species, so they are presented as either constant across years or one estimate for each year.

Species	p2007	p2008	p2009	p2010	p2011
Sedge Wren	47.7 (42.7 – 52.7)	49.7 (45.3 – 54.1)	48.4 (44.4 – 52.5)	49.9 (44.4 – 55.5)	27.9 (22.5 – 33.9)
Grasshopper sparrow	23.9 (17.8 – 31.3)	34.8 (30.2 – 39.6)	35.2 (30.8 – 39.9)	21.4 (16.9 – 26.7)	21.4 (16.9 – 26.7)
Dickcissel	33.3 (28.3 – 38.7)	21.3 (17.4 – 25.7)	36.8 (32.9 – 40.9)	26.8 (23.0 – 30.9)	26.8 (23.0 – 41.1)
Eastern meadowlark	34.1 (28.7 – 39.9)	36.6 (32.0 – 41.4)	50.7 (46.4 – 55.1)	39.3 (35.1 – 43.7)	38.7 (34.3 – 42.6)

b. What are the physical and biological attributes of sampled sites? Data collected on physical and biological attributes of sites will allow us to refine estimates of the proportion of areas occupied through the use of covariates. In addition, we should be able to build logistic regression models for some species which would provide hypotheses for future management actions we could examine with adaptive management.

We conduct assessments of both the terrestrial and aquatic habitat on each property surveyed by MSIM. For the terrestrial habitat assessment, we measure characteristics such as ground cover, litter depth, vegetation structure, canopy cover, coarse woody debris, and plant species diversity at each of seven points within the 10-hectare sampling hexagon. For the aquatic habitat assessment, we consider both lentic and lotic systems within each property surveyed. For lentic habitats, we measure maximum water depth, water depth at a point within the plot that is furthest from shore, and also measure percent cover of seven different substrate types at 30 plots established within 3m of the shoreline. Substrate types include bedrock, rubble (contains stones, boulders,

and bedrock), cobble-gravel (2-300mm in size), sand, mud (silt or clay),organic (muck or peat), and vegetation. For lotic habitats, we establish 11 transects 0.25m wide along the length of the stream surveyed by MSIM. Within these transects, we determine the channel type, measure the wetted width (width of water), bank-full width (the width of the channel at which point water would flow into the floodplain), bank-full height (how deep the water can get before flooding), incised height (depth of the incision of the channel), stream discharge, water temperature, water pH, and conductivity. Below is a table that provides summary statistics for two variables measured under the terrestrial habitat protocol; litter depth and ground cover. This is only a snapshot of the data collected on terrestrial habitats at surveyed properties. This information, along with other biological information collected on each property, will be used in future analyses to evaluate habitat associations of different species in order to provide recommendations on habitat management activities.

Table 7: Average percent ground cover of six substrate types and litter depth (cm) at properties surveyed by MSIM from 2007-2011. * denotes properties surveyed during 2011.

	Average Percent Ground Cover						
Property	Litter	Wood	Rock	Soil/ Sand	Vegetation	Water	Litter depth (cm)
Aldo Leopold WMA	16	0	0	2	81	0	4
Barber Creek Area	46	0	0	19	34	0	1
Big Wall Lake	6	0	0	2	68	25	2
Black Hawk WMA	9	0	2	19	65	6	1
Bobwhite State Park	19	0	0	5	76	0	1
Cardinal Marsh	24	0	0	7	68	0	3
Cedar Bottoms WMA	7	0	0	1	58	30	2
Colfax WMA - 5 eyes tract	13	0	0	9	77	0	2
Crystal Hills WMA	10	0	0	0	90	0	6
Dekalb WMA	12	0	3	11	49	25	1
Eagle Lake Jason Pits Area	8	0	0	1	91	0	7
Eldon WMA	19	0	0	15	66	0	1
Elk Creek Marsh	26	0	0	2	71	0	2
Fox Forest Area	27	0	0	5	68	0	5
Fox Hills WMA	42	0	0	6	52	0	2
Gabrielson WMA	22	1	0	31	45	0	2
Gilbertson Conservation Area	26	0	1	11	62	0	3
Good Neighbors Marsh	13	0	0	2	83	0	7
Goose Lake_Clinton County	9	0	0	1	79	11	1
Hanlontown Slough	9	0	0	0	90	0	6
Harmon Lake	11	0	0	2	88	0	7
Harrier Marsh	14	0	0	9	50	28	4
Hawkeye Wildlife Area	8	0	2	40	53	3	1
Hayden Prairie State Preserve	6	0	0	0	94	0	2
Hayesville Bend WMA	18	0	0	43	39	0	1
Hogsback Marsh WMA	16	0	3	0	81	0	3
Honey Creek State Park	27	0	0	2	70	0	2
Jacob Krumm Nature Preserve	15	0	0	2	75	8	5
La Hart WMA	36	0	0	10	54	0	1
Lake Wapello State Park	28	1	7	6	44	14	1
Land of Two Waters	15	0	0	8	77	0	3
Lost Grove Lake	11	0	0	19	70	0	2
Lost Nation Public Hunting Area	18	0	0	9	73	0	2
McGowan WRA	13	0	0	15	72	0	1
Medicine Creek Wildlife Area	10	0	0	2	87	0	1

Table 7: Average percent ground cover of six substrate types and litter depth (cm) at properties surveyed by MSIM from 2007-2011. * denotes properties surveyed during 2011.

| | Average Percent Ground Cover | | | | | | |
Property	Litter	Wood	Rock	Soil/ Sand	Vegetation	Water	Litter depth (cm)
Miami Lake	42	3	0	6	49	0	2
Millgrove Access	19	0	0	23	60	0	10
Mt. Ayr WMA	31	0	0	21	48	0	3
North & South Bear Complex	43	0	0	23	26	8	2
Ocheyedan WMA	8	0	0	5	81	6	2
Otter Creek WMA	11	0	0	1	81	7	14
Panicum Prairie	2	0	0	2	96	0	3
Pilot Knob Recreation Area	24	2	0	15	60	0	2
Pine Creek	25	0	1	12	63	0	2
Pine Lake State Park	23	0	2	9	59	5	6
Pinicon Alders	13	0	0	39	43	0	2
Pioneer Ridge	33	0	0	12	53	1	1
Plum Creek WA	21	0	0	8	69	1	7
Princeton WMA	25	0	0	18	50	7	1
Reichlelt Unit of Rock Creek State Park	29	0	0	3	68	0	3
Rice Lake WMA	25	0	0	27	48	0	2
Rinehart Tract Iowa River Corridor	33	0	0	5	36	18	4
Rock Creek WMA	22	0	0	2	75	0	16
Ross WA	23	0	0	3	75	0	2
Sandpiper Hills	13	0	0	0	74	13	4
Scott County Park	12	2	0	13	73	0	1
Sedan Bottoms WMA	8	0	0	2	90	0	1
Sherman Park	77	0	0	2	22	0	3
Soap Creek WMA	17	0	0	14	69	0	2
South Skunk Access	25	0	0	29	46	0	2
Sweet Marsh WMA	17	0	0	31	48	4	2
Syracuse WMA	28	0	0	15	57	0	2
Thelman WA	12	0	0	16	69	3	3
Thousand Acres_SSF	64	0	0	5	30	0	3
Tubaugh WMA	13	0	0	31	56	0	1
Turkey River WMA	18	0	5	23	51	0	3
Twin Ponds	23	0	0	25	46	6	2
Tyrone WMA	20	0	0	24	56	0	1
Union Grove State Park	20	0	0	10	63	3	5
Upper Iowa Accesses	31	0	0	11	47	9	3
Volga River State Park	19	0	0	16	65	0	7
Wolf Creek Recreation Area	21	0	0	13	63	0	5
Wood Duck Marsh	13	0	0	11	70	3	3